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STANDING COMMITTEE ON ENERGY

(2014-15)

SIXTEENTH LOK SABHA

MINISTRY OF POWER

ENERGY CONSERVATION

SEVENTH REPORT



**LOK SABHA SECRETARIAT
NEW DELHI**

August, 2015/Sravana, 1937 (Saka)

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STANDING COMMITTEE ON ENERGY
(2014-15)

(SIXTEENTH LOK SABHA)

MINISTRY OF POWER

ENERGY CONSERVATION

Presented to Lok Sabha on 11.08.2015

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LOK SABHA SECRETARIAT
NEW DELHI

August, 2015/Sravana, 1937 (Saka)

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COMPOSITION OF THE STANDING COMMITTEE ON ENERGY

(2014-15)

LOK SABHA

Dr. Kirit Somaiya - Chairperson

2. Shri Om Birla
3. Shri M. Chandrakasi
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5. Shri Harish Chandra alias Harish Dwivedi
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7. Shri Saumitra Khan
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17. Shri Gutha Sukender Reddy
18. Shri Purno Agitok Sangma
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RAJYA SABHA

22. Shri V.P. Singh Badnore
23. Shri Oscar Fernandes
24. Shri Ram Jethmalani
25. Shri Pyarimohan Mohapatra

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26. Shri S.Muthukaruppan
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SECRETARIAT

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| 1. | Shri K. Vijaykrishnan | Additional Secretary |
| 2. | Shri N.K. Pandey | Director |
| 3. | Smt. L.Nemjalhing Haokip | Under Secretary |
| 4. | Shri Manish Kumar | Committee Assistant |

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INTRODUCTION

I, the Chairperson, Standing Committee on Energy having been authorized by the Committee to present the Report on their behalf, do present this Report on Energy Conservation.

2. The Committee had extensive consultation with various stakeholders viz. Ministries of Power [including Bureau of Energy Efficiency (BEE) and Energy Efficiency Services Ltd. (EESL)], Finance, Corporate Affairs, Housing and Urban Poverty Alleviation, State Governments of Andhra Pradesh, Maharashtra and Uttar Pradesh, Regulators – Central Electricity Regulatory Commission (CERC), Delhi Electricity Regulatory Commission (DERC), Industry Forums –, Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce and Industry (FICCI), Private Manufacturing Associations/Companies – The Electrical Lamp and Component Manufacturers Association (ELCOMA), The Confederation of Real Estate Developers Association of India (CREDAI), Refrigeration and Air Conditioning Manufacturers Association (RAMA), BSES and TATA Power. The Committee also undertook a local study visit to an LED bulb manufacturing plant in Noida, UP.

3. Energy Conservation project not only recovers their upfront cost but result in substantive saving through energy saving over the period of time. However, this upfront payment is one of the deterrents in implementation of Energy Conservation programmes in the Country. Therefore, the role of Energy Service Companies (ESCO) becomes crucial in this regard.

4. The Committee focused on three broad sectors viz. Industry, Buildings (residential and commercial) and Agriculture. After the series of discussion and consultation, the Committee found that there is immense scope of energy conservation, which would not only result in substantive saving but also be helpful in bridging the gap between energy requirement and its supply in the Country. The observations/recommendations, suggested by the Committee in this regard are given in the following chapter.

(iv)

5. The Report was considered and adopted by the Committee at their sitting held on **5th August, 2015.**

6. The Committee wishes to express their thanks to the officers of the Ministry of Power for valuable assistance.

NEW DELHI
10th August, 2015
Shravana 19, 1937 (Saka)

DR. KIRIT SOMAIYA
Chairperson
Standing Committee on Energy

(v)

Observations/Recommendations of the Committee in brief

The Energy Efficiency and Energy Conservation both goes together. The Conservation and efficiency efforts additional investment which can be used for furtherance of energy development or for the other developments.

- Cooperation of all the stakeholders must.
- Need to evolve target for major important sector.
- Efficiency in construction of residential buildings, commercial complexes, encouragement to green buildings.
- Special efforts to bring efficiency in use of energy instrument in agriculture.
- Better, renewal energy in the operation of agriculture pumps.

Recommendations

1. Major campaign by Ministry, Power PSUs, DISCOMs and also industries involvement in power sector be asked to draft and implement major awareness campaign on 'Energy Efficiency and Energy Conservation'.
2. With the help of consumer efforts, Ministry of Power and the Ministry of Urban Development jointly evolve energy conservation guidelines i.e. Energy Conservation Building Code which should become part of National Building Code.
3. Action Plan for the improvement of millions of operating agriculture pump sets, road map to convert the agriculture pump sets into solar agriculture pump sets.
4. Guidelines for implementation of energy efficiency measures in:
 - All the residential complexes above – Sq. Meters.
 - All Malls, multiplexes should have energy efficiency plan/Programme.
 - Local Bodies be asked to make cooperation and make it mandatory in the building plan guideline to implement energy efficiency guideline.
 - The Ministry with the help of Industry Ministry must prepare special energy efficiency guideline/code for all the major industries.
 - Energy efficiency code for small cities.
 - Special encouragement/incentive for green buildings.
5. A study may be undertaken to include few more industries in the compulsory energy efficiency list.

6. Since last 25 years, companies are publishing/releasing measures/data on energy efficiency measures taken by the company in the Annual Report. Need to analyse the data.
7. The Ministry should prepare guideline and fix responsibility on an agency to study/scrutinize the energy efficiency measures taken by the companies which are reported in their Annual Reports. Such data could be useful for planning and correcting the policies.
8. Energy Audit concept is implemented since the couple of years. There is need to review the execution of providing energy efficiency data in Audit Report by the companies and the implementation of energy audit concept.
9. The Committee has observed that a lot of scope to improve both the above concepts, the Ministry with the help of Corporate Ministry and CERC, CEA can refresh the guideline and also evolve system to scrutinize and use such data.
10. The Committee also feels the observations made in the energy audit and also in the data released in the Annual Report by an Authority. It seems presently no system is evolved to analyze the data and act upon the same.
11. The Street Lights concept is 100 year old. The Technology used is also needs to modernize recent initiative of the Power Ministry to convert street lights into LED based Street Lights, needs in-depth study and action plan.
12. The present initiative of the Ministry to encourage/motivate the LED technology is appreciable. The Government after in-depth study must plan an action plan to use the LED technology in different schemes including residential.
13. Various suggestions/observations have been received from the Manufacturers, distributors, DISCOMs regarding implementation of LED technology in India must be considered by the Power Ministry and take necessary action.
14. The Power Ministry may take up with the Finance Ministry to declare the conversion of Street Lights into LED based Street Lights Project into Infrastructure Project.
15. Though AT&C losses are separate subject. The Committee feels steps require to bring down the commercial 'pilferage'.

REPORT
PART I
NARRATION ANALYSIS

CHAPTER I

Introductory

1.1 In view of the importance of energy efficiency and energy conservation, and of the cost-effective potential to implement it, the Parliamentary Standing Committee on Energy assessed the present situation and challenges in this sector in a series of meetings. During these Meetings, they held discussions with a wide range of stakeholders such as Ministries/Departments; regulators; State Governments; utilities; industry bodies; manufacturers, etc., and sought their views on opportunities and challenges to accelerate energy efficiency and energy conservation activities.

1.2 The Ministry of Power and the Bureau of Energy Efficiency have been assessing strategies to accelerate the pace of energy efficiency gains, including through the incorporation of energy efficiency enhancement actions as an integral part of the state-specific 24 x 7 Power-for-All plans that are currently under preparation.

1.3 Energy efficiency resources (i.e. energy savings) can be acquired in short gestation periods and the investments required for a MW of energy savings is only 20-30% that of the installation of a billion units (BU) of energy with the co-benefit of the reduction of greenhouse gas emissions.

1.4 The total electricity consumption during 2014-15 was 916 billion units (BU). The Table below shows the actual savings achieved in 2012-13, 2013-14, and 2014-15:

(All Figures are in Billion Units)

S.No	Component	2012-13	2013-14	2014-15
1.	Incremental Savings	7.68	7.73	9.17
2.	Total Savings (considering the energy saving activities during the 5 years)	60.85	57.3	59.38
3.	% of total electricity consumption	7.9	6.8	6.4

1.5 The accelerated pace of energy savings would be achieved by a mixture of aggressive policy and regulatory actions, market-based interventions (so as to create a market of energy efficiency business models), and enhanced outreach (so as to bring awareness about energy efficiency opportunities to energy consumers).

1.6 As a result of the interventions brought out, the expected savings in the target sectors are:

Focus Areas	Savings in 2018 (BU)
Buildings	8.04
LED Lighting	46.975
Industries	49.17
Appliances	14.28
Agriculture	2.7
Total	121.165 BU

1.7 As per the Ministry's report, the primary energy demand in India has grown from about 450 million tons of oil equivalent (toe) in 2000 to about 770 million toe in 2012. This is expected to increase to somewhere between 1250 (estimated by International Energy Agency) and 1500 (estimated in the Integrated Energy Policy Report) million toe by 2030. This increase is driven by a number of factors, the most important of which are increasing incomes and economic growth which lead to greater demand for energy services such as lighting, cooking, space cooling, mobility, industrial production, office automation, etc. This growth is also reflective of the current low level of energy supply in India: the average annual energy supply in India in 2011 was only 0.6 toe per capita whereas the global average was 1.88 toe per capita. It may also be noted that no country in the world has been able to achieve a Human Development Index of 0.9 or more without an annual energy supply of at least 4 toe per capita. Consequently, there is a large latent demand for energy services that needs to be fulfilled in order for people to have reasonable incomes and a decent quality of life.

1.8 The Government of India has undertaken a two-pronged approach to cater to the energy demands of the citizens while ensuring minimum growth in CO₂ emissions, so that the global emissions do not lead to an irreversible damage to the earth system. In the generation side, the Government is promoting greater use of renewable in the energy mix mainly through solar and wind and at the same time shifting towards supercritical technologies for coal based power plants. Efforts are also being made to

efficiently use energy in the demand side through various innovative policy measures under the overall ambit of the Energy Conservation Act 2001.

1.9 The Energy Conservation Act (EC Act) was enacted in 2001 with the goal of reducing energy intensity of the Indian economy. The Bureau of Energy Efficiency (BEE) was set up as a statutory body on 1st March 2002 at the central level to facilitate the implementation of the EC Act. The Act provides regulatory mandate for: standards & labeling of equipment and appliances; energy conservation building codes for commercial buildings; and energy consumption norms for energy intensive industries. The EC Act was amended in 2010 and the main amendments of the Act are given below

- The **Union** Government may issue energy savings certificate to the designated consumer whose energy consumption is less than the prescribed norms and standards in accordance with the procedure as may be prescribed.
- The designated consumer whose energy consumption is more than the prescribed norms and standards shall be entitled to purchase the energy savings certificate to comply with the prescribed norms and standards
- The **Union** Government may, in consultation with the Bureau, prescribe the value of per metric ton of oil equivalent of energy consumed
- Commercial buildings which are having a connected load of 100 kW or contract demand of 120 kVA and above come under the purview of ECBC under the EC Act.

1.10 The EC Act provides a legal framework for energy efficiency initiatives in the country and has mandatory and promotional initiatives which broadly relate to Designated Consumers, Standards and Labeling programme for equipment and appliances and Energy Conservation Building Code (ECBC) for new commercial buildings. The BEE is spearheading the task of improving energy efficiency in various sectors of the economy through regulatory and promotional mechanism. The Bureau also co-ordinates with designated consumers, designated agencies and other organizations recognizes and identifies and utilizes the existing resources and infrastructure in performing the functions assigned to it under the EC Act.

1.11 The Mission of the Bureau is to develop policy and strategies with a thrust on self-regulation and market principles, within the overall framework of the EC Act, 2001 with the primary objective of reducing energy intensity of the Indian economy. The strategies of the BEE to achieve the objective are :

- Coordinating policies and programmes on efficient use of energy and its conservation with the involvement of stakeholders.
- Planning, managing and implementing energy conservation programmes as envisaged in the EC Act.
- Assuming leadership and providing policy framework and direction to national energy efficiency and conservation efforts and programmes.
- Demonstrating energy efficiency delivery mechanisms, as envisaged in the EC Act, through Private-Public Partnership (PPP).
- Establishing payments and procedures to measure, monitor and verify energy efficiency results in individual sectors as well as at the national level.
- Leveraging multi-lateral, bilateral and private sector support in implementation of programmes and projects on efficient use of energy and its conservation.

1.12 The Ministry of Power, through the BEE, has initiated a number of energy efficiency initiatives in the areas of household lighting, commercial buildings, standards and labeling of appliances. and demand side management in agriculture/municipalities. These initiatives have resulted in an avoided capacity generation of 16968 MW as on March, 2015.

1.13 The BEE translates its mission into action through regulatory and promotion functions. These functions *inter-alia* include :

Regulatory

- Develop minimum energy consumption standards and labeling for equipment and appliances.
- Develop specific energy conservation building codes (ECBC).
- Activities focusing on designated consumers.
- Develop energy consumption norms.
- Certify energy managers and energy auditors.
- Accreditation of energy auditors.

- Define the manner and periodicity of mandatory energy audits.
- Develop reporting formats on energy consumption and action taken on the recommendations of the energy auditors.

Promotional

- Create awareness and disseminate information on energy efficiency and conservation.
- Arrange and organize training of personnel and specialists in the techniques for efficient use of energy and its conservation.
- Strengthen consultancy services.
- Promote research and development.
- Develop testing and certification procedures and promote testing facilities.
- Formulate and facilitate implementation of pilot projects and demonstration projects.
- Promote use of energy efficient processes, equipment, devices and systems.
- Take steps to encourage preferential treatment for use of energy efficient equipment or appliances.
- Promote innovative financing of energy efficient projects.
- Give financial assistance to institutions for promoting efficient use of energy and its conservation.
- Prepare educational curriculum on efficient use of energy and its conservation.
- Implement international co-operation programmes relating to efficient use of energy and its conservation.

1.14 The Bureau of Energy Efficiency has already launched the following voluntary and mandatory schemes for promoting Energy Efficiency in India during the XIIth Plan:

1. Bachat Lamp Yojana (BLY) Scheme
2. Standards and Labelling Scheme
3. Energy Conservation Building Codes (ECBCs)
4. Assistance on ECBC to different projects
5. Energy Efficiency in Existing Buildings
6. Accreditation of ESCOs
7. Agricultural (Ag DSM) and Municipal (Mu DSM) Demand Side Management Scheme
8. Strengthening Institutional Capacity of SDAs Scheme
9. Contribution to State Energy Conservation Fund (SECF) Scheme
10. National Energy Conservation Award, 2012
11. Painting Competition on Energy Conservation, 2012
12. National Certification Examination for Energy Managers & Energy Auditors

13. National Mission for Enhanced Energy Efficiency (NMEEE)
14. International Co-operation Programmes
15. Human Resource Development (HRD) Scheme
16. Energy Efficiency Research Centre for Energy Consuming Sectors.

1.15 The key objective of Standard & Labeling (S&L) programme is to provide the consumer an informed choice about energy consumption, and thereby the energy cost, of the product. The longer-time objective of the energy efficiency labeling program is to reduce the energy consumption of appliances, without diminishing the services they provide to consumers.

1.16 Presently, 21 equipment/appliances are covered under the labeling program, of which Room Air Conditioners, Fluorescent Tube Lights, Frost Free Refrigerators, and Distribution Transformers are under mandatory regime. The appliances namely Induction Motors, Direct Cool Refrigerator, electric storage type geyser, Ceiling fans, Color TVs, Agricultural pump sets, LPG stoves, Washing machine, Laptops, Ballast, Floor standing ACs, Office automation products, Diesel Generating sets, Diesel operating pump-sets, Solid state inverters, LED lamps & Variable speed (Inverter type) air conditioners are **presently** under the voluntary labeling phase. The energy efficiency labeling programs under BEE are intended to reduce the energy consumption of appliance without diminishing the services it provides to consumers.

1.17 Further, the standards and label for refrigerators and air-conditioners have been periodically made more stringent. As a result, the least-efficient products are removed from the market and more efficient products are introduced. The Corporate Average Fuel Consumption Standards (CAFC) for passenger cars **was** notified on 30th January, 2014. The most recent additions to the list of labeled products are Diesel Pumpsets & Diesel Generating Set.

1.18 Keeping in view that the transport sector has become one of the largest energy consuming sectors, the Corporate Average Fuel Consumption Standards (CAFC) for passenger cars has been notified on 23rd April, 2015.

1.19 From the wide ranging interaction that the Standing Committee had with stakeholders, the main areas of focus that emerged are: buildings, LED lighting, appliances, energy-intensive industries, agriculture, municipalities, strengthening of institutional arrangements, State Designated Agencies, Investment, Promotion and Integration with renewable energy and some other important aspects of energy conservation.

1.20 The Committee, during the discussion with various departments of the Government, came to know that different programmes on the subject are being implemented through diverse agencies which are under the administrative control of different Ministries/ Departments.

1.21 The interventions to enable the accelerated implementation of energy efficiency have been identified for each sector. These are grouped here for the purpose of consolidation and arranged according to the primary institution (Ministry/Department/Agency/ State Government) which would be enabling the intervention. Each of these interventions would be initiated by the Bureau of Energy Efficiency, and coordinated by the Bureau and the Ministry of Power.

Ministry of Power/ Bureau of Energy Efficiency -

- To include new sectors where energy audit is mandatory (newly designated consumer sectors)
- Institutional strengthening of BEE, SDAs, and EESL
- Link support under IPDS to the initiation of projects for changeover to LED streetlights
- Link support under the Deen Dayal Upadhyaya Gram Jyoti Yojana to the initiation of project for energy efficiency upgradation of agricultural pump-sets.
- Amendment of EC Act to include
 - (i) Energy Conservation Building Code for residential buildings; and
 - (ii) Inclusion of ULBs in the Schedule of EC Act listing Energy Intensive Industries and Establishments

Regulators – Central and State Electricity Regulatory Commission

- Enable and require DISCOMs to invest in energy efficiency demand side management projects

- Require DISCOMs to initiate LED programmes for households.

State Governments -

- Develop State-level action plans for implementing energy efficiency projects
- Establish SDAs as independent Directorates overseen by Committee of Secretaries headed by the Chief Secretary.

Ministry of Finance -

Department of Economic Affairs: Infrastructure status and priority sector - lending for energy-efficiency projects.

Department of Revenue/CBDT: Differential taxation for energy efficient products, with lower taxes for high-efficient products.

Department of Expenditure: Transparent criteria and allocation for energy efficiency projects to access the National Clean Energy Fund.

Ministry of Urban Development -

- Link support to States and ULBs under central urban development programmes to: (a) notification of Energy Conservation Building Code (include changing to LED streetlights)

Public Works Development:

- direct that all new buildings should be ECBC compliant; and
- upgrade energy-consuming fixtures in government buildings to bring down their energy consumption.

Ministry of Housing and Urban Poverty Alleviation –

- Issue guidelines for thermal comfort in design of low income housing
- Direction to financial institutions to follow thermal-comfort guidelines and BEE guidelines for multi-storey residential buildings, while providing housing loans.

Ministry of Consumer Affairs/Bureau of Indian Standards –

- Increase testing infrastructure for LEOs and other energy-efficient products and components. Partner in awareness campaign.

Department of Industrial Policy and Promotion -

- Provision of support for manufacturing of LED chips under Make in India programme

Ministry of Corporate Affairs -

- To issue guidelines for reporting of energy use and energy conservation in the Annual Reports of Companies.

CHAPTER II

Energy Conservation Building Code (ECBC)

2.1 The Energy Conservation Building Code (ECBC) was developed by the Government of India for new commercial buildings on 27th May, 2007. ECBC sets minimum energy standards for new commercial buildings having a connected load of 100kW or contract demand of 120 KVA and above. According to the Ministry of Power, while the Union Government has power under the EC Act 2001, the State Governments have the flexibility to modify the code to suit local or regional needs and notify them. Currently eight States and Union territories (Rajasthan, Odisha, UT of Puducherry, Uttarakhand, Punjab, Karnataka, Andhra Pradesh and Telangana) have notified and adopted the code for their States. The Bureau of Energy Efficiency has developed a voluntary Star Rating Programme for buildings which is based on the actual performance of a building, in terms of energy usage in the building over its area expressed in kWh/sq. m/year.

2.2 The buildings sector, comprising of residential and commercial, presently utilizes about 34% of the overall electricity consumption from utilities, of which 12% is in the commercial sector and 22% in residential buildings. The demand for energy in the buildings sector is expected to grow exponentially due to rapid urbanization and high demand for infrastructure and buildings. It is estimated that about 460 million sq.meters of real estate space will be added annually till 2020, predominantly in the residential sector. The electricity saving potential through the various interventions has been estimated as under:

Commercial Buildings	Saving potential	Instruments
• New	25 – 35%	Mandatory implementation of Building Codes (ECBC)
• Existing	10 – 15%	Energy efficiency upgrades through retrofits and Star Labeling
Residential Buildings	20%	Through appliance efficiency and passive design features

2.3 Action Plan of the Ministry to accelerate saving potential in 3 years under ECBC:

- All States to mandate ECBC with the objective that 75% of all new starts of commercial buildings are ECBC compliant by 2017.

- Establishment of ECBC Cells in State Urban Development Departments / PWDs to support and monitor progress.
- Revision of existing code to include building-integrated renewable and incorporate technological advancements to achieve Nearly Zero Energy Buildings.
- Extend the coverage of ECBC to the residential sector as well, with amendments to the EC Act.
- Declare certain categories of energy intensive buildings as Designated Consumers, with requirement for mandatory reporting of energy-use data and periodic energy audits.
- Mandatory energy efficiency upgrades through retrofits in existing public buildings.

2.4 The key interventions to achieve goals as furnished by the Ministry:

- Amendment of EC Act to extend the coverage of ECBC to the residential sector.
- Mandate States to adopt ECBC in their building bye-laws to avail benefits under Government National Missions such as Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart Cities Mission, etc.
- Constitute High Powered Committee under the Chairmanship of Chief Secretary of the State to provide oversight to implementation mechanism.
- Notification of energy intensive buildings as Designated Consumers.
- Mandate green building practices in all upcoming government construction.
- Notification by the State authorities for mandatory audits and implementation of energy efficiency upgrades in existing buildings.
- Widen scope of Star Labeling program for commercial buildings to cover multi-storey residential buildings as well.
- Prepare guidelines for PWD and other owners of public buildings to implement energy- efficiency upgrades.
- Prepare guidelines for design of low-income housing so as to optimize thermal comfort.
- Outreach programme for building owners and tenants about energy-saving opportunities.

2.5 Energy Conservation Building Code being a new concept in India, the Committee were desirous to know about the action being taken by the Ministry to make it mandatory for all realty units to comply with minimum standards of energy conservation.

When asked, the Ministry stated:

- *Two-thirds of the commercial and high-rise buildings that will exist by 2030 are yet to be built. Such rapid expansion presents an opportunity to make a significant contribution to both energy savings and tackling climate change,*
- *Energy Conservation Building Code (ECBC) was developed and introduced in the 11th Plan .In keeping this code sets minimum energy performance standards for commercial buildingskW or above or contract 100having a connected load of .kVA or above120demand of The main emphasis during the 11th Plan was concentrated on developing capacities and putting enabling measures in place to support large scale implementation of ECBC scheme. These included (1) empanelment of ECBC expert architects, (2) development of technical reference material such as ECBC User Guide (3) development of conformance/compliance check tool (ECONirman) to help architects/ design professionals and code compliance officials to assess conformance with code requirements, (4) Standard ECBC Training Modules covering various aspects of the code (5) harmonization of ECBC with National Building Code and (6) Guidelines for integration of ECBC within building bye-laws (7) amendments in Schedule of Rates / Plinth Area Rates of CPWD.*

2.6 (ECBC)Regarding the enforcement of the Energy Conservation Building Code : the Ministry stated

The enforcement of ECBC lies with the State Governments as per section" .of the Energy Conservation Act (a)15*Many States have gone ahead with ECBC amendment and adoption for their States, the status of which is given below:*

S.No.	Update Status	Name of States/UTs
1	States where ECBC has been notified	Rajasthan, Odisha, Uttarakhand, Punjab, Andhra Pradesh, Telangana, Karnataka, UT of Puducherry
2	States which are in the process of notification	Uttar Pradesh, Kerala, Chhattisgarh, Gujarat, Tamil Nadu, Haryana, Maharashtra, West Bengal, Himachal Pradesh, Bihar, Assam, Tripura, Jharkhand, Goa and Madhya Pradesh

BEE is providing support to States for training and capacity building of State Departments for adoption and enforcement of the code.

2.7 When asked about the mandate of the code for residential sector, the Ministry, in a note stated:

"The Energy Conservation Act does not provide a mandate for a code. The energy saving potential in homes is largely tapped through the use of BEE Star labeled appliances, However, Design Guidelines for 'Energy-Efficient Multi-Storey Residential Buildings' have also been developed with the objective to provide a comprehensive information on how to design energy-efficient multi-storey residential buildings. The Guidelines take into account different climatic conditions prevailing in the country. Current Guidelines are applicable to Composite and Hot-Dry Climates of India. These Guidelines have been circulated to States for adoption".

2.8 When the Committee desired to know to what extent the ECBC would be effective for energy saving and efficiency, the Ministry stated:

"The purpose of Energy Conservation Building Code (ECBC) is to provide minimum requirements for energy-efficient design and construction of buildings and their systems. For developing the Code, building construction methods across the country were reviewed and various energy-efficient designs and construction practices were evaluated that could reduce energy consumption in building. In addition, the detailed life-cycle cost analyses were conducted to ensure that the Code requirements reflect cost-effectiveness and practical efficiency measures across the five climatic zones in India. While taking into account the five climatic zones, the Code also addresses site orientation and specifies design practices and technologies that can reduce energy consumption without sacrificing comfort and productivity of the occupants.

The provisions of the Code apply to:

- *Building envelopes, except for unconditioned storage spaces or warehouses*
- *Mechanical systems and equipment, including heating, ventilation and air conditioning (HVAC)*
- *Service hot water heating*
- *Interior and exterior lighting*
- *Electrical power and motors*

2.9 On being queried about the energy conservation building code prescribed for commercial buildings, the Ministry, in a note, stated:

"The Energy Conservation Building Code has been formulated for new commercial buildings having a connected load of 100kW or contract load of 120KVA. BEE has developed a voluntary Star Rating Programme for existing buildings which is based on the actual performance of a building, in terms of

energy usage in the building over its area expressed in kWh/sq. m/year. In addition, the Star rating for existing buildings based on actual energy performance, Manual for Energy Efficiency up-grades in existing buildings and Design guidelines for Energy Efficient Multi-storey residential buildings has also been developed with an objective to widen the scope of energy efficiency under building sector.

2.10 The Smart City Project was launched on 25th June, 2015 by Hon'ble Prime Minister containing a wish list of infrastructure and services to be contained therein. These cities to be developed under the project shall invariably have the 4 pillars of comprehensive development – institutional, physical, social and economic infrastructure on energy efficiency. These Smart Cities will include electricity supply under the Smart Solutions Energy Management (SSEM). Under this, provisions for smart meters, managing renewable sources of energy and energy efficient green buildings have been proposed.

2.11 When the Committee desired to know as to whether it would be possible to make the existing realty units conservation friendly, the Ministry replied:

"Energy Audit Studies have revealed a savings potential to the extent of 40% in end use such as lighting, cooling, ventilation, refrigeration, etc. Energy cost savings resulting from energy efficiency retrofits directly benefit building owners and occupants over the life cycle of the building. The retrofits, if carried out by Energy Service Companies (ESCOs) on a Performance Contracting model, ensure that there are no capital investments by the building owner.

It is observed that since most buildings have nearly the same type of electrical stock, the energy efficiency retrofits for the standard equipment inventory can be institutionalized. These standard inventory items, be it lighting, fans, air-conditioners, pumps, etc., can be suitably retrofitted with energy efficient options using finances arranged by the ESCO on a deemed savings model with annuity repayment to ESCO. This model circumvents the need for initial capital investments as finance is arranged by the ESCO which is repaid to ESCO over an agreed period of time (contract period) in monthly or annuity repayments. The annuity payment modalities are frozen at the start of the project based on the project financials worked out on the stock installed".

2.12 On being asked about the implementation of the energy conservation measures on the existing units, the Ministry stated:

"The Bureau of Energy Efficiency in technical collaboration with Energy Efficiency Services Ltd. (EESL), has recently concluded implementation of energy conservation measures in two prominent Ministry buildings – NITI Aayog Bhawan (erstwhile Yojana Bhawan building of the Planning Commission of India)

and Shram Shakti Bhawan (housing the Ministries of Power; Labour & Employment; and Water Resources, River Development & Ganga Rejuvenation). These projects have demonstrated energy savings in the range of 20 to 25% with additional cost savings towards equipment maintenance and proven techno-commercial viability of undertaking such energy conservation measures. Based on the experience of these implementations, guidelines for carrying out energy efficiency up-grades in existing buildings have been developed for their large scale adoption and replication.

2.13 On a query regarding building rating systems, the Ministry stated:

" Building rating systems are a popular tool to add momentum in achieving energy efficiency in buildings. These help in assessing the level of performance of the building and provide opportunities in reducing the O&M costs of the building besides creating a market pull towards environmentally sustainable buildings. In order to enable rapid transformation towards energy efficiency in buildings, policies and measures that create a "supply push" (such as codes and standards) need to be supplemented by policies and measures that simultaneously create a "demand pull" as well. This "demand pull" attracts building users towards energy efficient buildings, and thus create a preferential market demand.

Therefore in order to promote a market pull for energy efficient buildings, a voluntary Star Rating Programme for buildings based on its actual performance, in terms of energy usage over its area expressed in kWh/sqm/year has also been developed. Currently, four categories of commercial buildings namely, Day Use Office buildings, BPO, Shopping Mall and Hospital buildings have been covered under the BEE's star rating of commercial buildings.

2.14 When the Committee asked the Ministry about the consultation process with the States regarding the corresponding rules prepared for energy conservation building codes, the Ministry, in a note, furnished as under:

"The draft Rules for ECBC were prepared by BEE in consultation with various stakeholders, including the States and discussed with the States in National Workshops for SDAs where all SDAs participated. The para wise provisions of these rules were discussed in these Workshops and its softcopies shared".

2.15 On Urban Development and Planning Issues, the Ministry furnished:

"A vast amount of building infrastructure in the country is yet to be built; it is estimated that two-thirds of the buildings that will exist in 2030 have not yet been built. This provides opportunity to ensure that every new building that is built is energy efficient. The Energy Conservation Building Code (ECBC), prepared by the Bureau of Energy Efficiency under the provisions of the Energy Conservation Act 2001 provides the norms and designs for building construction so as to ensure low energy consumption during the operation of the building. This ECBC

has been circulated, through the Ministry of Urban Development, to all the States along with model byelaws which can be incorporated into the existing State and municipal byelaws. Till date, 8 States have adopted the Code. The Code adoption is limited because States and municipalities do not have any direct benefits (or dis-benefits) related to the adoption of the ECBC since energy savings accrue to the building owners and the energy supply benefits accrue to the electricity distribution companies.

Therefore the notification of the ECBC in a State should be mandatory pre-condition to the provision of benefits under Central Government Urban Development programmes, including new proposed programmes in this area".

2.16 On being further queried about the general perception and response of the States on the rules, the Ministry stated:

"In the 12th Plan, all the States should notify the ECBC by the end of the Plan period and 75% of all new starts of commercial buildings should be ECBC compliant. Once the notification is issued in the States, ECBC Cells will be created in the States. The primary objective of the cell is to build the capacities of the PWD for considering ECBC compliant construction and its inspections both during construction and on compliance. Most of the States are in agreement with the provisions mentioned in the rules".

2.17 During the evidence, when the Committee asked about the energy efficiency particularly about the energy efficient building, the representative of the Ministry deposed before the Committee:

The need for energy efficiency assumes all the importance for the construction of new building, specifically commercial buildings because the use of air-conditions has become more frequent in the buildings now. we can minimise the need of air-condition by making the efficient buildings. Today we have members from Rama, Alama and credai who can share that what all they have done in this regards but we are more interested to know from you on the problems being faced on this front and what all can be done to enhance energy efficiency. Electricity and air-conditions are used in the buildings which consume energy. If we construct the building in such a way that the heat from outside is restrained to the minimum level viz apply insulation in the valve and the windows should also be made in such a way that it allows light but deters the heat. As a result of this it would lead to less requirement of air-conditions in the building and the air-conditioner of smaller size would also serve the purpose. The consumption of electricity can further be reduced by using the efficient air-conditioner. For this purpose it was stated in the Energy conservation Act that Energy Conservation Building code should be made. The buildings being constructed under this code have been found to be consuming almost half electricity from the conventional building. It was stated in the Act that this code should be adopted by all the States on by one. The builder falls under either the State subject or under the municipality subject. By new eight States have notified it. Hopefully, it would be

adopted by all the States. Developers have a major role to play in the construction of new building. It has been notified in eight states and the work is in progress in the 16 other states towards its notification".

CHAPTER III

Energy Intensive Industries

3.1 There are 478 units in the country categorized as Energy Intensive Industries. These are called designated consumers from the following sectors, i.e., Aluminium, Chlor Alkali, Pulp & Paper, Iron & Steel, Cement, Fertilizer, Thermal Power Plants and Textiles. They consume about 35% of the energy of the country. Perform, Achieve and Trade (PAT) is a regulatory program to reduce the specific energy consumption in energy intensive industries with the use of tradable energy conservation certificates. PAT is one of the flagship schemes under the National Mission on Enhanced Energy Efficiency and India is the first emerging economy to adopt an energy efficiency trading scheme that uses a market based mechanism. When compared to the baseline energy consumption at the beginning of the PAT scheme, the energy efficiency measures have resulted in a savings of around 6% till 2010.

2.

Sector	Specific Energy Consumption (ToE/MT)		
	2005	2010 (% saving over 2005)	2017 (projected % saving over 2005)
Cement	0.08	0.075 (6%)	0.07 (9.63%)
Pulp and Paper	0.78	0.72 (7%)	0.67 (29.49%)
Iron and Steel	0.70	0.66 (6%)	0.63 (10.29%)
Fertilizers	0.63	0.59 (6%)	0.57 (11.11%)

3.2 Guidelines to Companies on Energy Consumption and Conservation as furnished by the Ministry:

- All firms, registered under the Companies Act, are mandated to disclose their annual energy and energy conservation initiatives through the company's annual report. Ministry of Corporate Affairs through the companies (Disclosure of Particulars in the Report of Board of Directors) Rules in 1988, applicable from 1989, mandated each company to include an annexure after the Board of Directors Report on annual basis information on energy consumption and conservation of energy. The same provision was also included in Section 134(3) (m) of the Companies Act, 2013. The format as prescribed in the Rules is quite comprehensive and specific in the kind of information that has to be declared. There is no

exception given to any company registered under the Companies Act and therefore it would be correct to say that this has already created a data base for India Inc.

- Unfortunately, ever since the format has been prescribed, there does not seem to be any effort at either collating and analyzing this data. Nor has there been any effort at fine tuning or making it more focused, as no governmental agency or department goes through this return except in a cursory manner to see that the annexure is included. This fact has led to the reports in the annexures getting perfunctory and more semantic than hard data based.
- With the appropriate guidelines in place, the scope and nature of data provided, including energy and energy conservation data, will be more streamlined and robust. This will also encourage companies to undertake energy audits, identify energy intensive areas within the firm as well as formulate energy efficiency measures to improve energy savings.
- Outreach activities to consult with designated consumers and technology providers including knowledge exchange platform to share experiences within and between sectors.

3.3 When asked about the issues related to energy consumption by the Energy Intensive Sector, the Ministry stated:

"Under the Energy Conservation Act 2001, 15 energy intensive sectors have been identified for which energy consumption standards can be notified. At present, under the PAT programme, the BEE has notified energy consumption norms for 8 sectors. These 8 sectors together accounted for about 35% of the total energy consumption in the country in 2010.

Energy consumption norms should be notified for other energy intensive sectors listed in the EC Act. The coverage could increase to more than 50% of the energy consumption in the country through the addition of large energy consuming sectors".

3.4 Regarding the actions to accelerate industrial energy saving potential, the Ministry stated:

"In next three years, the industrial energy savings are targeted to reach 10% through widening the scope of PAT scheme to new sectors as well as increasing the penetration within the current sectors. In addition, guidelines for mandatory

disclosures on energy consumption by companies, under the Companies Act, will help in achieving the 10% targets."

3.5 Regarding the key interventions in order to achieve the goals under the PAT Scheme, the Ministry stated :

- *"Three new sectors shall be included starting from current financial year, namely, Railways, Distribution Companies and Refineries.*
- *All firms, registered under the Companies Act, are mandated to disclose their annual energy and energy conservation initiatives through the company's annual report. With the appropriate guidelines in place, the scope and nature of data provided, including energy and energy conservation data, will be more streamlined and robust. This will also encourage companies to undertake energy audits, identify energy intensive areas within the firm as well as formulate energy efficiency measures to improve energy savings.*
- *Outreach activities to consult with designated consumers and technology providers, including knowledge exchange platform to share experiences within and between sectors".*

3.6 When the Committee asked the Ministry about the energy consumption norms prescribed for energy intensive industries, viz. instruments/mechanism in place to ensure its compliance and provision for any penal action for its non-compliance, the Ministry, in a note, furnished:

"Under PAT scheme, compliance to the SEC target of DCs rests with States. The State Designated Agencies (SDAs) initiates adjudication process through SERCs. The penal provision under Section 26(1A) of EC Act says: "If any person fails to comply with the provisions of clause (n) of section 14, he shall be liable to a penalty which shall not exceed ten lakh rupees and, in the case of continuing failure, with an additional penalty which shall not be less than the price of every metric ton of oil equivalent of energy, prescribed under this Act, that is in excess of the prescribed norms".

3.7 On being asked about the comprehensiveness of the legal framework of energy conservation in the areas of energy intensive industries, appliances and commercial buildings in terms of electricity consumption, the Ministry stated:

"The broad areas covered under the legal framework of Energy Conservation Act, i.e. energy intensive industries, appliances, and commercial building are comprehensive in nature as far as electricity consumption is concerned. This is evident from the fact that the 35.3% of electricity was consumed by Industries, 10.3% by commercial buildings, 25.9% by domestic sector, 20.8 % by Agriculture and 2.0 % by Railways in 2012-13".

3.8 Detailing the initiatives taken for energy efficiency improvement in the areas of industrial sector, the Ministry furnished:

Energy efficiency improvement initiatives in energy intensive industries are being undertaken through capacity building of energy professionals (energy managers and energy auditors), undertaking of energy audits, establishment of specific energy consumption norms and standards. Among 15 Energy Intensive Industries as specified in the Schedule to EC Act 2001, 9 industries & establishments (Railways), have been notified as Designated consumers under Section 14 (e) of the EC Act, and selection of sectors was based on the ranking prepared based on the energy consumed.

Industrial plants from the 8 sectors (aluminium, cement, chlor alkali, fertilizer, iron and steel, pulp & paper, textile and thermal power sector) were selected based on the energy consumption cut of limit criteria (30,000 annual tonne of oil energy consumption (toe) for cement, iron & steel, fertilizer, pulp & paper and thermal power sector, 12,000 toe for Chlor alkali, 7500 toe for aluminium and 3,000 for textile), in order to include major energy consuming plants from these sectors to meet mandatory provisions under the Act. 478 plants were identified using this criteria and were notified as designated consumer. These DCs were covered under Perform Achieve and Trade (PAT) scheme, for which energy consumption norms and standards were fixed and mandated to undertake mandatory energy audits. These designated consumers had 165 million tonne of oil equivalent annual energy consumption in 2009-10, which was 43% of total energy (including electricity) used in Indian industry.

Overall, the SEC reduction targets aim to secure 4.05% reduction in energy consumption in these industries totaling an energy saving of 6.686 million tonne of oil equivalent. BEE has already initiated PAT deepening process to include more DCs both keeping the threshold same and in some sectors such as Iron & Steel and Pulp & Paper by reducing the threshold so that more and more industrial units participate in scheme. Similarly, widening of PAT for inclusion of 3 more sectors (Refinery, Railways and Electricity DISCOMs) for including in PAT cycle –II (2016-17 to 2018-19) has also been initiated.

3.9 When queried about the achievement made with regard to energy conservation by the energy audit from energy intensive industries, the Ministry stated that the result of mandatory energy audit of Energy Intensive Industries will be available after 27th November, 2015, since the industries will be submitting their energy audit reports up to 27th November, 2015.

3.10 On being enquired as to whether any study has been done with regard to performance of similar set of energy intensive industries abroad to assess the conservation efficiency, the Ministry stated that the International Energy Agency (IEA) has published a few reports in the past related to energy conservation potential like the Energy Efficiency Indicators (2014) and the Energy Efficiency Market Report (2013). Japan has carried out extensive work in the Iron and Steel Industry. However, there is no comparable mechanism like PAT Scheme, developed by India.

CHAPTER IV

Light Emitting Diode (LED), Domestic & Street Lighting

4.1 The Ministry stated that with the Government initiatives to promote LED lighting as well as changing consumer preferences, the LED market is likely to grow to Rs 21.6k Cr. by 2020. There will be an exponential growth from Rs.1,925 Cr. in 2013 to Rs.37.6k Cr. in 2020 due to the fact that the government has decided to change all street lights and lights in public spaces to LED lights, and initiated making all LED specifications mandatory. Further, notifications to commercial buildings to change existing lights exclusively to LED are in progress. All existing government schemes to distribute CFL are being modified with LED lamp distribution.

4.2 The Ministry has also stated that while the Government and industry are already taking steps to raise demand for energy efficient lighting, there exist supply side weaknesses in LED lighting products and LED Luminaries. This is because of limited testing capacity for LED lighting and heavy dependence on imports for electronic components and LED chips, as well as end product. Currently, their strength lies in conventional Luminaries and complete range of lamp manufacture, as well as availability of a strong labour force for assembling LED products. However, the Ministry's involvement in Luminaries design and research needs strengthening and support.

4.3 According to the Ministry's report, India has been very successful in manufacturing CFL and this can be replicated in LED as well by ensuring additional help in matching the incentives (e.g. cheap land, lower interest rates) offered by some of our neighbouring countries (like China, Sri Lanka) for manufacture of LEDs. Further, Indian manufacturing has potential to become more cost competitive vis a vis China with increasing labour costs in China compared to India. Large volumes of low quality imports in recent years have affected consumer confidence in new technologies, thus increasing the need for quality-control on supply in the market.

4.4 Regarding vision for the sector, the Ministry stated that the Indian lighting industry should focus on the following areas:

- Create demand for energy efficient lighting products to reduce India's lighting power consumption.
- Expand domestic capacity for LED testing, to support this increasing demand.
- Set Indian standards for all products and applications and make these standards mandatory.
- Enhance manufacturing capabilities in LED Luminaries, electronic components and LEDs and design capabilities for Luminaries, control gear and systems.
- Support skill development across all disciplines required by the lighting industry through R&D centres, educational institutions, and training centres.
- Evaluate opportunities to optimize manufacturing and disposal processes to reduce the environmental impact.
- Create demand for energy efficient products like LEDs by using in all public spaces, promoting use of energy efficient lighting through awareness programs and financial incentives, signing MOUs to export lighting products to neighbouring countries, reviewing product-wise taxation (to make LEDs/ CFLs relatively lower price).
- Support local manufacturing over imports through subsidies and incentives (manufacturing clusters with strong infrastructure, tax-breaks, low interest capital availability, anti-dumping duty, limited FDI restrictions, etc.)

4.5 The Ministry further stated that Regulators should create green and IEC compliant standards for products and applications and ensure implementation by making standards mandatory; pass regulation to phase out inefficient lighting sources like GLS lamps and magnetic ballast; and make a strict energy conservation building code (ECBC) mandatory for large lighting users.

4.6 The Ministry has furnished details of similar initiatives taken up to promote LEDs (even more energy efficient) as under:

- The Government plans to change all street lighting to LEDs (potential of Rs.12,000 Cr. of LEDs over the next 3 yrs and another Rs 39500 Cr. of LED lights from 2017 to 2020).
- The Government has initiated sending notifications to commercial buildings to change existing lights exclusively to LED.

- Under RGGVY scheme, the government plans to provide LED Lamps to BPL houses.
- Existing DSM schemes by State Governments for distribution of CFL are now being replaced with LED lamps.

4.7 Regarding initiatives taken for environmentally safer products, the Ministry stated:

- Regulations have been introduced to make mercury containing lamps by reducing their mercury content
- CFL: Mercury content reduced from 15-20mg of liquid mercury/ lamp, to <5mg of amalgamated mercury (by end of 2014). Further plans to reduce to <3.5mg/lamp by 2015 and <2mg/lamp by 2020.
- Fluorescent lamps: Initiated steps to reduce mercury content with amalgam pellets to <5mg/lamp by 2015 (from the current 15-16mg/lamp).

4.8 According to the Ministry, the sector will get an impetus from the huge demand forecasted for all types of lighting products, specially LED and CFLs, driven by increasing awareness and rural electrification, large distribution network with a huge number of retail outlets, availability of huge manpower (skilled/unskilled), strong manufacturing, capability and capacity for luminaries and light sources (GLS, CFL, FTL) which are ready for conversion to LED manufacturing plants.

4.9 Regarding the challenges in the sector, the Ministry stated:

"The challenges which will be there are the Indian lighting industry is less energy efficient compared to other countries; significant scope for improvement, lack of exact data-base, low capability for domestic production of electronics; majority of value-add for Indian LED market is done outside India; and less Govt. support compared to global competitors like China, which has become a global manufacturing hub for LED/ Electrical components through a lot of government support".

4.10 The bottlenecks as identified by the Ministry are:

- Low R&D and Testing lab capability.
- Lack of skill development programs and institutions.
- No availability of rare earth materials.
- High cost of capital due to high interest rates.

- Low consumer confidence, due to poor quality products in the market.
- Low awareness among consumers about benefits of LEDs/ CFLs, consumers scared by the cost without understanding the benefits.
- Poor power quality condition, requiring products to have very strong specification.
- Weak logistics infrastructure.
- Inefficient & high transportation cost.
- Potential to move to greater automation in lighting (including dimmability option) via a strict and mandatory Energy Conservation Building Code (ECBC). This would also leverage India's software skills for automation.
- Low quality, cheap imports (e.g. from China) flooding the market and competing with locally manufactured product.
- Disruptive technological changes which could take time and money for adoption by local manufacturing plants.
- Adoption of Global Protectionist Policy by many countries, closing out the option of exporting locally manufactured products.

4.11 Regarding initiatives taken on consumer demand for energy efficient lighting products, the Ministry stated:

- Conduct consumer awareness/ education programs to educate about lifetime value of energy efficient lighting products and not just upfront value.
- Launch innovative financing schemes to make energy saving LEDs affordable and attractive to all strata of consumers, even in rural areas.
- Develop affordable LED solutions suited to the lower income strata in India.
- Promote and subsidize use of solar powered LEDs in remote locations with no access to power.
- Design and make mandatory strict product specification standards, compliant with IEC (covering Safety, Performance and Reliability) for all products (LEDs/ CFLs) to boost consumer confidence.
- Make energy conservation building code (ECBC) mandatory for large lighting users to promote use of LEDs.
- Create standardized labeling for lighting products to provide consumers the right information for making decisions - lumen output, lumen/ watt, life (in hrs), wattage, light appearance.
- Demand generation by government (urban development, NHAI, Municipal Corporations).
- Create differential taxation/ VAT for lighting products based on energy efficiency to promote green technology and reduce power consumption (ELCOMA to propose, govt. to implement) - Reduce VAT to <5% for LED lighting product (energy efficient product).

4.12 On LED testing facilities, the Ministry stated:

- Add NABL approved LED testing facilities to support growth of LEDs established through funding support - Labs managed by ELCOMA (in association with and funded by research/ educational institutes) - Labs funded by industry, government (MoP, DietY, etc.).
- Define lifetime testing specifications for all critical components used in Lighting Fixtures (LED, ELCO, passive components, MOFSET reflectivity, etc.) - e.g. test for driver, aging test, Voltage, Surge, Switching Testing Criteria, etc.
- Abolish import duty on testing equipment.
- Ensure faster processing for NABL accreditation for testing labs.

4.13 LED and LED Luminaries manufacturing capability as stated by the Ministry:

- Promote local manufacturing by creating a manufacturing cluster via SEZ for all LED lighting related products (Luminaries and assembling, LED encapsulation, electronic components), with tax incentives and other benefits like - cheap land, good infrastructure in the form of testing lab, warehousing, uninterrupted cheap power, water, and smooth logistics connectivity to ports and NHs (enabling reduction in logistic cost).
- Provide fiscal incentives to increase capital inflow in manufacturing set-ups through removing FDI restrictions and providing low interest capital.

4.14 Regarding design hub for LED Luminaries, control gears and systems, the Ministry stated:

- Set-up research and design facilities for LED Luminaries, control gears and systems.
- Sign MOUs with strategic partners on technology sharing with India.
- Generate demand for improved designing and software systems through awareness and stricter standards for lighting in public areas, commercial complexes and industrial areas, designed to save power (e.g. via ECBC).

4.15 Research, education and training initiatives of the Ministry for improvement of LED:

- Set-up training centres for luminaries design and manufacturing.

- Set-up educational centres promoting study of lighting technology and application.
- Set-up R&D centres (in collaboration with premier educational institutes) focused on new and efficient lighting technologies, with funding from industry participants and premier institutes.

4.16 Hon'ble Prime Minister launched the 100 cities National Programme on 5th January, 2015 to convert all the conventional street lights with smart and energy efficient LED street lights and the Domestic Efficient Lighting Programme (DELP) to provide LED lights to domestic households. DELP has been implemented in 4 districts of Andhra Pradesh and in UT of Puducherry and has already replaced 62 lakh incandescent lamps used by domestic households with LEDs. Around 92,000 conventional street lights has been replaced with LED street lights in Vizag.

4.17 Goals of the Ministry to accelerate saving potential in 3 years include:

Household Lighting: About 77 crore incandescent bulbs are targeted to be replaced with LED bulbs. This is likely to result in a total reduction in connected load of 20 GW and energy savings of 100 BU annually. The total annual savings in electricity bills will be around Rs. 40,000 crore.

Street Lighting: The total connected load of the 3.5 crore street lights across the country is around 3400 MW, which can be reduced to 1400 MW by replacing them with LED based street lights. These can lead to annual savings of around 9 BU and annual cost saving of Rs. 5,500 crore to municipalities.

4.18 The key interventions of the Ministry to achieve the goals are:

- Department of Revenue, *M/o* Finance and CBDT may consider reduction in excise duty for LED lamps to lower their prices and increase market penetration. Also, clarify service tax application so as to avoid double taxation.
- Department of Revenue, *M/o* Finance may consider providing LED based energy efficiency projects infrastructure status and priority sector lending.
- *M/o* Urban Development may consider linking support under Central Urban development programs to include changeover to LED streetlights by municipalities.
- Department of Industrial Policy & Promotion may facilitate and support the setting up of LED chip and driver-on-board chip manufacturing facilities in India,

within the context of the National Campaign of "Make in India".

- M/o Consumer Affairs and BEE may facilitate setting up of testing infrastructure for LED bulbs and street lights across the country to ensure quality and credibility.
- State Governments may formulate action plans to promote the use of LED bulbs in households and streetlights in municipalities in consultation with all stakeholders.
- Department of Expenditure may consider allocating funds for LED based energy efficiency projects from the National Clean Energy Fund, especially those installed in heritage sites.
- State Electricity Regulatory Commissions may consider issuing regulations to require DISCOMs to invest in LED based energy efficiency DSM projects.
- For LED based street lighting in municipalities, the cost recovery model is such that the pay outs are within the present level of expenditure that the municipality incurs on energy bill and maintenance cost. Parliament may consider amendment of EC Act to include ULBs in the schedule as an energy intensive sector to facilitate the switch over to LED streetlights.
- EESL to develop contents with distribution companies and municipalities for LED programmes; also to support development of other Energy Service Companies (ESCOs).
- Provision of higher-wattage LEOs in the market.
- Research & Development of innovative advanced lighting technologies.
- Outreach programme about LED lighting projects.

4.19 Regarding disposal of LED bulbs, when queried by the Committee during the evidence, the representative of the Ministry replied:

"As regards disposal of LED bulbs, we have worked with the Ministry of Environment and Forests so that LED bulbs come under e-waste disposal rules where it is the responsibility of the manufacturer. He has to recover and ensure its disposal. So we are putting it there right in the beginning. It is under e-waste disposal rules of the Ministry of Environment and Forest. The draft rules are already out".

4.20 The barriers in the sector as stated by the Ministry :

- Limited availability of LED technology in India
- High initial cost of LEDs that makes the pay-back period very long

- Absence of national standards for LEDs - as a result, industry is prone to import sub-standard products
- Consumer awareness very low
- Lack of testing protocols, facilities and accredited laboratories at the national level; no incentive either to set up manufacturing facilities in India as is the case with China.

CHAPTER V

Energy Conservation in Agriculture Sector

5.1 As reported by the Ministry of Power, India's agriculture sector consumes 19% of total national electricity consumption in the country which has about 20 million pump sets. Most of the pump sets installed are inefficient having 20-25% efficiency level, which in turn results in wastage of electricity and higher agriculture electricity subsidy burden on States. Significant energy saving (20-25%) potential exists in the agriculture pumping sector which can be tapped easily through policy instruments and rollout of business models for large-scale changeover. In order to accelerate the adoption of energy-efficient irrigation pump-sets, an agricultural Demand Side Management (DSM) programme has been launched through which farmers get more efficient energy. The energy efficiency programme aims to help farmers to get more energy efficient pumps with the help of utilities and Energy Service Companies (ESCOs) without capital investment. The upfront capital investment is recovered from the energy and cost savings for repayment to the ESCO.

5.2 The Ministry has stated that in order to tap the energy saving potential, an Agriculture Demand Side Management (AgDSM) program was initiated in the XIth Plan by the Bureau of Energy Efficiency with an objective to induce energy efficiency in agriculture sector by creating market based framework for implementation of a few pilot projects and create awareness among end users and other stakeholders for adoption of energy efficient irrigation pump sets (EEPS). Five pilot AgDSM projects are being implemented through PPP mode in three States, namely, Maharashtra, Karnataka and Andhra Pradesh.

5.3 To accelerate the saving potential in the agricultural sector, the Ministry has initiated actions as follows:

- Establishment of a robust enforcement mechanism at the State level to ensure use of Star Rated pumps sets for every agricultural connection. In order to encourage farmers to install energy efficient irrigation pump-sets reduction in energy use in existing agricultural pump-sets by upgrades through Public Private Partnerships.
- Initiation of pump-set replacements programmes in locations where feeder segregation has occurred.

5.4. The key interventions to achieve the goals under the agricultural sector as furnished by the Ministry include:

- State government to play a key role in implementation and enforcement of Ag-DSM programmes. This includes establishment of specific cells within the SDAs for ensuring enforcement of various DSM activities under agriculture sector.
- Differential taxation structure for energy efficient pump-sets in order to encourage farmers for adopting them.
- Link Ag-DSM programme to Deen Dayal Upadhyaya Gram Jyoti Yojana.
- Provision of resources for incentives for manufacturing of energy efficient pump-sets through National Clean Energy Fund.
- Infrastructure status and priority sector lending for Ag-DSM projects.
- EESL to enter into contracts with State electricity distribution companies for changeover to energy-efficient pump-sets on a performance-contract model; also to encourage other ESCOs to enter the market.
- Regulations to enable and require electricity distribution companies to implement pump-sets demand-side management programmes.
- Outreach campaign to sensitize consumers about opportunities for energy savings.

5.5 On a query regarding the achievement of goals under the agricultural sector in terms of energy saving, the Ministry stated:

"BEE will pursue with State Governments for issuing notifications for mandatory use of star label EE pumpsets in new agriculture connections and setting up of a robust enforcement mechanism be put into place so that the use of minimum 4 star rated pump sets for every new agricultural connection is ensured. BEE and EESL are in the process of carrying out projects in 5 States for large scale replacement of inefficient pump-sets with energy efficient pump-sets".

CHAPTER VI

State Designated Agencies (SDAs)

6.1 According to the Ministry, the implementation and enforcement of the provisions of the Energy Conservation Act in the States is to be carried out by SDAs. The SDAs have been set up in 34 States/UTs by designating one of the existing organizations as required under section 15 (d) of the Energy Conservation Act, 2001. These agencies differ from State to State with the Renewable Energy Development Agency (44%), Electrical Inspectorate (25%), Distribution Companies (12%), Power Departments (16%) and others (3%). In order to kick-start the energy conservation activities at the State level with an emphasis on building institutional capacities of the SDAs, the Ministry of Power had approved the scheme of providing financial assistance to the State Designated Agencies for strengthening their institutional capacities and capabilities during the XIth Plan.

6.2 The Ministry has also stated that SDAs have been formed in the States to give thrust to the conservation of energy. Currently, only two SDAs are standalone energy efficiency organisations. In other States, the SDAs are housed in the renewable energy development agency, the electricity distribution companies or the electrical inspectorate. The Ministry stated that based on current experience, the effectiveness of the SDAs requires that States should consider establishing the SDAs for energy efficiency as independent Directorates, overseen by a Committee of Secretaries, headed by the Chief Secretary, which would ensure both access of the SDA to policy makers in the State administration, as well as inform policy makers about energy efficiency opportunities in their respective Departments. Further, it would enable the development of a work programme that is based on regulations and the facilitation of commercial transactions for energy efficiency, rather than on subsidy-driven programmes or as an energy sales-driven organisation.

6.3 Regarding the SDAs, the Ministry further stated:

"The Energy Conservation Act, 2001 mandated the creation of a two-tier organization structure to promote the efficient use of energy and its conservation in the country with BEE as the nodal agency at the central

level and State Designated Agencies (SDAs) as the nodal agencies at State/ UT level. Since energy efficiency was new for these organizations notified as SDAs at the State level, initially, during the XI Plan, to kick-start the energy efficiency movement, BEE / MoP disbursed financial assistance in a view to strengthen their capacity. The various energy conservation and energy efficiency activities undertaken by SDAs have reported an avoided capacity addition of 1065 MW during the XI Plan".

6.4 List of the State Designated Agencies (SDAs) is given at **Annexure -I**.

6.5 When the Committee queried about the effectiveness of the SDAs during the evidence, the representative of the Ministry deposed before the Committee:

"As far as SDAs are concerned, they are there in all States. The problems is that they are not very effective. Sitting in Delhi, we cannot do it. It has to be on the ground. Unless State Designated Agencies are effective this programme will not go anywhere".

6.6 Insofar as, the major achievements in the implementation and enforcement of the provisions of the Energy Conservation Act in the States are concerned, the Ministry stated :

- Internet platform was developed by 26 SDAs.
- 47 demonstration projects implemented in street lighting and water pumping stations.
- LED Village Campaign implemented by 28 States.
- Investment grade energy audit completed in 491 Govt. buildings.
- During the XII Plan, thrust will be on establishment of the enforcement machinery at the State level.

6.7 Regarding institutional issues including Demand Side Management (DSM) programme, the Ministry submitted:

"Under the Energy Conservation Act, 2001, each State is to notify an agency that would be responsible for the implementation of the Act in the State. Most States have either notified the renewable energy development agency, or the electricity distribution company, or the electrical inspectorate for this purpose. Only 2 States have notified standalone agencies for this purpose whose sole responsibility is the promotion of the energy efficiency in the State. The success and longer term continuity of energy efficiency programmes is better in States where standalone agencies are in place because of the exclusive institutional thrust for this matter.

Further, some States are implementing focused DSM programmes to reduce the electricity demand. These include programmes to promote LED lighting, and energy efficient agricultural pumpsets. However, large scale replications of these programmes across all States is required. States also need to build these DSM programmes into their electricity planning, including in the preparation of the 24 x 7 electricity supply action plans. All States should adopt the model of standalone SDAs, and prepare and implement energy efficiency action plans in their States.

CHAPTER VII

Promotion of the Concept of Energy Conservation

7.1 The Ministry, in a note, stated that considering the need to make the next generation more aware regarding efficient use of energy resources, it is necessary to introduce the subject to children during their school education. In this regard, promotion of energy efficiency in schools is being promoted through the establishment of Energy Clubs. The Bureau of Energy Efficiency is implementing the Students Capacity Building Programme under the Energy Conservation Awareness Scheme for the XIIth Five Year Plan and intends to prepare the text/material on Energy Efficiency and Conservation for its proposed incorporation in the existing science syllabi and science text books of NCERT for classes 6th to 10th.

7.2 In an effort to spread the message of energy efficiency in the country, the Government of India is promoting the adoption and use of energy efficient LED bulbs. LED bulbs have a very long life, almost 50 times more than ordinary bulbs, and 8-10 times that of CFLs, and therefore provide both energy and cost savings in the medium term.

7.3 Hon'ble PM launched a web-based system to enable consumers in Delhi to register requests for procuring LED bulbs under the Domestic Efficient Lighting Programme (DELP). Hon'ble PM also announced that such programme will be replicated in cities across the country.

7.4 About 77 crore incandescent bulbs are sold in India for domestic (household) lighting and if all of them are converted to LEDs, 25 billion KWh (20,000 MW) of energy can be saved every year. Through bulk procurement, the Government of India has been successful in bringing down the cost of a 7W LED bulb from about Rs.400 per piece in 2013 to about Rs.90 per piece as on date. While 3 crore LED bulbs are expected to be installed in the domestic sector by the end of 2015, the number will increase to about 15 crore by the end of 2016 and then to about 50 crore by 2020.

7.5 In the 12th Plan, the Ministry proposed to take forward all of the schemes so as to continue to achieve the energy savings due to the regulatory, financial and facilitative activities under these schemes. New schemes are also being proposed to fast-forward the introduction of "super-efficient equipment" through the provision of incentives for every super-efficient equipment that is sold during a specified time period and accelerate the deployment of energy efficient appliances through electricity distribution company-led DSM programmes.

7.6 As far as energy efficient products and equipment (such as refrigerators and air conditioners) are concerned, they cost more than less-energy efficient products, and consequently buyers are reluctant to purchase them because of the higher first-cost, even though the additional cost is recovered over a short period of time due to the lower energy consumption. Consequently, a strong financial signalling mechanism is required in addition to the Star Label which provides information to the consumers about the energy efficiency of the products. Hence, the taxes and duties on energy efficient products could be differentially lower than those of less efficient products. For example, 5-star products could enjoy a lower rate of taxation than 1-star or 2-star products.

7.7 The Ministry has also proposed to promote the research, development, and deployment of identified energy-efficient products (which have potential to have large-scale impact on energy use) by public and private sector enterprises. It is also proposed to enhance the quantity and capacity of trained manpower for implementation of energy efficiency projects in industry, buildings, and power stations.

7.8 Through these proposed activities, it is anticipated that an avoided peak capacity of 4861 MW would be achieved in the 12th Five Year Plan.

Scheme	Sub-Head	Outlay XIIth Plan	Revised Estimates XIIth Plan	Budget 2015-16	Avoided Capacity Savings (MW)
BEE Scheme					
Standards, Codes & Labelling for	Standard & Labelling Scheme (S&L)	133.00	0.00*	0.00	2308

Appliances, Buildings & Energy Efficiency Research Centre	Energy Conservation Building Code (ECBC)	35.00		35.00		12.30		2422
			289.50		35.00		12.30	
	Energy Efficiency Research Centre for Energy consuming sectors	121.50		0.00**		0.00		
Strengthening of SDAs for Energy Efficiency	SDAs Strengthening Scheme (SDA)	140.00		135.31		18.69		
			255.00		205.31		32.69	
	Contribution to SECF	50.00		50.00		10.00		
	HRD Scheme	65.00		20.00		4.00		
Demand Side Management (Agriculture, Municipal & SME)	Designated Consumers & SMEs	55.00		40.00		9.00		131
	Agriculture DSM	80.00		71.00		16.76		
			235.00		184.80		45.23	
	Municipal DSM	25.00		25.00		6.00		
	Capacity Building of DISCOMS	75.00		48.80		13.47		
Total of "BEE Schemes"		779.50	779.50	425.11	425.11	90.22	90.22	
Ongoing EAP Scheme								
BEE-GEF-WB MSME Project		7.91	7.91	7.91	7.91	0.71	0.71	
Total (B)		787.41	787.41	433.02	433.02	90.93	90.93	4861 MW (tentative)

Note :- * The funds (Rs.120.20 crore) for this Scheme will be met from Standard & Labeling Fee which is part of the Energy Conservation Fund.

** EFC Committee advised to take support through the National Clean Energy Fund (NCEF) instead of budgetary resources of MoP. Accordingly, the same has been removed from GBS.

(Rs. in Crore)

Scheme	Sub-Head	Budget 12 th Plan	Revised Budget 12 th Plan	Avoided Capacity Savings (MW) 12 th Plan	Budget 2015-16
Energy Conservation & Award/ Painting Competition Scheme	National Energy Conservation Day/ Awards, Painting Competition, Awareness & Publicity (NECA)	100.00	119.95	710	28.20
National Mission on Enhanced Energy Efficiency (NMEEE)	Perform Achieve and Trade (PAT) and Partial Risk Guarantee Fund (PRGF), Venture Capital Fund (VCFEE) Energy Efficiency Financing Platform (EEFP)	690.00	652.50	1350	258.30
	Bahat Lamp Yojna (BLY)	22.50	22.50	3781 (Estimates under revision, as scheme future depends on the	10.25

				continuation of CDM)	
	Super Energy Efficient Equipment Programme (SEEP)	900.00	100.00	1648	27.40
	Total	1,712.50	894.95	7489 MW (Tentative)	324.15

Physical Target & Achievement:

Sl. No.	Scheme	Sub-Head	Targeted savings during XII Plan (BU)	Achievement (BU)		Target for 2014- 15 (BU)
				2012- 13	2013-14	
BEE Schemes						
1	Standards, Codes & Labelling for Appliances, Buildings & Energy Efficiency Research Centre	Standards & Labelling	13.95	2.41	2.86	3.15
		Energy Conservation, Building Codes & Existing Buildings	6.81	0	0	0
		Energy Efficiency Research Centre for Energy Consuming Sectors				
2	Strengthening of SDA for Energy Efficiency	SDA Strengthening Prog.				
		Contribution to SECF				
		HRD Programme				
3	Demand Side Management (Agriculture, Municipal & SME)	Designated Consumers & SMEs	2.46	0	0	0
		Agriculture DSM	0.97	0	0	0
		Municipal DSM	0.63	0	0	0

		Capacity building of DISCOMS				
		Total of (A)	24.82	2.41	2.86	3.15
Ongoing EAP Scheme under "BEE" head						
1	BEE-GEF-WB MSME project (External Aided Project) from 2010-11 onwards for 5 years	BEE-GEF-WB MSME project (External Aided Project) from 2010-11 onwards for 5 years	0	0	0	0
		Total (B)	0	0	0	0
	Total of "BEE Schemes"	Total of (A+B)	24.82	2.41	2.86	3.15

Energy Conservation Schemes

1	Energy Conservation Awareness, Awards & Painting Competition Scheme	Energy Conservation Awareness, Awards & Painting Competition Scheme	4.58	4.64	4.84	5
2	NMEEE	NMEEE	16.06	0	0	0
		Bachat Lamp Yojana	5.9	0.63	0.03	0
		Super Efficient Equipment Programme	8.8	0	0	0
	TOTAL of "Energy Conservation"		35.34	5.27	4.87	5
	Grand Total (BEE & EC)	Grand Total (A+B+C)	60.16	7.68	7.73	8.15

*T&D considered as 10% for EC Award and 23.97%

Financial Estimates & Achievement:

Sl. No.	Activity/ Organisation		GBS (2012-13)	GBS (2013-14)	GBS (Total)
1	BEE Schemes	Estimates	52.80	77.60	130.40
		Achievement	44.10	66.72	110.82
2	EC Schemes	Estimates	61.00	16.00	77.00
		Achievement	37.00	16.00	53.00
	Total	Estimates	113.80	93.60	207.40
		Achievement	81.10	82.72	163.82

7.9 According to the Ministry, the following main activities are under progress:

- Review the existing science syllabi and science text books of NCERT for classes 6th to 10th and assess the need of level of information on energy efficiency and conservation proposed to be included.
- Develop separate and exclusive draft text module (English and Hindi version) for energy efficiency and conservation to be included in science syllabi and science text books of NCERT for classes 6th to 10th.
- Development of training module (English and Hindi version) and conducting training of teaching staff.

7.10 The Ministry has further stated that through their project, recommendations will also be made to the National Council of Education, Research and Training (NCERT) to update the science text books of classes VII to IX to include relevant chapters on Energy Efficiency in the school syllabus.

7.11 When asked about the initiatives taken for promotion of the concept of energy conservation, the Ministry stated:

BEE has proposed executing a nationwide 2-year long consumer-focused campaign on energy efficiency in India to promote efficient utilization of energy among different categories of electricity consumers, including households, institutions and industries. The campaign will emphasize on generating interest, driving initiative and conversation on a mass movement towards energy efficiency in India, and thus facilitate the behavioral change among the public via a mass movement. Through large scale awareness campaign for energy consuming equipment and appliances, BEE is superimposing the benefits of using good practices and energy efficient technologies. These methods are expected to assist citizens of the country to adopt energy efficiency as a way of life".

7.12 Regarding the promotional activities on energy conservation, the Ministry further stated:

"BEE annually organizes National Energy Conservation Award recognize innovation and achievements in energy conservation by the industries, buildings, zonal railways, state designated agencies; manufacturers of BEE star labeled appliances, electricity distribution companies, municipalities and raise awareness that energy conservation plays a big part in India's response to reducing global warming through energy savings. The awards are also recognition of their demonstrated commitment to energy conservation and efficiency. The scheme

has motivated industry and other establishments to adopt energy efficiency measures. 39 sub-sectors of Industry, thermal power stations, office buildings, BPO buildings, hotels, hospitals, shopping malls, zonal railways, railway workshops, railway stations, municipalities, State Designated Agencies and manufacturers of BEE Star labeled appliances/equipment and electricity distribution companies are included in the Awards. In total there are 56 Sub-sectors from the above main sectors. The responses among the industrial and commercial units have become very encouraging as is evident from the increasing participation level (from 123 in 1999 to 1010 in 2014).

7.13. The Ministry has further stated that keeping in view the fact that children are the best agents of change we need to equip them with the information and knowledge on energy conservation and create interest among them on this important subject. In this regard, the Ministry of Power has taken an initiative and has been organizing Painting Competition on Energy Conservation for students since the year 2005. The competition is held in three stages, namely, School, State and National Level since 2005. The paintings drawn by children reflected their interest in the energy conservation activities and their concern about energy crises and climate change, and have effectively conveyed inspiring ideas in their impressive paintings. The vibrant designs, the confident depiction of the topic and remarkable composition seen in these paintings reflect clear understanding of the subject themes in the minds of these young children.

7.14 On the issue of promotion/publicity, the Secretary, Ministry of Power, informed the Committee, during the course of evidence, as under:

:We accept that we have to go in for a high intensity publicity campaign. So, we will chalk out the programme and do it.

Sir, there is also a need for incentive and disincentive to be built into the systems. That is an area which we will look at but, Sir, what you have pointed out is that for specific programmes like LED bulb, we need to work out a detailed roadmap and an Action Plan with financials. Since it is a massive programme, all the loose ends should be tightened so that we know precisely how we are going to finance it, how we move on that path and reach the target.

7.15 On being enquired about the coordination of the Ministry with State Designated Agencies in spreading awareness on energy conservation in the States, the Ministry stated:

"BEE is working closely with SDAs in spreading awareness on energy efficiency and energy conservation in the States involving school children, consumers, dealer networks, industry associations, etc. through organizing exhibitions /

workshops / conferences. Brochures and leaflets on the information are normally printed both in English as well as vernacular languages. In this regard, BEE has dedicated financial allocation to specifically carry out awareness campaigns. During the XII plan, SDAs have been allocated financial assistance of Rs 13 crore to carry out publicity and awareness campaign".

7.16 During the evidence, when the Committee desired to know about the provision to promote LED in the budget, the representatives of the Ministry of Finance stated:

“ We had 10% customers duty earlier. In certain items CBD was 12% which was excise and 4% was SAD. Government has given lot of concession. In certain items it was 26 which is reduced to 16., thus, we are looser by 10 percent. The special addition duty has been reduced by 4 per cent. It has been made zero from 4 per cent. The countervailing duty in the LED driver has been made 6 percent from 12 percent. The special addition duty has been made zero from 4 percent. The excise duty or CBD has been made MRP bases instead of actual cost, reduction cost. This is the only difference.

7.17 Regarding technology upgradation in the sector for better performance of electrical appliances and activities relating to Research and Development, it was informed that there is need for creating a strong information base and a technology platform. A lot of technologies are coming up all over the world. We will be creating a technology platform by which India can access these technologies and appropriately fine-tune them and use them in the country.

7.18 The Committee desired to know the view of the Government on the creation of separate time zones with a view to conserve the energy. In response, the Government replied:

"The Ministry of Power had received a request and the Bureau of Energy Efficiency commissioned the Study which was carried by the National Institute of Advanced Studies, Bangalore. They looked at three alternatives. One was having two time zones. The second was that for six months of the year, the clock goes ahead, daylight savings time. The third was that the clock can be moved ahead – the Indian Standard Time itself can be moved by about half-an-hour or one hour. Sir, they looked at three options. The largest energy savings were when we moved the clock ahead. The second largest was that when the clock can be moved ahead for half-an-hour or one hour ahead for six months of the year. There will be the least energy savings but there will be still energy savings when we moved to two time zones. On the basis of this, they came to a conclusion that a half-hour advancement of Indian Standard Time would probably be the best both for the reasons of providing more light-working hours in the North East as well as for energy savings. This Report was circulated to

various Ministries. Right now, we have been asked to have a consultation with the States and also with the Ministries to get a view on what should be the next step. Sir, we are in the process of doing so".

7.19 When the Committee enquired about the ban on manufacturing of high end power consuming electronic goods, the representative deposed before the Committee:

"In many things like refrigerator, air conditioners, tube lights, transformers, etc. anything which is less than one star cannot be manufactured. The second thing we do is that, we periodically tighten the stars so that what was two stars yesterday becomes one star today and old one star is out of the market. That is how, the consumer keeps on getting the best products. We are bringing colour televisions and geysers also in the mandatory list. We will slowly keep on increasing the number of products that are part of the mandatory labelling programme".

CHAPTER VIII

Investment in Energy Conservation

8.1 According to the Ministry, estimation has been done about the requirement of funds for achieving the targets under the National Mission for Enhanced Energy Efficiency (NMEEE). The Mission, prepared after extensive stakeholder consultations, seeks to create conducive regulatory and policy regime to foster innovative and sustainable business models to unlock this market. About 23 million tons oil equivalent of fuel savings in coal, gas and petroleum products is likely to be achieved along with an expected avoided capacity addition of over 19,000 MW and as a consequence carbon dioxide emission reduction is estimated to be 98.55 million tons annually.

8.2 When the Committee asked about the Government's proposal to attract investment in this sector, the Ministry stated:

"The Cabinet on June, 2010 approved the National Mission for Enhanced Energy Efficiency (NMEEE) which focuses on enhancing energy efficiency in all sectors – industry, commercial, buildings, agriculture, etc. It seeks to unlock the immense market potential for energy efficiency by a set of measures to enable vibrant markets in these sectors. The implementation framework is comprehensive, and addresses most of the critical issues relating to methodology, delivery mechanisms, and monitoring and verification, while also delineating clear deliverables in a time bound manner at the same time attracting private investment. The Mission goals are market-based approaches to unlock energy efficiency opportunities, estimated to unlock energy efficiency opportunities to be about Rs.74,000 crore".

8.3 On being asked the manner in which the Government will realize its Mission, the Ministry, in a note, replied:

"BEE being the nodal agency for implementation of the Mission. A company [Energy Efficiency Services Ltd. (EESL) as a Joint Venture of 4 CPSUs, viz. NTPC, PGCIL, REC and PFC] is created to provide implementation leadership in the market to unlock the energy efficiency potential of Rs.74,000 crore to flow in".

8.4 When asked about the Fiscal and Financing issues, the Ministry stated:

"Energy efficiency projects typically pay for themselves in as much as that the savings in energy costs payback for the investments over a short time period. However, it is difficult to find investments for energy efficiency projects because banks and financial institutions tend to look at these projects as less tangible since they result in cost savings rather than additional revenue generation which can be sequestered for loan repayment. Further, because of interest rates in the 10 to 14% range, these projects tend to have very long payback periods (7 to 9 years). Financial institutions are uncomfortable as to whether borrowers would continue to repay from savings over such a long period of time. In view of these constraints, it is important that a financing regime is created in which these risk perceptions can be minimized. Consequently, it would be better if the energy efficiency projects can be considered as infrastructure project to avail of the benefits under Section 80 C similar to benefits provided to energy generation projects".

8.5 With a view to obtaining the views of the stakeholders, on arranging the finances to give the desired thrust to the sector, the Committee held discussion with representatives of FICCI, CII, TATA Power, BSES and Indian Captive Power Producers Association. One of the stakeholders deposed before the Committee as under:

"Financing and fiscal instruments of energy efficiency is another one. Money is one thing which can make things happen. We would strongly propose some sort of concessional finance for energy conservation in the country. India is a country which is developing and industries have got competing opportunities for increasing their overall productivity and turnover. So, there is always a competition for an industry in terms of investment between increasing production and energy efficiency. So, there is an opportunity to create a concessional finance for energy efficiency. We feel energy efficiency can further accelerate and become a movement. There could be opportunities like higher floor-air ratio for green buildings. This has been implemented in some of the local bodies. This has created lot of increase in green buildings. These are a few examples. We can share with you some more suggestions on fiscal incentives which can make energy efficiency go up further and accelerate".

8.6 On being asked about the tax concession to the sector, a representative of the Ministry of Finance informed the Committee as under:

"We are giving tax concessions to LED lights. For wind power, both for parts and entire equipment, we have given concessional rates of duty. We have also given concessional rates of duty for biogas plants. For energy efficient vehicles we have given concessional duty like for electric and hybrid vehicles. A range of concessions have been given for energy conservation in both renewable energy and for solar and wind and also for biogas or for energy efficient vehicles. Whether it is compact Florescent Lamp or LED light, we have given lots of concession in the central excise and custom duty for energy conservation and

device equipment. As far as Income Tax issue is concerned, we have given a lot of concessions in this 80% depreciation is available on the energy savings device. 80% accelerated depreciation is available on the energy savings non conventional energy saving devices, solar energy, wind energy and profit link deduction would be available for power sector for 10 years which includes non conventional energy. Besides this, five years tax benefit is available for conversion of bio-degradable waste into bio-gas, bio-fertilizers and bio-energy, 100% deduction is available for five years".

8.7 In this regard, the Committee was further informed by the representative of Ministry of Finance that additional duty exemption has been given for the imports and for parts and internal components has also been given. If any specific request is received from the Ministry, we shall look with that. There is no comprehensive study which has been done at present. But we have given exemptions for the whole range of LED manufacture. We have a large number of items for which we have given accelerated depreciation. We can take the list from them and examine. The basis of giving depreciation on accelerated basis is the life as well as the obsolescence which it reaches over a period of time. We can examine the list of components. Some of the items which are there now, they might be already eligible for this 80 per cent depreciation. We can take all the components from them and examine.

8.8 On the issue of availability of National Clean Energy Fund to Energy Conservation drive, the representative of the Ministry of Finance replied as under

"On behalf of the Department of Expenditure, we are very concerned about disbursement and performance of NCEF. We have taken many steps over the last one year or so to improve disbursement from this Fund. Just to give you an update, the projects are sponsored by the implementing Ministries and then they come to the Finance Ministry where an Inter-Ministerial Group is set up for appraisal and approval of such projects. Up to March, 2015, about Rs. 16,000 crore has been accumulated in the NCEF and 56 big projects from various Ministries have been approved by the Government amounting to a total expenditure of about Rs. 35,000 crore. So far, about Rs. 10,000 crore has been disbursed. In the present Budget we have simplified the disbursement mechanism because the Ministries were finding it difficult to access and route it to the implementing agencies. From this year onwards, we are routing this fund directly into the budget of the respective Ministries so that for disbursement and release, they do not have to come back to us. The Department of Expenditure has an Integrated Finance Division in every Ministry".

8.9 The Ministry furnished the four initiatives which they have spelt out in National Mission for Enhanced Energy Efficiency (NMEEE) as follows:

- **Perform, Achieve and Trade (PAT):** On 30th March, 2012 energy saving targets for 478 designated consumers belonging to 8 sectors were notified. Consultations are conducted regularly post notification at state and sector level to communicate and inform designated consumers about the PAT implementation process, and to seek their views and experiences. In the first cycle of PAT (ending in year 2014-15), 478 industrial units in 8 sectors (Aluminum, Cement, Chlor- Alkali, Fertilizer, Iron & Steel, Paper & Pulp, Thermal Power, Textile) have been mandated to reduce their specific energy consumption (SEC) i.e. energy used per unit of production. Overall, the SEC reduction targets aim to secure 4.05% reduction in energy consumption in these industries totaling an energy saving of 6.686 million tonne of oil equivalent. Units which are able to achieve SEC level that are lower than their targets can receive energy savings certificates (ESCerts) for their excess savings. The ESCerts could be traded on the Power Exchanges and bought by other units under PAT who can use them to meet their compliance requirements. Units that are unable to meet the targets either through their own actions or through purchase of ESCerts are liable to financial penalty under the Energy Conservation Act. This will be followed by 2nd and subsequent cycles with more number of industrial sectors and units participating with more stringent energy conservation norms and standards. Bureau of Energy Efficiency (BEE) has prepared Sector Specific Form-1 (annual energy return form) along with Sector specific Normalization Factors to streamline the monitoring and verification (M&V) process. The sector/ sub-sector specific Normalization Factors were developed to neutralize the effects on specific energy consumption (SEC) in the assessment year as well as baseline year so that undue advantages or disadvantages could not be imposed on any DCs while assessing the target. BEE has put in place a process of accreditation of Energy Auditors who will be engaged to execute the M&V process of DCs to assess their performances. PAT deepening process to include more DCs both keeping the threshold same and in some sectors such as Iron & Steel and Pulp & Paper by reducing the threshold so that more and more industrial units participate in scheme. Similarly, widening of PAT for inclusion of 3 more sectors (Refinery, Railways and Electricity DISCOMs) for including in PAT cycle –II (2016-17 to 2018-19) has been initiated.
- **Market Transformation for Energy Efficiency (MTEE):** Under MTEE, two programmes have been developed i.e. Bachat Lamp Yojana (BLY) and Super Efficient Equipment Programme (SEEP).

Bachat Lamp Yojana (BLY): It is a public-private partnership program comprising of BEE, Distribution Companies (DISCOMs) and private investors to accelerate market transformation in energy efficient lighting. Under this program, over 29 million incandescent bulbs have been replaced by CFLs under this programme. In the next phase of BLY, BEE will promote use of LED lights using the institutional structure of BLY Programme. BEE provides support to Rural Electrification Corporation (REC) for framing technical specification and monitoring and verification of the energy savings from the LED bulbs distributed under RGVVY scheme to BPL households. BEE will also undertake outreach activities to promote large scale adoption of LEDs.

Super-Efficient Equipment Programme (SEEP): The other component under MTEE is a new programme called Super-Efficient Equipment Programme (SEEP). SEEP is a program designed to bring accelerated market transformation for super-efficient appliances by providing financial stimulus innovatively at critical point/s of intervention. Under this program, ceiling fan has been identified as the first appliance to be adopted. SEEP for ceiling fans aims to leapfrog to an efficiency level which will be about 50% more efficient than market average by providing a time bound incentive to fan manufacturers to manufacture super-efficient (SE) fans and sell the same at a discounted price. The goal is to support the introduction and deployment of super-efficient 35W ceiling fans, as against the current average ceiling fan sold in Indian market with about 70W rating. To avoid inefficiency getting locked in economy for its life, this program aims to stimulate technological upgradation and their accelerated introduction by manufacturers through an incentive mechanism which would motivate manufacturers to manufacture such super-efficient fans and sell at competitive price in a highly price sensitive fans market.

- **Energy Efficiency Financing Platform (EEFP):** Under this programme, MoUs have been signed with financial institutions to work together for the development of energy efficiency market and for the identification of issues related to this market development. MoUs with M/s, PTC India Ltd., M/s. SIDBI, HSBC Bank, Tata Capital and IFCI Ltd. have been signed by BEE to promote financing for energy efficiency projects. BEE has developed training modules in collaboration with HSBC and also conducted few training programs for financial institutions on energy efficiency project financing.

- Framework for Energy Efficient Economic Development (FEEED):**
 Under this initiative two funds have been created viz. Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and Venture Capital Fund for Energy Efficiency (VCFEE). Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) is risk sharing mechanism to provide commercial banks with a partial coverage of risk involved in extending loans for energy efficiency projects. The amount paid out will be equal to the agreed-upon percentage of the outstanding principal and will not cover the interest or other fees owed to the bank. The Guarantee will not exceed Rs 3 crore per project or 50% of loan amount, whichever is less. Initially the support was provided to only government buildings and municipalities; however, in the Twelfth Plan it has been extended to cover SMEs and industries too. Rules for operationalization of Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) were approved in April 2012, subsequent to which Supervisory Committee for PRGFEE has been constituted. Recently, the consortium of RECPDCL-REC-EESL has been selected as the Implementing Agency for operationalization of PRGFEE and revised rules of PRGFEE have been sent to Ministry of Law for vetting of the notification.
- The Venture Capital Fund for Energy Efficiency (VCFEE) is a fund to provide equity capital for energy efficiency projects. A single investment by the fund shall not exceed INR 2 crore. The Fund shall provide last mile equity support to specific energy efficiency projects, limited to a maximum of 15% of total equity required, through Special Purpose Vehicle (SPV) or INR 2 Crores, whichever is less. The support under VCFEE is limited to Government buildings and municipalities. Rules for operationalization of Venture Capital Fund for Energy Efficiency (VCFEE) were approved in April 2012, subsequent to which Board of Trustees has been constituted for VCFEE Trust. Through the tendering process Fund Manager has been identified for operationalization of VCFEE and revised rules of VCFEE have been sent to Ministry of Law for vetting of the notification.

8.10 When the Committee asked about the State Energy Conservation Fund during the evidence, the representative responded:

"On the State Energy Conservation Funds, 26 States have established the Fund. The Government of India has given Rs.2 crore to each State for starting the Fund. Another 17 States have provided Rs.2 crore or more into the Fund and to these 17 States, we have given Rs.2 crore more also. But nine States and Union Territories are yet to create the State Energy Conservation Fund. On the issue of idea given by you regarding removing 100 watts bulb, we shall work in tender with you that how it can be done

CHAPTER IX

Other Important Aspects of Energy Conservation

A. Energy Audit

9.1 Energy audit is a technique used to establish pattern of energy use; identify how and where losses are occurring; and suggest appropriate economically viable engineering solutions to enhance energy efficiency in the system studied. Instrumented and diagnostic energy audits (with aims ranging from identifying ways of conserving energy to evolution of a new blue print for the energy system) provide insight into the modes of better utilization of fossil resources and high-grade energy and exploration of renewable energy options.

9.2 As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption".

9.3 The general methodology of instrumented & diagnostic energy audit consists of the following:

- Preliminary data analysis
- Measurement at site
- Data analysis
- Recommendations based on economic viability-short term, medium term & long-term measures.
- Report submission, discussion of recommendation with the client & finalizing the report with the client.

9.4 The need for Energy Audit as stated by the Ministry:

"In any industry, the three top operating expenses are often found to be energy (both electrical and thermal), labour and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about the ways energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists".

9.5 The Ministry also stated that the Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes

which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment, etc.

9.6 The Ministry further stated that in general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame. The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a "bench-mark" (Reference point) for managing energy in the organization and also provides the basis for planning a more effective use of energy throughout the organization.

9.7 Consequent to the Honorable Prime Minister's announcement that all Govt. Organisations should bring down their energy consumption by 30% and private 62 organizations by 20%, over a period of next 5 years, by conducting comprehensive energy audit studies, the Bureau of Energy Efficiency (BEE), has identified about 10 Govt. buildings. In this connection, CPRI Engineers have conducted energy efficiencies studies along with other Energy Auditors & ESCOs in major buildings like Rail Bhavan, Sanchar Bhavan, IGI Airport and AIIMS. The studies have identified major energy saving potentials in Lighting system, HVAC system, Water pumping system, etc.

B. AT&C Losses

9.8 Energy losses occur in the process of supplying electricity to consumers on account of technical and commercial reasons. AT&C losses are Aggregate Technical and Commercial losses. The technical losses are due to energy dissipated in the conductors and equipment used for transmission, transformation and distribution of power while commercial losses are due to pilferage of energy by hooking of lines and bypassing the meters, defective meters, errors in meter reading, etc. These technical losses are inherent in a system and cannot be eliminated entirely but can be reduced to a certain level. These losses depend on the pattern of energy use, load density and configuration of the transmission and distribution system.

Main Reasons for high technical Losses

- (a)Overloading of existing lines and substation equipment
- (b)Absence of up-gradation of old lines and equipment
- (c)Low HT: LT lines ratio
- (d)Poor repair and maintenance of equipment
- (e)Non-installation of sufficient capacitors/reactive power equipment

Reasons for Commercial Losses

- (a)Low metering/billing/collection efficiency
- (b)Theft, pilferage of electricity and tampering of meters
- (c)Low accountability of employees
- (d)Absence of Energy Accounting and Auditing

Part –II

Observations/Recommendations of the Committee

The Energy Efficiency and Energy Conservation both goes together. The Conservation and efficiency efforts additional investment which can be used for furtherance of energy development or for the other developments.

- Cooperation of all the stakeholders must.
- Need to evolve target for major important sector.
- Efficiency in construction of residential buildings, commercial complexes, encouragement to green buildings.
- Special efforts to bring efficiency in use of energy instrument in agriculture.
- Better, renewal energy in the operation of agriculture pumps.

Energy Conservation Building Code (ECBC)

2. The Committee note that the norms for energy standards for commercial buildings having a connected load of 100 KW or contract demand of 120 KVA and above were developed in May 2007. These were known as Energy Conservation Building Code, giving flexibility to the State Governments to modify the Code, based on their local and regional needs. The Bureau of Energy Efficiency (BEE) has developed a Voluntary Star Rating Programme for buildings based on actual performance in terms of energy usages. The building sector presently utilizes about 34% of the overall electricity and it will increase as this sector is set to grow due to rapid urbanization. The current percentage of electricity utilization in the building sector can be streamlined through various methods of energy efficiency. These *inter-alia* include mandatory implementation of Building Codes, energy efficiency upgradation through retrofits, star labeling, appliance efficiencies and improved design features of the upcoming buildings. To achieve the objective, States should be taken on board to ensure that all buildings are ECBC compliant for which other essential logistical arrangements may be made. Buildings using electricity beyond the set parameters may be declared as designated consumers having the mandatory reporting of energy use data and periodic energy

audits. These measures will help in economizing energy use in the building sector.

The Committee, therefore, strongly recommend that:

- (i) Guidelines for implementation of energy efficiency measures in:**
 - All the residential complexes above – Sq. Meters.
 - All Malls, multiplexes should have energy efficiency plan/Programmed.
 - Local Bodies be asked to make cooperation and make it mandatory in the building plan guideline to implement energy efficiency guideline.
 - The Ministry with the help of Industry Ministry must prepare special energy efficiency guideline/code for all the major industries.
 - Energy efficiency code for small cities.
 - Special encouragement/incentive for green buildings.
- (ii) With the help of consumer efforts, Ministry of Power and the Ministry of Urban Development jointly evolve energy conservation guidelines i.e. Energy Conservation Building Code which should become part of National Building Code.**
- (iii) The building sector should be accorded the desired priority from the energy efficiency viewpoint and all concerned, particularly State Governments and its agencies, realtors, private developers, housing societies and individuals, should be suitably informed about the importance of the issue, with particular reference to building design, stringent energy codes, appliance standards, aggressive promotion of super-efficient building products and systems, management of energy and technologies and integration of renewable and storage solutions.**
- (iv) They should also be sensitized about their role and responsibilities in this regard, besides linking it with the recently launched Smart Cities Mission so that the objective of energy savings from the sector is effectively achieved.**

3. The Committee find that electricity use in the building sector is likely to touch 50% from the current level of 34% in the next decade. India is also likely to have an extremely high cooling load in excess of 100 GW owing to its tropical climate, large population and rising aspirations of the people. To tackle the problem, a sustainable cooling initiative will have to be taken to cool the demand by setting a target. For this, guidelines may be evolved for low income housing to optimize thermal comfort. For supporting the ECBC scheme, capacity should be developed and enabling measures be put in place. States should also be informed about the benefits under the Government National Missions, such as, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart Cities, etc. The Committee note that a large number of States are yet to notify the Conservation Codes. These States should be persuaded to notify them without further delay. Besides, policy measures should be put in place to have sustainable building designs, adaptive thermal comfort standards validated by proper research, stringent notification of air-conditioner efficiency standards, mainstreaming of non-vapour based HVAC technology and adoption of Automated Demand Response strategies to tide-over the peak demand. **The Committee, therefore, recommend that in view of the anticipated higher demand of electricity in future in the building sector, adequate policy measures having technical standards for upcoming buildings may be formulated and notified expeditiously.**

4. The Committee note that the Bureau of Energy Efficiency in technical cooperation with Energy Efficiency Services Ltd. has concluded implementation of energy conservation measures in two prominent Government buildings, i.e., NITI Aayog and Shram Shakti Bhawan in New Delhi housing various Government Departments. These projects have demonstrated energy savings in the range of 20% to 25% with additional cost savings towards equipment maintenance and proven techno-commercial viability of undertaking such energy conservation measures. Based on the experience of these implementations, guidelines for carrying out energy efficiency up-grades in existing buildings have been developed for their large scale adoption and replication. The Committee are appreciative of these efforts of the BEE in energy savings in the Government buildings. However, it is felt that more is required to be done in this regard. **The Committee, therefore, recommend that a time bound target should be set to bring all Government buildings, at least to begin with in Delhi, within the purview**

of energy efficiency norms as about 25% of saving electricity will help in substantial energy savings.

Energy Intensive Industries

5. The Committee note that there are 478 industrial units categorized as energy intensive industries called designated consumers from 8 sectors. They consume about 35% of the total energy of the country. They are: Aluminium, Chlor Alkali, Pulp & Paper, Iron & Steel, Cement, Fertilizer, Thermal Power Plants and Textiles. However, there is no clarity about the norms defining an industry as energy intensive industry; neither has there been any practice specifying the consumption percentage of energy as qualifying standards for energy intensive industry. The Committee are also unclear about the number of units in the country which have been described as designated consumers. In the absence of a proper definition of energy intensive industry, it will be appropriate to have some clear parameters to categorize an industry as being energy intensive. **The Committee, therefore, recommend that:**

- (i) A study may be undertaken to include few more industries in the compulsory energy efficiency list.**
- (ii) There may be major campaign by Ministry, Power PSUs, DISCOMs and also industries involvement in power sector be asked to draft and implement major awareness campaign on 'Energy Efficiency and Energy Conservation'.**

6. The Committee have taken note of the fact that there are a large number of industries which should be categorized as energy intensive industries based on their energy consumption. It has been proposed to bring in Railways, Distribution Companies and Refineries under the PAT scheme thereby implying their inclusion into the energy intensive industry sector. Although this is a welcome step, but it is limited in scope. A Survey should be conducted to identify more such industries so that they can be dealt with accordingly for the purpose of energy efficiency targets. Energy consumption norms should be notified for other energy intensive sectors listed in the Energy Conservation Act, 2001. This may increase the coverage to more than 50% of the energy consumption in the country through the addition of large energy consuming sectors. Besides, penetration should also be increased and intensified for identifying

the industries within the current sectors so that near accurate number of designated consumers in the country can be identified. For the purpose, a drive may be initiated to be completed in a time-bound manner. **The Committee, therefore, recommend that more number of industrial activities may be brought into the energy intensive industry sector based on the defined criteria.**

7. The Committee observe that under the Companies Act, all the registered firms are mandated to disclose their annual energy consumption and conservation through the company's annual report. The Ministry of Corporate Affairs, through the Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, mandated each company to include an annexure after the Board of Directors Report on annual basis information on energy consumption and conservation. The same provisions were also included in Section 134 (3)(m) of the Companies Act, 2013. There is no exemption given to any company. This has been done with a view to encouraging companies to have robust and streamlined conservation data. This will also encourage them to undertake energy audits, identify energy intensive areas within the firm and formulate energy efficiency measures. However, these measures have not yielded the desired results due to the lackadaisical approach of the Government to take necessary follow up action. There does not seem to be any serious effort at either collating or analyzing the relevant data. It is also observed that no effort has been made to fine tune them, leaving the Reports in the Annexures being perfunctory and semantic, than data based. The Committee feel that had proper action been taken on the data collected in the companies report, it would have led to creation of a clear database for energy efficiency purposes. **The Committee, therefore, recommend that:**

- (i) Since last 25 years, companies are publishing/releasing measures/data on energy efficiency measures taken by the company in the Annual Report. Need to analyse the data.**
- (ii) Henceforth data collected in the annual report of companies should be collated and analysed for the purpose of formulating appropriate policy regarding energy efficiency in the industries.**
- (iii) Designated consumers should also be mandated to provide report about the action taken by them on the observations made following**

analysis and collation of data supplied by them in their annual report.

- (iv) The Ministry should prepare guideline and fix responsibility on an agency to study/scrutinize the energy efficiency measures taken by the companies which are reported in their Annual Reports. Such data could be useful for planning and correcting the policies.**
- (v) The Committee has observed that a lot of scope to improve both the above concepts, the Ministry with the help of Corporate Ministry and CERC, CEA can refresh the guideline and also evolve system to scrutinize and use such data.**

8. The Committee note that during the next three years, the industrial energy savings are targeted to reach 10% through widening the scope of PAT schemes to new sectors as well as increasing vigil in the current sectors. In addition, guidelines for mandatory disclosures on energy consumption by companies under the Companies Act will help in achieving the 10% targets. The Committee understand that the Perform, Achieve and Trade (PAT) is a regulatory programme to reduce the specific energy consumption in energy intensive industries with the use of tradable energy consumption certificates. This is one of the flagship schemes under the National Mission on Enhanced Energy Efficiency using a market based mechanism. Under the scheme, which is the first cycle of PAT, the designated consumers have been mandated to reduce their Specific Energy Consumption (SEC) to 4.05%. Units which achieve SEC level that are lower than their targets can receive energy saving certificate for their excess savings. These certificates can be traded on power exchanges and bought by other units under PAT who can use them to meet their compliance requirements. Units that are unable to meet the target either through their own actions or through certificate purchases are liable for financial penalty under the Conservation Act. This will be followed by the second and subsequent cycles with more number of industrial sectors and units participating with more stringent energy conservation norms and standards. The Committee appreciate the steps taken for enforcing energy efficiency in the industrial sector, even though these steps were taken only in the year 2012. Still, a lot more can be done to make the energy intensive industries energy efficient. **The Committee, therefore, recommend that instead of waiting for the second cycle to**

identify the sectors and units for making them energy efficient compliant, it would be better if this process is continued uninterrupted till the prescribed standards for energy efficiency are observed by the all industries, irrespective of their energy intensity.

Light Emitting Diode (LED)

9. The Committee find that the Government has taken an initiative to promote LED lighting in the country in a big way, changing all street lights and lights in public spaces with LED lights. It is estimated that by the year 2020, the LED market will grow to about Rs.37,000 crore from Rs.1,925 crore in the year 2013. All existing Government schemes to distribute CFL are being modified with LED lamp distribution. Under the DDUGJ Scheme, the Government plans to provide LED lamps to BPL houses. Existing DSM schemes by State Governments for distribution of CFL are now being replaced with LED lamps. All LED specifications have been made mandatory and notifications are being issued to commercial buildings to change existing lights to LED. The Committee welcome the initiative of the Government for raising the demand of the energy efficient lighting. However, the Committee are apprehensive about the realization of the projections, in view of the prevailing ground realities. There exist huge supply weakness, limited testing capacity and heavy dependence on imports of electronic components and chips. Although these factors are dampening and discouraging, yet there is also a brighter side. India's strength lies in conventional luminaries and complete range of lamp manufacture as well as availability of strong labour force for assembling LED products. Our success in CFL manufacturing can be replicated in LED as well. This can be done by providing help in the form of cheap land, lower interest rates etc. Increasing labour cost in China can provide India an edge in becoming a competitive player. The Committee feel that the challenges of the sector can be transformed into opportunities by commitment and untiring efforts. **The Committee, therefore, recommend that:**

- (i) The Street Lights concept is 100 year old. The Technology used is also needs to modernize recent initiative of the Power Ministry to convert street lights into LED based Street Lights, needs in-depth study and action plan.**

- (ii) **Keeping in view the huge potential available for growth, all efforts should be made to turn this into a national opportunity so that energy efficiency in our household and street lightings becomes a reality, thereby resulting in substantial savings.**
- (iii) **The present initiative of the Ministry to encourage/motivate the LED technology is appreciable. The Government after in-depth study must plan an action plan to use the LED technology in different schemes including residential.**

10. The Committee observe that large volumes of low quality imports have affected consumer confidence in new technologies, thus increasing the need for quality control on the imports and supply. To enforce it, Indian standards for all products and applications will have to be set and made mandatory, besides creating demand for efficient lighting products. Also, manufacturing capabilities in LED luminaries will have to be enhanced ensuring high quality electronic components, control gear and design capabilities. Local manufacturing should be supported over imports through subsidies and incentives in the form of manufacturing clusters with strong infrastructure, tax breaks, low interest capital, anti-dumping duty and limited FDI restrictions. It will also have to be ensured that optimization of manufacturing and disposal processes do not have adverse environmental impact. Regulators should also create green and IEC compliant standards for products and applications, ensure implementation by making standards mandatory and pass regulation to phase out inefficient lighting. **The Committee, therefore, recommend that in order to promote and strengthen domestic LED manufacturing, a congenial environment with reasonable assurance of stable support base and encouraging regime should be made available to the entrepreneurs of the country.**

11. The Committee observe that there are identifiable challenges which are posing difficulties to the Indian Lighting Industry. These *inter-alia* include low capability of domestic production of electronics, less energy efficient products, lack of precise database, majority of value addition for Indian LED market being done outside India and less Government support to the sector. The most critical impediment facing the sector is the woefully inadequate testing lab facilities. Consumer confidence can be ensured only with quality products, duly tested in approved laboratories. The backdrop in which

LED market is burgeoning further emphasizes the need for adequate testing capabilities. Since this sector is set to grow exponentially, corresponding facilities ensuring quality products to instill confidence among the consumer have become all the more necessary. This can be done only by making available sufficient testing devices. The Committee have been informed that as of now there are very limited testing facilities for LED lights available with the BIS. The rates for such testings are also not uniform and unreasonably high which is creating serious hindrances in the development of the sector. **The Committee, therefore, strongly recommend that:**

- (i) Immediate steps should be taken to make available adequate and reliable testing facilities for LED lights in the country. To achieve the objective, NABL approved labs and other such apparatus may be considered for empanelment so that the growth of the sector is not impeded.**
- (ii) Also, rates may be prescribed for such testings to ensure that exploitation does not take place and the prices of the final product are reasonable and uniform all across the country.**
- (iii) Life time testing specifications for all critical components used in lighting fixtures, including LED, ELCO, MOFOST reflectivity, aging test, etc., may also be defined.**

12. The Committee observe that this is an upcoming market with huge potential, yet having an uncertain and unreliable logistical background. There is a conspicuous lack of educational training and research in the field. If not dealt with properly, this may end up in the weakening of the growth at the desired pace and also the erosion of the confidence of the consumers. **The Committee, therefore, recommend that:**

- (i) Training centres for luminaries, design and manufacturing, educational centres promoting study of lighting technology and application be set up immediately.**
- (ii) Research and development centres in collaboration with premier educational institutes should also be established, focusing on new and efficient lighting technologies.**
- (iii) Various suggestions/observations have been received from the Manufacturers, distributors, DISCOMs regarding implementation of**

LED technology in India must be considered by the Power Ministry and take necessary action.

Energy Conservation in Agriculture Sector

13. The Committee note that India's agriculture sector consumption accounts for 19% of the total electricity consumption of the country. There are about 20 million pump sets in the country and most of them have efficiency level as low as 20% - 25%. This is a major contributor of wastage of electricity and higher agriculture electricity subsidy burden on States. Since most of the States provide free or highly subsidized electricity to agriculture sector, irrespective of the size of the land holdings, the agriculturist hardly finds any incentive to use more energy efficient pump sets which are costlier. The Committee, therefore, believe that unless there is intervention of the State in this matter, not much is going to change. The Ministry has, however, reported that in order to accelerate the adoption of energy-efficient irrigation pump sets, an agricultural Demand Side Management (DSM) programme has been launched through which farmers get more energy efficient pumps with the help of utilities and Energy Service Companies (ESCOs) without capital investment. The upfront capital investment is recovered from the energy and cost savings for repayment to the ESCO. **The Committee while welcoming this step, feel that:**

- (i) State Governments have to play a key role in the implementation and enforcement of the Agriculture DSM programmes. Therefore, they should establish a specific cell within the State Designated Agencies for ensuring enforcement of various DSM activities in the agriculture sector.**
- (ii) The Committee believe that in tandem with the above mentioned pumps' replacement programme, the policy of incentivizing production and use of efficient pump sets and discouraging inefficient pumps set through differential taxation will also help in achieving energy efficiency in this sector.**
- (iii) The Committee further recommend that there should be outreach campaigns to sensitize consumers in this regard.**

- (iv) Action Plan for the improvement of millions of operating agriculture pump sets, road map to convert the agriculture pump sets into solar agriculture pump sets.**

State Designated Agencies (SDAs)

14. The Committee note that the Energy Conservation Act, 2001 mandated the creation of a two-tier organizational structure to promote the efficient use of energy and its conservation in the country with BEE as the nodal agency at the central level and State Designated Agencies (SDAs) as the nodal agencies at State/Union territory level. The Committee have been informed that so far 34 States/ UTs have set up SDAs as required under section 15(d) of the Energy Conservation Act, 2001 by designating one of the existing organizations, be it Renewable Energy Development Agency, Electricity Distribution Company or Electrical Inspectorate for this purpose. It was further informed that currently only two SDAs are standalone energy efficiency organizations. The Committee have also noted the fact that the success and longer term continuity of energy efficiency programmes is better in States where standalone agencies are in place because of the exclusive institutional thrust for this matter. The Committee are surprised to note that even after 14 years of the enactment of the Energy Conservation Act, 2001, except for two, the remaining SDAs are not specialized agencies with the sole responsibility of promotion of energy efficiency in their States. Further, most SDAs are located in organisations whose primary purpose are activities other than energy efficiency, and consequently, there is neither organisational priority for energy efficiency activities, nor any linkage to policy making at the level of the State administration. The Committee being well aware of the importance of these SDAs in the implementation of energy conservation programme, feel that it is the high time to reinvigorate them. **The Committee, therefore, recommend that:**

- (i) The Ministry should persuade all the States to establish SDAs for energy efficiency as an independent standalone agency, overseen by a Committee of Secretaries, headed by the Chief Secretary which would ensure both access of the SDA to policy makers in the State**

administration and inform policy makers about energy efficiency opportunity in their respective Departments.

- (ii) The Committee also desire that sufficient funds be allocated for the SDAs.**

Promotion of the Concept of Energy Conservation

15. The Committee observe that a two-year long nationwide campaign has been proposed on energy efficiency to promote efficient utilization of energy among different category of electricity consumers. It aims at behavioral change among the public by generating interest, driving initiative, etc. The BEE is organizing national energy conservation awards and recognizing innovation and achievements in energy conservation by industries, building, railways, State designated agencies, manufacturers of star-label appliances, electricity distribution companies, etc. The Government has also been organizing Painting Competitions for students since the year 2005. While these efforts are laudable, it appears that such campaigns are not getting the due attention in the rural areas where it is required the most. It is as though the rural areas do not figure anywhere in the promotional campaign. **The Committee, therefore, recommend that for the purpose of promotion campaigns, the BEE should closely work with SDAs in spreading awareness on energy efficiency and conservation in the rural areas in the States, among consumers, dealer networks, industry associations, etc.**

Investment in Energy Conservation

16. The Committee observe that an estimation has been done about the requirement of funds for achieving the targets under the National Mission for Enhanced Efficiency (NMEE). The Mission seeks to create a conducive, regulatory and policy regime to unlock the market by focusing on enhancing energy efficiency in all sectors, i.e., industry, buildings, commercials and agriculture. On fiscal issues, the Committee have been informed that energy efficiency projects pay for themselves through savings in the energy cost. However, it is difficult to find investments for energy efficiency projects as banks and financial institutions look at these projects as less tangible. Further, the interest rates are also a deterrent to investments as these projects have very long

payback period. Moreover, there is no comprehensive study which has been done at present to fulfill the financial requirements of the sector. The financial support from the Government is available to LED lights in the form of tax concessions. The Committee are of the view that the available financial support from the Government is not sufficient for the growth of the sector. **Therefore, it is recommended that:**

- (i) the Government may consider providing infrastructure status and priority sector lending to LED based energy efficiency projects, reduce excise duty on LED lamps to lower their prices and increase market penetration.**
- (ii) The Power Ministry may take up with the Finance Ministry to declare the conversion of Street Lights into LED based Street Lights Project into Infrastructure Project.**

Energy Audit

17. The Committee note that as per Planning Commission, India is the fourth largest consumer of energy in the world after USA, China and Russia but it is not endowed with abundant energy resources. Considering the acute shortages being faced by the country, the Committee believe that we should pay utmost attention towards efficient use of energy and its conservation. The Committee also believe that Energy Audit is the pre-requisite of energy saving. Energy Audit, as per the Energy Conservation Act, 2001, is the verification, monitoring and analysis of use of energy, including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption. The Committee also note that in any industry, the three top operating expenses are often found to be energy, labour and materials. Out of the three, the energy component has the highest potential for cost saving. The Committee was informed that in the Small and Medium Enterprises, wherever Energy Audit has been undertaken, it has resulted in reduction of at least 20% of energy consumption. They were further informed that Energy Audit Studies have revealed a savings potential to the extent of 40% in end use such as lighting, cooling, ventilation, refrigeration, etc. The Committee have been apprised that reduction of 3% of the total energy consumption of Delhi through use of efficient equipment would result in a huge saving of Rs. 21,000 crore. The Committee, considering the findings of these limited scale Energy Audit, believe that this is only the tip of the iceberg in terms of the

energy saving potential available in the country. The Committee are aware that consequent to the Honorable Prime Minister's announcement to bring energy consumption by the Government and Private Organizations by 30% and 20%, respectively, the Bureau of Energy Efficiency (BEE) has identified some buildings for Energy Audit. However, the Committee feel that there is an urgent need for increasing the scope of Energy Audit and the pace of its execution. **The Committee, therefore, recommend that Energy Audit concept being implemented since the couple of years, there is a need to review the execution of providing energy efficiency data in Audit Report by the companies and the implementation of energy audit concept.**

AT&C Losses

18. The Committee note that the Aggregated Technical and Commercial (AT&C) losses in the country is more than 25%. AT&C have two components, one technical losses which are due to energy dissipated in the conductors and equipment used for transmission, transformation and distribution of power while the other, commercial losses due to pilferage of energy by hooking of lines and bypassing the meters, defective meters, errors in meter reading, etc. In other words, more than 25% of the energy generated in the country is lost or goes unaccounted. The Committee believe that conversion of 25% losses in monetary loss will mean thousands of crores of rupees. The Committee also find that in comparison to international average, India's AT&C losses are too high. Technical losses can be reduced substantially by upgrading the existing old and inefficient transmission system in the country. Reduced AT&C losses, besides monetary gain, will also result in more availability of power for an energy deficient country. The power distributing sector has always been deprived of due investment and attention as compared to other two sectors of power, i.e., generation and transmission. The Committee are aware that the Government had taken an initiative to address this issue as early as in 2000-01 when the Accelerated Power Development and Reform Programme (APDRP) was launched which was later restructured and rechristened as the Re-structured APDRP. However, this also could not yield the desired results. Now, the Government have revamped the programme and re-launched it as the Indian Power Development Scheme (IPDS) which, besides other

things, aims at reducing AT&C losses to the level of 15%. The Committee do understand that this is a Herculean task and requires relentless efforts of the Centre as well as the cooperation of the States. Nonetheless, **they desire that though AT&C losses are separate subject. The Committee feels steps require to bring down the commercial 'pilferage'.**

NEW DELHI
August , 2015
Shravana....., 1937 (Saka)

DR. KIRIT SOMAIYA,
Chairman,
Standing Committee on Energy

(Vide para 7.4 of the Report)

List of State Designated Agencies

<p>Shri M Kamalakar Babu V.C. & Managing Director, New & Renewable Energy Development Corporation of A.P. Ltd.,(NREDCAP) 5-8-207/2, Pishgah Complex, Nampally, Hyderabad-500 001 Andhra Pradesh</p>
<p>Shri Marki Loya Director Arunachal Pradesh Energy Development Agency (APEDA) Urja Bhawan, Tadar Tang Marg Post Box No. 141, P.O. Itanagar-791 111, Dist. Papum Pare, Arunachal Pradesh</p>
<p>Shri Surajit Baroora Office of Chief Electrical Inspector-cum-Adviser Government of Assam 1st floor, West End Block, Housefed complex Basistha Road, Dispur Guwahati-781 003, Assam</p>
<p>Shri Dayanidhan Pandey Director Bihar Renewable Energy Development Agency (BREDA), 3rd Floor, Sone Bhawan, Birchand Patel Marg, Patna – 800 001</p>
<p>Shri S. K. Shukla Director Chhattisgarh State Renewable Energy Development Agency (CREDA) 2nd Floor, CSERC Building, Shanti Nagar, Raipur</p>
<p>Shri Vijaysinh A. Vaghela Director Gujarat Energy Development Agency (GEDA) 4th floor, Block No. 11 & 12 Udyog Bhavan, Sector-11, Gandhinagar - 382017 Gujarat</p>
<p>Shri N.N Reddy Superintending Engineer –I(S) & Nodal Officer-SDA Elect. Circle – I, Elect. Department, Margao, Goa</p>
<p>Shri Balraj Singh Director Renewable Energy Department ,Haryana &HAREDA, Akshay Urja Bhawan, Institutional Plot No.1,</p>

Sector 17,Panchkula – 134109 Haryana
Shri Ajay Sharma, IAS Director (Energy) Directorate of Energy(GoHP), Phase-III,Sector-VI,New Shimla Pincode -171009, Himachal Pradesh
Shri K.K Verma Director Jharkhand Renewable Energy Development Agency(JREDA) 328/B, Road No.- 4, Ashok Nagar, Ranchi , Jharkhand-834002.
Shri G.V Balaram Managing Director Karnataka Renewable Energy Development Limited (KREDL) 39, Shanthi Gruha, Bharath Scouts & Guides, Palace Road, Bangalore-560 001
Shri K. M. Dharsan Unnithan Director - Energy Management Centre - Kerala, Sreekrishna Nagar,Sreekaryam, Thiruvananthapuram – 695 017, Kerala
Smt. Gauri Singh Managing Director - MPUVNL Urja Bhawan, Link Road No. 2 Shivaji Nagar, Bhopal Madhya Pradesh - 462 016
Shri. Pravin C. Darade : IAS : 1997 Director General Maharashtra Energy Development Agency (MEDA) MHADA Commercial Complex, 2nd Floor, Opp. Tridal Nagar, Yerwada, Pune-411 006
Shri N. Sarat Singh Chief Engineer (Power) Office of the Chief Engineer (Power) Secretariat: Power Department Government of Manipur Manipur
Shri P.K. Shullet Senior Electrical Inspector Inspectorate of Electricity, Government of Meghalaya, Horse Shoe Building,Lower Lachumiere, Shillong – 793 001,Meghalaya
Shri Lalduhzuala Sailo Chief Electrical Inspector Power & Electricity Department, Electrical Inspectorate Government of Mizoram

Zuangtui, Aizawl – 796 017 Mizoram	
Er. Rokozhalie Angami Chief Electrical Inspector Old Assembly Secretariat Near Old Assembly Hostel Kohima-797001, Nagaland.	
Shri R.K Srivastav Section Officer Energy Efficiency And Renewable Energy Management Centre 2nd Floor, E-Block, Vikas Bhawan - II, Near GPO Building, Civil Lines, New Delhi-110055	
Shri S.S Pati Engineer- In – Chief (Electricity) – cum – Principal Chief Electrical Inspector & State Designated Agency Odisha, Department of Energy Government of Odisha Power House Square, Bidyut Marg, Bhubaneswar Odisha-751 001	
Shri Balour Singh Director Punjab Energy Development Agency (PEDA) Solar Passive Complex, Plot No. 1-2, Sector 33-D, Chandigarh (U.T.)-160 034	Dr. Amarपाल Singh, PCS Chief Executive Punjab Energy Development Agency (PEDA) Solar Passive Complex Plot No. 1-2, Sector 33-D, Chandigarh
Shri B.K Doshi Managing Director Rajasthan Renewable Energy Corporation Ltd (RRECL) E-166, Yudhishtir Marg, C-Scheme, Jaipur-302 005	
Shri D. P. Deokota Additional Chief Engineer cum Nodal Officer Sikkim SDA Energy & Power Department Government of Sikkim Gangtok	
Shri S. Appavoo Chief Electrical Inspector to Govt of Tamil Nadu Electrical Inspectorate Department , Government of Tamil Nadu Thiru Vi.Ka. Industrial Estate, Guindy, Chennai-600 032, Tamil Nadu	
Shri Bijoy Kumar Hrangkhawl Assistant General Manager (Planning) Tripura State Electricity Corporation Ltd. (TSECL) Bidyut Bhavan, North Banamalipur	

<p>Agartala – 799 001 Tripura</p>
<p>Shri Asheesh Joshi, IAS : 2006 Director Uttarakhand Renewable Energy Development Agency (UREDA) Urja Park Campus, Industrial Area Patel Nagar, Dehradun-248001 Uttarakhand</p>
<p>Shri A P Mishra Managing Director Uttar Pradesh Power Corporation Ltd (UPPCL) 3rd Floor, Shakti Bhawan Extn, 14, Ashok Marg, Lucknow - 226 001</p>
<p>Shri Madhu Sudhan Pal Chief Engineer : PTR Department & Chairman ECAT West Bengal State Electricity Distribution Co. Ltd. (WBSEDCL) Vidyut Bhawan, 4th Floor, Block-DJ, Sector II Bidhanagar (Salt Lake), Kolkata-700 091 West Bengal</p>
<p>Shri K.G Ravindran Executive Engineer Andaman & Nicobar SDA Electricity Department, A&N Administration Vidyut Bhawan, Port Blair – 744 101</p>
<p>Shri Rajinder Chaudhary SE (Electrical) Electrical Circle, Room No. 523, 5th Floor, Deluxe Building, U.T Sectt. Sector 9-D, Chandigarh-160 009</p>
<p>Shri Ravi Chander Superintending Engineer Electricity Division Office Union Territory of Lakshadweep, Kavaratti-682 555</p>
<p>Smt. N. Sumathi Managing Director Renewable Energy Agency of Pondicherry No. 10, Second Main Road, Elango Nagar, Puducherry - 605 011</p>
<p>Shri. Arun Kumar Mehta, IAS : 1988 Principal Secretary to Government Power Development Department, Civil Secretariat, Srinagar Jammu & Kashmir</p>

Shri M.R.Ingle
Executive Engineer,
Electricity Department,
Plot no 35, OI DC Corporate office
Near fire station, Somnath
Daman.

MINUTES OF THE ELEVENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 12TH FEBRUARY, 2015 IN COMMITTEE ROOM G-074, PARLIAMENT LIBRARY BUILDING, NEW DELHI.

The Committee met from 1130 hrs. to 1330 hrs.

PRESENT

LOK SABHA

Dr. Kirit Somaiya - **Chairperson**

2. Shri Om Birla
3. Shri M. Chandrakasi
4. Shri Ashwini Kumar Chaubey
5. Shri Harish Dwivedi
6. Shri Saumitra Khan
7. Dr. Arun Kumar
8. Shri Jagdambika Pal
9. Smt. Krishna Raj
10. Shri M.B. Rajesh
11. Shri Vinayak Bhaurao Raut
12. Shri Devendra Singh alias Bhole
13. Shri Malyadri Sriram
14. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

15. Shri Oscar Fernandes
16. Shri S. Muthukaruppan
17. Shri Ananda Bhaskar Rapolu
18. Dr. Anil Kumar Sahani
19. Smt. Viplove Thakur

SECRETARIAT

- | | | |
|------------------------|---|----------------------|
| 1. Shri Devender Singh | - | Additional Secretary |
| 2. Shri N.K.Pandey | - | Director |
| 3. Shri Arun K Kaushik | - | Additional Director |
| 4. Smt. L. N. Haokip | - | Under Secretary |

WITNESSES

MINISTRY OF POWER

- | | |
|---------------------------|-----------------|
| 1. Shri P. K. Sinha | Secretary |
| 2. Shri R.N.Choubey | Spl. Secretary |
| 3. Shri Devendra Chaudhry | Spl. Secretary |
| 4. Shri Satish Kumar | Joint Secretary |
| 5. Shri A.K. Singh | Joint Secretary |

CENTRAL ELECTRICITY AUTHORITY

- | | |
|------------------------|------------|
| 1. Shri Sandesh Sharma | CE (legal) |
|------------------------|------------|

PSU, AUTONOMOUS BODIES, STATUTORY BODIES, ETC.

- | | |
|--------------------|----------------|
| 1 Shri K.K. Sharma | Director, NTPC |
| 2 Shri Ajay Mathur | DG, BEE |

2. At the outset, the Chairman welcomed the Members of the Committee and the representatives of the Ministry of Power to the sitting of the Committee and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the Ministry of Power made a power point presentation on 'Energy Conservation'.

4. In course of the sitting, the Committee raised the following important points with the representatives of the Ministry of Power:

- i) The Energy Conservation (EC) Act, 2001 and subsequent amendment;
- ii) Issues relating to energy efficiency and energy conservation;
- iii) Mechanism to provide incentives to consumers to attract them towards energy conservation;
- iv) Issues relating to financial resources, the market, the production and manufacture;
- v) Energy audit; and

- vi) Initiatives/awareness programmes for promotion of energy efficiency and energy conservation.

Thereafter, the members sought clarifications on various issues relating to the subject and the representatives of the Ministry responded to the same. The Committee directed the representatives of the Ministry to furnish written replies to the queries which could not be responded to by them.

- 5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE FIFTEENTH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 17TH MARCH, 2015 IN COMMITTEE ROOM '139', PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee met from 1800 hrs. to 1945 hrs.

PRESENT

LOK SABHA

Shri Kirit Somaiya - **Chairperson**

2. Shri M. Chandrakasi
3. Shri Bhagat Singh Koshyari
4. Dr. Arun Kumar
5. Shri R.P. Marutharajaa
6. Shri Jagdambika Pal
7. Shri Ravindra Kumar Pandey
8. Shri Vinayak Bhaurao Raut
9. Shri Gutha Sukender Reddy
10. Shri Devendra Singh alias Bhole Singh
11. Shri Malyadri Sriram
12. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

13. Shri S. Muthukaruppan
14. Shri Ananda Bhaskar Rapolu
15. Dr. Anil Kumar Sahani

SECRETARIAT

1. Shri Devender Singh - Addl. Secretary
2. Shri N.K.Pandey - Director
3. Shri Arun K Kaushik - Additional Director
4. Smt. L.N. Haokip - Under Secretary

LIST OF WITNESSES

MINISTRY OF POWER

1. Shri Satish Kumar Joint Secretary
2. Dr. Ajay Mathur DG, BEE
3. Shri Saurabh Kumar MD, EESL

ELCOMA – ELECTRIC LAMP & MANUFACTURER ASSOCIATION

4. Shri Shyam Sujan Secretary General (ELCOMA)
5. Shri S.M. Dhiman President (Lighting –Surya Roshni Ltd.)

CREDAI – CONFEDERATION OF REAL ESTATE DEVELOPERS' ASSOCIATION OF INDIA

6. Shri Atul Kumar Rai CEO & DG
7. Shri Dilip Kumar Member

RAMA – REFRIGERATION AND AIR CONDITIONING MANUFACTURERS ASSOCIATION

8. Shri R.K. Mehta Executive Secretary
9. Shri Krishan Sachdev President

2. At the outset, the Chairman welcomed the Members of the Committee and the representatives of the Ministry of Power and the Private Manufacturers to the sitting of the Committee and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. The Chairman, then apprised them about the concerns of the Committee with regard to the Energy Efficiency and Conservation and requested them to give the initiatives taken by them in this aspect and also their suggestions on the issues involved. After introducing themselves

the representatives of the Private Manufacturers presented the various initiatives taken by them in their respective venture and also submitted their suggestions before the Committee on the subject one by one.

4. The Committee, thereafter, inter-alia discussed the following important points in connection with the examination of the subject:

- i) Issues relating to development/improvement of LED technology in India;
- ii) Issues relating to "Make in India";
- iii) Accreditation of more laboratories to expedite the certification process;
- iv) Stress on development of Energy Efficient Buildings;
- v) Energy Efficient Models of electronic gadgets;
- vi) Measures to make price, of energy efficiency products more affordable.

5. The Members sought clarifications on various issues relating to the subject and the representatives of the Ministry/Private Manufacturers responded to the same. The Committee desired that written replies to the queries which could not be responded to by them may be furnished.

6. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE 25TH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 17TH JUNE, 2015 IN COMMITTEE ROOM '62', PARLIAMENT HOUSE, NEW DELHI

The Committee sat from 1500 hours to 1630 hours.

PRESENT

Dr. Kirit Somaiya - Chairperson

LOK SABHA

2. Shri Om Birla
3. Shri Ashwini Kumar Chaubey
4. Shri Harish Dwivedi
5. Shri Bhagat Singh Koshyari
6. Kunwar Sarvesh Kumar
7. Dr. Arun Kumar
8. Shri Jagdambika Pal
9. Shri Ravindra Kumar Pandey
10. Smt. Krishna Raj
11. Shri M.B. Rajesh
12. Shri Vinayak Bhaurao Raut
13. Shri Gutha Sukender Reddy
14. Shri Devendra Singh alias Bhole Singh
15. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

16. Shri Oscar Fernandes
17. Shri Pyarimohan Mohapatra
18. Shri Javed Ali Khan
19. Shri Ananda Bhaskar Rapolu
20. Dr. Anil Kumar Sahani

SECRETARIAT

1. Shri Devender Singh - Additional Secretary
2. Shri N.K. Pandey - Director
3. Shri Arun K. Kaushik - Director

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of Power to the sitting of the Committee and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the Ministry of Power briefed the Committee on the subject 'Energy Conservation' through a Power Point Presentation covering the various issues involved. The Members raised certain queries which were answered to by the representatives of Ministry of Power.

4. The following important points were discussed during the sitting:

- i) Need for a detailed and specific action plan on the part of the Government to address the issue of energy conservation;
- ii) Measures to check the manufacturing of high consumption electric appliances, particularly the Bulbs which are in common use;
- iii) Strengthening of SDAs for ensuring better implementation of policies and schemes promoting energy conservation;
- iv) Need to undertake a survey in order to finding and comparing international standards for energy efficiency and conservation;
- v) Need to increase public awareness for energy conservation through targeted advertisements throughout the country;
- vi) Exploring the role of Renewable Energy in Energy Conservation.

5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE 26TH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 25TH JUNE, 2015 IN COMMITTEE ROOM 'B', PARLIAMENT HOUSE ANNEXE, NEW DELHI

The Committee sat from 1500 hours to 1710 hours.

PRESENT

Dr. Kirit Somaiya - Chairperson

LOK SABHA

2. Shri Om Birla
3. Shri Ashwini Kumar Chaubey
4. Shri Harish Dwivedi
5. Shri Saumitra Khan
6. Shri Bhagat Singh Koshyari
7. Kunwar Sarvesh Kumar
8. Dr. Arun Kumar
9. Shri Ravindra Kumar Pandey
10. Shri M.B. Rajesh
11. Shri Vinayak Bhaurao Raut
12. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

13. Shri Oscar Fernandes
14. Shri Pyarimohan Mohapatra
15. Shri Javed Ali Khan
16. Dr. K.P. Ramalingam
17. Shri Ananda Bhaskar Rapolu
18. Dr. Anil Kumar Sahani
19. Smt. Viplove Thakur

SECRETARIAT

1. Shri Devender Singh - Additional Secretary
2. Shri N.K. Pandey - Director
3. Shri Arun K. Kaushik - Director

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of Power, FICCI, CII, TATA Power, BSES and Indian Captive Power Producers Association to the sitting of the Committee and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the FICCI, CII, TATA Power, BSES and Indian Captive Power Producers Association briefed the Committee on the subject 'Energy Conservation' through a Power Point Presentation covering the various issues involved. The Members raised certain queries which were answered to by the representatives of Ministry of Power.

4. The following important points were discussed during the sitting:

- i) Need and scope for energy conservation;
- ii) Criteria and action plan for implementing Green Building Code;
- iii) Need for giving thrust to advertisement of energy efficient equipments;
- iv) Making energy efficient equipments available for agriculture sector;
- v) Need to make legal provisions for ban on old and high energy consuming heavy electric appliances;
- vi) Controlling of AT&C losses in order to save energy;
- vii) Focus on R&D for making more and more energy efficient appliances;
- viii) Need for surveys to collect relevant data on energy conservation – measure s and methods, throughout the country;
- ix) Need for distribution of LED Lights to consumers at mass scale.

5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE 27TH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 01ST JULY, 2015 IN COMMITTEE ROOM '53', PARLIAMENT HOUSE, NEW DELHI

The Committee sat from 1500 hours to 1730 hours.

PRESENT

Dr. Kirit Somaiya - Chairperson

LOK SABHA

2. Shri Ashwini Kumar Chaubey
3. Shri Saumitra Khan
4. Shri Bhagat Singh Koshyari
5. Dr. Arun Kumar
6. Shri Jagdambika Pal
7. Shri Ravindra Kumar Pandey
8. Smt. Krishna Raj
9. Shri M.B. Rajesh
10. Shri Vinayak Bhaurao Raut
11. Shri Gutha Sukender Reddy
12. Shri Devendra Singh alias Bhole Singh
13. Shri Bhanu Pratap Singh Verma

RAJYA SABHA

14. Shri V.P. Singh Badnore
15. Shri Oscar Fernandes
16. Shri Pyarimohan Mohapatra
17. Shri Javed Ali Khan
18. Dr. K.P. Ramalingam
19. Shri Ananda Bhaskar Rapolu
20. Dr. Anil Kumar Sahani
21. Smt. Viplove Thakur

SECRETARIAT

1. Shri Devender Singh - Additional Secretary
2. Shri Arun K. Kaushik - Director

LIST OF WITNESSES

MINISTRY OF POWER

1. Shri Satish Kumar Joint Secretary
2. Smt. Jyoti Arora Joint Secretary
3. Dr. Ajay Mathur DG, BEE
4. Shri Saurabh Kumar MD, EESL
5. Shri Gireesh B. Pradhan Chairperson, CERC
6. Smt. Shubha Sarma Secretary, CERC

UTTAR PRADESH

7. Mr. Ravindra Kumar Sharma Executive Director (Planning), UPPCL

MSEB

8. Shri Mukesh Khullar Principal Secretary, Government of Maharashtra
9. Shri Prabhakar Shinde Director (Project) State Electricity Dist. Co. Ltd.
10. Shri Hemantkumar H. Patil Manager (Energy Conservation)
11. Shri Prafulla Pathak Resident Manager

DISTRIBUTION COMPANY OF MAHARASHTRA

12. Shri Mahesh Kapileshwari Vice President, R. Infra
13. Shri Pramod Dev Additional Vice President, R.Infra
14. Shri Amol Bhutad Lead Engineer Tata Power Co. Ltd.
15. Shri M.B. Urunkar Asst. G.M. BEST

ANDHRA PRADESH

16. Shri A. Chandra Sekhara Reddy Chief Executive Officer

DELHI ELECTRICITY REGULATORY COMMISSION

17. Shri P.D. Sudhakar Chairman
18. Shri J.P. Singh Member
19. Shri B.P. Singh Member

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of Power, State Government of Uttar Pradesh, Maharashtra,

Andhra Pradesh, DERC, CERC and BEE and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the Ministry of Power, State Government of Uttar Pradesh, Maharashtra, Andhra Pradesh, DERC, CERC and BEE briefed the Committee on the subject 'Energy Conservation'. The Members raised certain queries which were answered to by the representatives of Ministry of Power.

4. The following important points were discussed during the sitting:

- i) Need and scope for energy conservation;
- ii) Criteria and Action Plan for implementing the Green Building Code in various States;
- iii) Need for giving thrust to advertisement of energy efficient equipment;
- iv) Making energy efficient equipment available to the agriculture sector;
- v) Need to make legal provisions for ban on old and high energy consuming heavy electric appliances;
- vi) Controlling of AT&C losses in the States in order to save energy;
- vii) Focus on R&D for making more and more energy efficient appliances and replacing non star or low star electric appliances by more efficient products;
- viii) Need for surveys to collect relevant data on energy conservation – measures and methods, throughout the country;
- ix) Need to extend the scheme launched for distribution of around 4 lakh LED Lights to cover maximum number of consumers;
- x) Need to launch a drive throughout the country to replace all the street lights by efficient LED lights.

5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE 28TH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 07TH JULY, 2015 IN COMMITTEE ROOM '53', PARLIAMENT HOUSE, NEW DELHI

The Committee sat from 1500 hours to 1645 hours.

PRESENT

Dr. Kirit Somaiya - Chairperson

LOK SABHA

2. Shri Ashwini Kumar Chaubey
3. Shri Harish Dwivedi
4. Shri Bhagat Singh Koshyari
5. Dr. Arun Kumar
6. Shri Jagdambika Pal
7. Smt. Krishna Raj
8. Shri M.B. Rajesh
9. Shri Purno Agitok Sangma
10. Shri Devendra Singh alias Bhole Singh
11. Shri Malyadri Sriram
12. Shri Bhanu Pratap SinghVerma

RAJYA SABHA

13. Shri Oscar Fernandes
14. Shri Pyarimohan Mohapatra
15. Shri S.Muthukaruppan
16. Shri Javed Ali Khan
17. Shri Ananda Bhaskar Rapolu
18. Dr. Anil Kumar Sahani
19. Smt. Viplove Thakur

SECRETARIAT

1. Shri N.K. Pandey - Director
2. Smt. L.N. Haokip - Under Secretary

LIST OF WITNESSES

MINISTRY OF POWER

- | | | |
|----|----------------------|-----------------------|
| 1. | Shri Satish Kumar | Joint Secretary |
| 2. | Smt. Jyoti Arora | Joint Secretary |
| 3. | Shri Major Singh | Chairperson, CEA |
| 4. | Dr. Ajay Mathur | DG, BEE |
| 5. | Shri Sanjay Seth | Secretary, BEE |
| 6. | Shri Saurabh Diddi | Energy Economist, BEE |
| 7. | Shri Arijit Sengupta | Energy Economist, BEE |
| 8. | Shri Saurabh Kumar | MD, EESL |

MINISTRY OF CORPORATE AFFAIRS

- | | | |
|-----|----------------------------|------------------|
| 9. | Ms. Anjuli Chib Duggar | Secretary |
| 10. | Shri Pritam Singh | Addl. Secretart |
| 11. | Shri Amardeep Singh Bhatia | Joint Secretary |
| 12. | Smt. Sibani Swain | Economic Adviser |

MINISTRY OF FINANCE (DEPTT. OF REVENUE)

- | | | |
|-----|-------------------|--|
| 13. | Shri Najib Shah | Spl. Secretary & Chairman (CBEC) |
| 14. | Shri A.K. Kaushal | Special Secretary & Members
(Customs) |
| 15. | Shri Alok Shukla | JS (TRU-I) |
| 16. | Ms. P.S. Saxena | JS (TPL-I) |

MINISTRY OF FINANCE (DEPTT. OF ECONOMIC AFFAIRS)

- | | | |
|-----|----------------------|-----------------|
| 17. | Ms. Sharmila Chavaly | Joint Secretary |
| 18. | Shri Abhijit Phukon | Joint Director |

MINISTRY OF FINANCE (DEPTT. OF EXPENDITURE)

20.	Shri A.N. Jha	Addl. Secretary
21.	Smt. Annie George Mathew	Joint Secretary
22.	Shri Arunish Chawla	Joint Secretary

MINISTRY OF URBAN DEVELOPMENT

23.	Shri Durga Shanker Mishra	Addl. Secretary
24.	Shri Sameer Sharma	Joint Secretary
25.	Shri Neeraj Mandloi	Joint Secretary
26.	Shri Praveen Prakash	Joint Secretary
27.	Shri Diwakar Garg	DG, CPWD
28.	Shri Rajendra Chaudhari	Director (Commercial) NBCC
29.	Shri P.K. Seth	Executive Director (PMG), NBCC

MINISTRY OF HOUSING AND URBAN POVERTY ALLEVIATION

30.	Dr. Nandita Chatterjee	Secretary (HUPA)
31.	Shri Sanjeev Kumar	Joint Secretary
32.	Dr. Shailesh Kumar Aggarwal	Executive Director, BMTPC

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of Power, Ministry of Corporate Affairs, Ministry of Finance, Ministry of Urban Development and Ministry of Housing and Urban Poverty Alleviation and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. All the witnesses introduced themselves to the Committee. Thereafter, the representatives of the Ministry of Urban Development made a powerpoint presentation on the subject 'Energy Conservation'. The Members raised certain queries which were answered to by the representatives of Ministries.

4. The following important points were discussed during the sitting:

- i) Need and scope for energy conservation;
 - ii) Criteria and Action Plan for implementing the Green Building Code;
 - iii) Need for giving thrust to advertisement of energy efficient equipment;
 - iv) Detailed Action Plan for giving thrust to Energy Conservation in the upcoming Smart Cities launched under 'AMRUT';
 - v) Need for a National Clean Energy Fund for promoting energy conservation;
 - vi) Disbursement of Funds in required time-frame and inadequate allocation for energy efficient projects;
 - vii) Focus on R&D for making more and more energy efficient appliances;
 - viii) Need for surveys to collect relevant data on energy conservation – measures and methods, throughout the country;
 - ix) Financial Support to various Schemes and Programmes relating to Energy Conservation.
5. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.

MINUTES OF THE 29TH SITTING OF THE STANDING COMMITTEE ON ENERGY (2014-15) HELD ON 14TH JULY, 2015 IN COMMITTEE ROOM '53', PARLIAMENT HOUSE, NEW DELHI

The Committee sat from 1100 hours to 1240 hours.

PRESENT

Dr. Kirit Somaiya - Chairperson

LOK SABHA

2. Shri Om Birla
3. Shri M.Chandrakasi
4. Shri Deepender Singh Hooda
5. Shri Bhagat Singh Koshyari
6. Kunwar Sarvesh Kumar
7. Shri Jagdambika Pal
8. Shri Ravindra Kumar Pandey
9. Shri M.B. Rajesh
10. Shri Vinayak Bhaurao Raut
11. Shri Gutha Sukender Reddy
12. Shri Purno Agitok Sangma
13. Shri Bhanu Pratap SinghVerma

RAJYA SABHA

14. Shri V.P. Singh Badnore
15. Shri Oscar Fernandes
16. Shri Ram Jethmalani
17. Shri Pyarimohan Mohapatra
18. Shri S. Muthukaruppan
19. Shri Javed Ali Khan
20. Shri Ananda Bhaskar Rapolu

SECRETARIAT

1. Shri N.K. Pandey - Director
2. Shri A.K. Kaushik - Director
3. Smt. L.N. Haokip - Under Secretary

LIST OF WITNESSES

MINISTRY OF POWER

1.	Shri P.K. Pujari	Secretary
2.	Shri Satish Kumar	Joint Secretary
3.	Shri B.K. Sharma	Chief Engineer, CEA
4.	Shri T.K. Barai	Member (Thermal) CEA
5.	Dr. Ajay Mathur	DG, BEE
6.	Shri Sanjay Seth	Secretary, BEE
7.	Shri Arijit Sengupta	Asstt. Energy Economist, BEE
8.	Shri Saurabh Kumar	MD, EESL
9.	Smt. Shubha Sarma	Secretary, CERC

2. At the outset, the Chairperson welcomed the Members of the Committee and the representatives of the Ministry of Power and made known to them the provisions of Directions 55(1) and 58 of the Directions by the Speaker.

3. After introducing themselves to the Committee, the representatives of the Ministry of Power made a powerpoint presentation on the subject 'Energy Conservation'. The Members raised certain queries which were answered to by the representatives of Ministry of Power.

4. The following important points were discussed during the sitting:

- i) Need and scope for energy conservation;
- ii) Criteria and Action Plan for implementing the Green Building Code;
- iii) Need to consider the applicability of different time zones in the country for conservation of energy;
- iv) Making energy efficient equipment available for the agriculture sector;
- v) To review the scope of Energy Audit and to make it a regular mechanism;
- vi) Increasing the number of testing labs for efficient electrical appliances;

- vii) Need for distribution of LED Lights to consumers on a mass scale.
- viii) Need to give thrust to R&D activities in the sector.
- ix) Need to reduce AT&C losses in pursuit of Energy Conservation.

5. The Chairperson then thanked the representatives of Ministry of Power for giving valuable information to the Committee on the subject and also asked them to furnish detailed notes on their Action Plan concerning energy conservation, Energy Audit and various initiatives taken by the State Governments on the issue.

6. The verbatim proceedings of the sitting of the Committee were kept on record.

The Committee then adjourned.