

STATE DESIGNATED AGENCIES (SDAs)

Second Prize

State Designated Agencies

ENERGY MANAGEMENT CENTRE

Thiruvananthapuram (Kerala)

Introduction

Energy Management Centre is an autonomous body functioning under the Department of Power, Government of Kerala. The objectives of the Center are to facilitate efficient management of all forms of energy, to promote energy efficiency and energy conservation as well as novel energy technologies to increase productivity, improve quality of life and facilitate overall development on a sustained basis. EMC strives to achieve the said objectives through a range of activities encompassing research, training and demonstration projects. The centre is also active in the development of small hydel projects. A group of technologist is also working for SHP Projects in association with engineers deputed from Kerala Electricity Board.

The major activities carried out by EMC includes

- ✓ Development of Energy Monitoring and Control equipments.
- ✓ Energy Efficiency Improvement in Small and Medium Industries.
- ✓ Education and Training programme for different end user group.
- ✓ Development of conducting awareness programme.
- ✓ Organizing energy conservation award for various end-users.

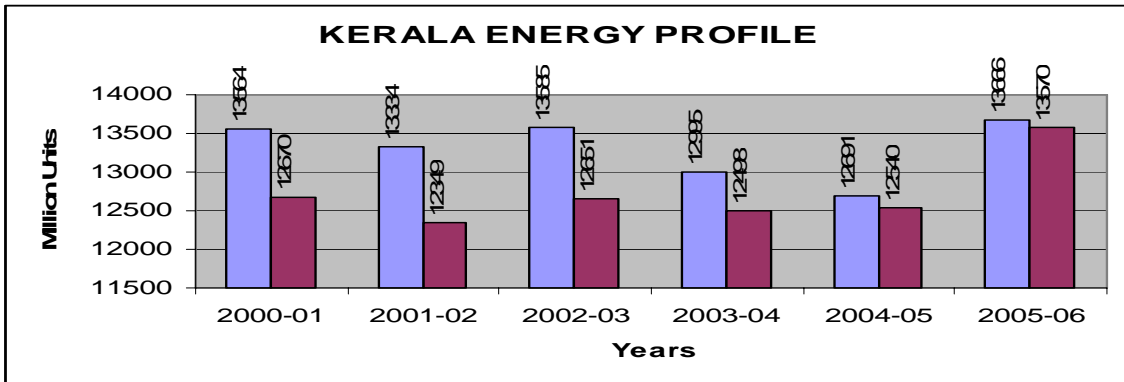
Profile and Energy scenario of Kerala



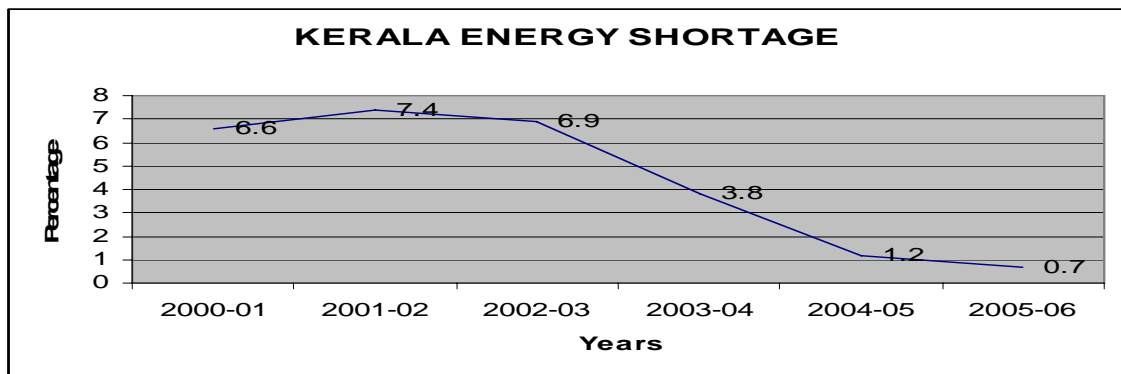
Kerala is located in the southern region of India with an area of 38863 sq. km and 14 districts. Kerala shares the border with Indian States of Karnataka, Tamil Nadu. Main language spoken in Kerala is Malayalam. Kerala is having a total population 31.83 million (2001 Census) with density of population of 749 per Sq. km.

Kerala Energy Profile

The energy requirement of Kerala and actual energy supplied during last six years is shown below:

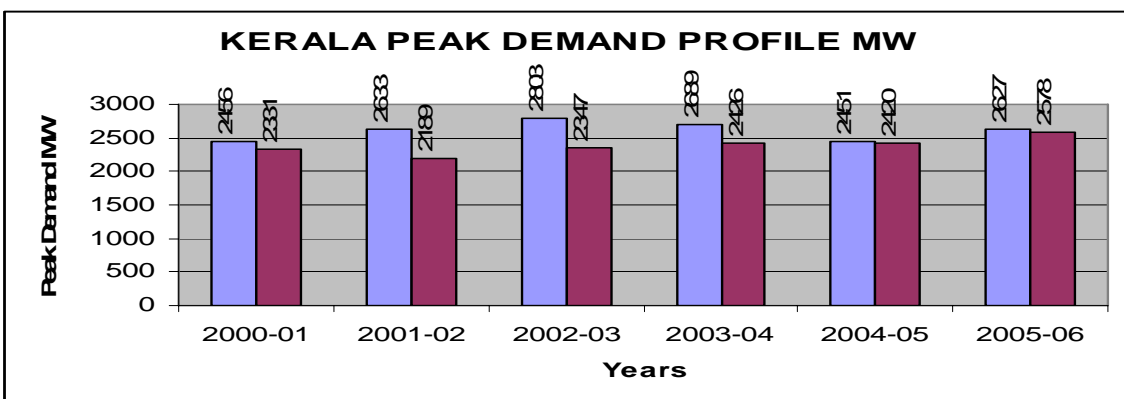


The energy shortage in Kerala is progressively decreasing. The energy shortage during the above period is given below:

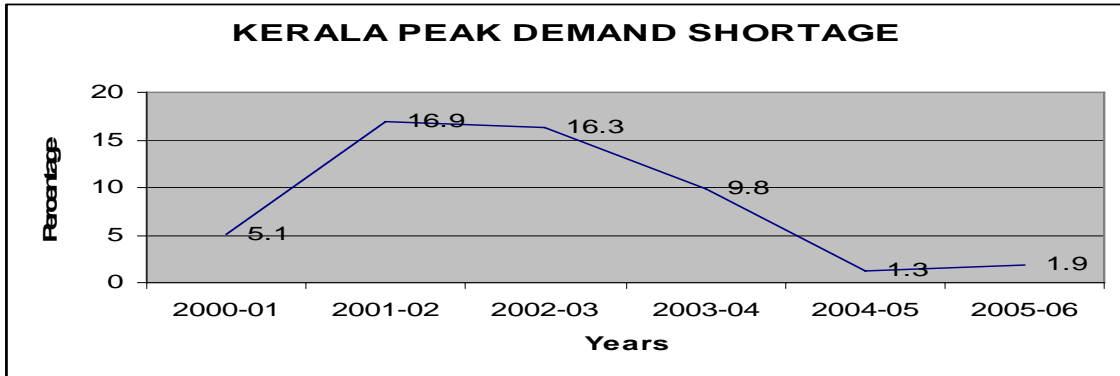


Kerala Peak Demand Profile

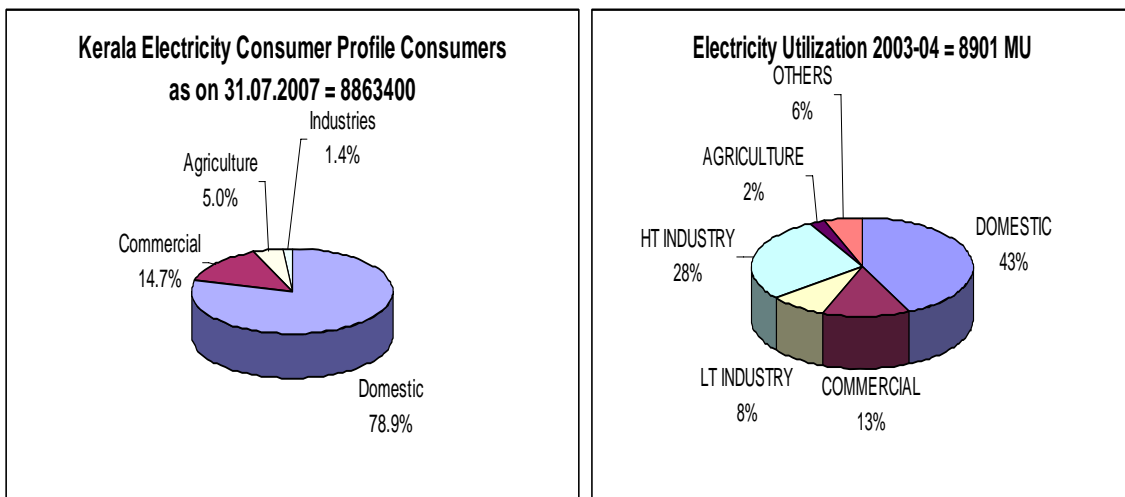
The peak demand requirement of Kerala and actual peak demand supplied during last six years is shown below:

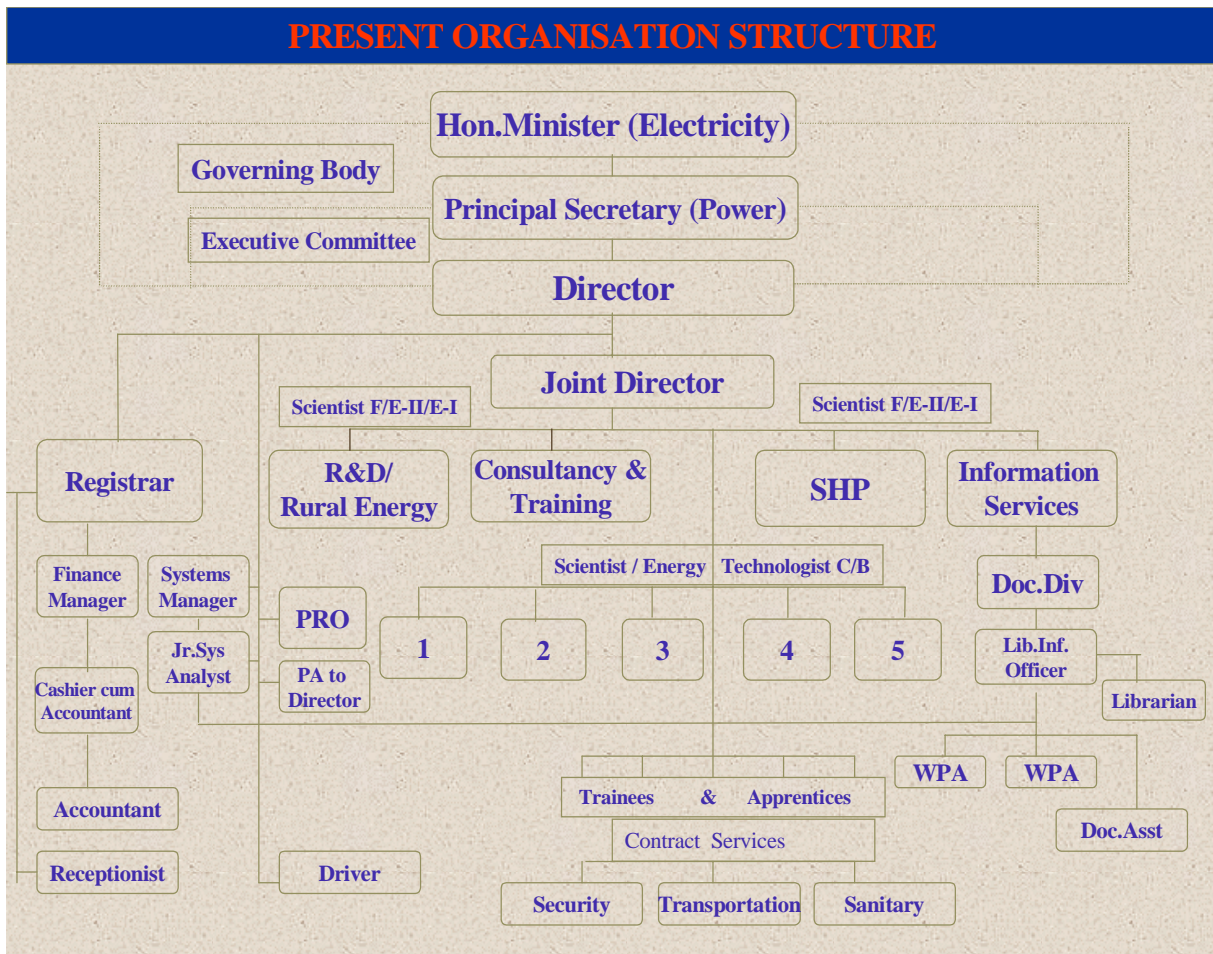


The peak demand shortage in Kerala is steadily decreasing. The peak demand shortage during the above period is given below:



It can be noted that Domestic Sector consumes more than 43% of the energy. The Commercial Sector requirement is 13% of State's Electrical Energy requirement. Low Tension and High Tension Industrial requirement is about 36%.





List of Activities undertaken by SDA in 2007- 08

1. Energy Efficiency improvement studies

The Centre has been conducting Research and Development Activities related to efficiency improvement in SMEs and energy efficient monitoring systems for industries and also for the development of energy efficient cooking aids etc.

2. Automatic street light switching devices

EMC has successfully developed an almanac fed electronically controlled switching device for switching on and switching off street lights. The switching device is capable of carrying 16 A current with setting arrangements. 5 systems are developed and are under testing at Kochi.

3. Energy Conservation Programmes

➤ Industrial Sector

Energy Audit Services

Against the request from some of the enterprises in the state, EMC commissioned energy efficiency improvement studies in the following units; summary of the study findings has been presented in the table below.

1. Steel and industrial forging limited.
2. Friends Jana Sevana Krendram.
3. Kerala Hitech Industries Limited.
4. KINFRA
5. Kerala State Science & Technology Museum & Priyadharsini Planetarium.

Sl. No	Name	Sector	Annual Electrical Energy Saving (kWh)	Identified Electrical Energy % Savings	Monthly Demand Reduction	Annual Thermal Energy Savings	Identified Thermal Energy% Savings	
1	Steel and Industrial forging limited	Industry	15,81,143	12.8 %	110	140 KL	16	
2	Friends Jana Sevana Krendram	Commercial Complex	11481	14.5%	-			
3	Kerala Hitech Industries Limited	Industry	2,25,568	17.96%	75	-	-	
4	KINFRA	Electrical Distribution System Audit						
5	Kerala State Science & Technology Museum & Priyadharsini Planetarium	Power Factor Improvement Study						

4. Industry programme on energy conservation (IPEC)

Organized an Energy Efficiency Capacity Building training programme for Engineers in Industries at Kottayam in association with IRG Systems from 19.09.07 to 20.09.07. Organized a two day Energy Efficiency Capacity Building training programme for Engineers in Industries at Palakkad in association with IRG System from 21.09.07 to 22.09.07

5. Public sector undertaking capacity building program for energy managers- Phase 1, Phase 2 and Phase 3

Bureau of Public Enterprises, Government of Kerala (BPE) and Energy Management Centre- Kerala (EMC), who is the State Designated Agency (SDA) in implementing Energy Conservation Act, 2001 in Kerala have jointly undertaken a capacity building programme for Kerala PSUs in energy management.

6. For energy professionals

Refresher training programme for energy managers and energy auditors

7. Commercial sector – energy conservation in buildings

Building sector consumes major portion of the energy in the State. EMC organized various programmes to improve the energy efficiency in this sector.

8. Demand side management programme at Kochi

In order to showcase the potential of DSM for reduction in the peak load, EMC has conducted studies at Santhipuram and other areas in Kochi.

The implementation of the Programme involved the following

- Awareness programmes
- Energy audit
- Repositioning of street lights
- Energy Conservation Programmes in Government Buildings
- Introduction of CFL at Santhipuram, saving achieved is 25%

9. Energy Efficiency campaign and publicity- awareness creation General Public

EMC has organized more than 21 large scale awareness programmes in different part of the State for the following categories

- **House- wives (Energy Clinic)**
- **Energy conservation among school children**
- **Competitions for school children on energy conservation**

10. Exhibitions

EMC in association with different agencies organized the following exhibitions of Energy efficient equipments and conservation at:

- Nedumkandam, jointly organized by EMC and Nedumkandam Cultural Society from 14.04.07 to 22.04.07
- Public Library Trivandrum for Students on 24.04.07
- “Enterprises Kerala” organized by Kerala Small Industries Association at Thiruvananthapuram from 27 to 31 December 2008

- University College, Thiruvananthapuram, organized by Students Union, University of Kerala from 25- 28 January 2007.
- Gandhiji Study Centre, Thodupuzha from 21 to 31 December 2007

In connection with Energy Conservation month, EMC organized various Programmes in all the 14 districts.

11. Publication and publicity on energy conservation

EMC published posters and brochures to propagate and popularize the message of Energy Conservation among the general public. Recently EMC gave 2000 copies of posters and nearly 1 Lakh brochures to KSEEB for distribution.

EMC through the support of different Public Library is distributing brochure to general public to spread the message of Energy Conservation in their locality. Posters giving energy conservation messages are also exhibited in this library. 250 library is covered in the first phase. The Second phase of 250 library is in the process. In support of this, EMC has provided a 18 W CFL to these libraries.

EMC has developed TV spot and is airing through different visual media. Adequate energy conservation awareness coverage has been provided print media.

12. State energy conservation awards

Hon'ble Chief Minister Shri. V.S Achuthanandan presented the State Energy Conservation Awards instituted by Government of Kerala in recognition of meritorious effort in the field of Energy Conservation in seven categories at Thiruvananthapuram on the National Energy Conservation Day, 14 December 2007. Participated organizations for the Award has saved 60 Million units equivalent to a project of 11 Mega Watt capacity, there by they saved nearly 55 crores of Rupees – Chief Minister Pointed out.

The quantified Energy Savings for the year 2007- 08 is 11Mw/ Year and a furnace oil savings of 1303.87 MT/ year.

Summary of energy savings achieved by industrial units participating in the energy management centre's energy conservation award schemes

Year	No. of Participating Industrial Units	Savings/ Yr Rs. Lakhs	Investment Rs. Lakhs	Electrical Energy Savings		Furnace oil saving MT/ yr	Coal savings MT/ yr
				Million kWh/ yr	Equivalent avoided Capacity (MW)		
2007	21	1914.63	1097.95	59.735	11.34	1303.87	
2006	27	2343.1	4080.3	40.00	7.61	6665	2870
2005	17	839.3	1654.5	23.52	4.48	850	0
2004	12	873.8	1087.2	12.82	2.44	3170	5558
2003	9	1745.9	7640.8	32.32	6.15	8169	6433

List of Notifications / Regulations issued for Energy Conservation activities in the state till the year 2007- 2008

1. Government Order No: G.O (MS) No. 12/ 92/ PD dated: 30/ 5/ 1992
2. The government has made Energy Audit mandatory in order to regulate the consumption and use of electrical energy.
3. 2.Government Order No: G.O (MS) No. 31/ 2001/ PD dated Thiruvananthapuram dated 2/ 11/ 2001 .The Government has constituted the State Level Committee for monitoring the Energy Conservation Activities in the state for a period of 3 years.
4. Government Order No: G.O (MS) No. 1/96/ PD dated Thiruvananthapuram dated 19/ 01/ 1996 Government Order for Setting up an Energy Management Centre in the State- Sanctioned – Orders issued.
5. Government Order No: G.O (MS) No. 24/ 97/ PD dated Thiruvananthapuram dated 11/ 6/ 1997 .The Government has constituted the State Level Committee for monitoring the Energy Conservation Activities in the state for a period of 3 years.
6. Government Order No: G.O (MS) No. 39/ 05/ PD dated Thiruvananthapuram dated 7/ 10/ 2005.The Government has constituted the State Level Committee for monitoring the Energy Conservation Activities in the state for a period of 3 years.
7. Government Order No: G.O (MS) No. 27/ 2008/ PD dated: 08/ 08/ 2008.Government has ordered that all heads of Departments and other Chief Executives of all Public Sector Undertakings should strictly implement the Energy Saving Measures to reduce the energy consumption to the tune of 10% initially.
 - Energy Policy of the state as per the G.O (MS) No.16/ 2002/ STED Dated, Thiruvananthapuram: 03.04.2002 (Energy Policy is annexed 2)
 - Use of Energy Conservation Devices is Made Mandatory
 - Fluorescent and Compact Fluorescent Lamps (CFL) are made mandatory in all new Hospitals, Hotels, Government Offices and Offices of Public Sector undertakings. In the case of existing Hospitals, Hotels, Government Offices and Offices of Public Sector undertakings, where incandescent lamps are used at present, the same should be replaced by Fluorescent and Compact Fluorescent Lamps of prescribed quality within a period of 2 years from the date this policy comes into force. ANERT should ensure this with the help of Local Self- Government and other Government organizations.
 - Solar Water Heating Systems are made mandatory in all Lodges and Hotels having 10 or more rooms and in hospitals with 20 beds or more.
 - Energy Efficient devices such as, improved Community Chulhas, Gasifiers, etc. are made mandatory in all Hotels, Hostels and Schools with noon meal scheme and in all industries where firewood is used as a fuel.
 - Quality control of Renewable energy and Energy Saving Devices to test all devices/ equipment related to renewable energy and energy saving devices for quality.
 - Mandatory Captive Power Plants- Large Industries having 2000 KVA and above as connected load, should produce at least 5 per cent of their requirement through captive power plants using Renewable Energy Sources.
 - Green Pricing – Choice of Green Pricing is given to interested customers, who choose to pay extra for the energy generated from Renewable Energy Sources (Green Energy).
8. Strategic Plan for Energy Efficiency Activities of EMC submitted for approval

Second Prize

State Designated Agencies

**RENEWABLE ENERGY DEPARTMENT, HARYANA
AND
HARYANA RENEWABLE ENERGY DEVELOPMENT AGENCY (HAREDA)
Chandigarh**

Introduction

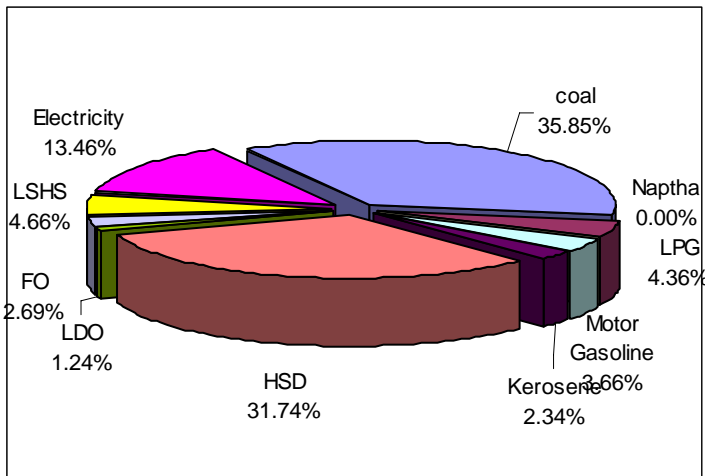
Department of Renewable Energy, Haryana, has been appointed as a State Designated Agency (SDA) for implementing the energy conservation act in the State. It was established in May, 1995 and is the nodal department for the state of Haryana for renewable Energy, Demand side management and Energy conservation programmes.

Profile and Energy Scenario of Haryana

Haryana is situated in the northern region of India with an area of 44,212 sq.km and 20 districts. Haryana Share its boundary with Delhi, Punjab, Himachal Pradesh, Uttar Pradesh, Uttaranchal and Rajasthan. Main language spoken in Haryana is Hindi and English. The total population of Haryana is 21.08 million (2001 Census) with density of population of 477 per km.



Haryana Energy Profile:

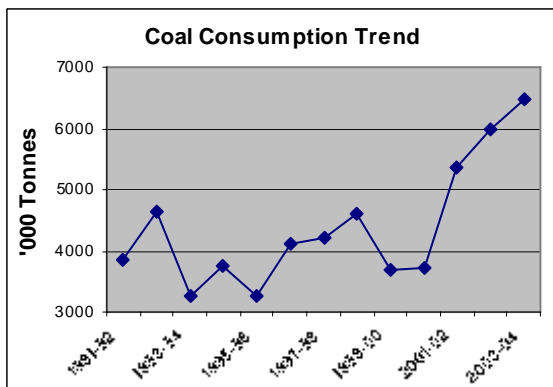


Reference: Energy, May 2005, CMIE, India

consumption. HSD is the next major energy consuming product in the state and contributes to 31.74% of the total energy consumed in the state. As per the trend shown in the graph for major petroleum products,

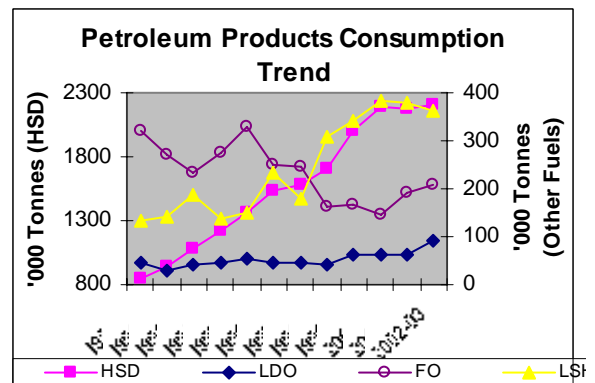
The state consumes about 7.13 Million tonne of oil equivalent (MTOE) of energy which is less than 3% of the total energy consumption in India. Coal and HSD are the major contributors in the energy consumption of the state and is equivalent to 35.85 % and 31.74% of the total energy consumption of the state respectively. Coal, HSD and Electricity contributes to the 81% of the total energy consumption as shown in the energy mix graph.

Consumption of coal has some fluctuations up to 2000-2001 and has sharp rise in consumption in the year 2001-2002 and 5.9 Million Tones of coal was consumed in the year 2002-03 which is the highest figure from past 12 years in the state



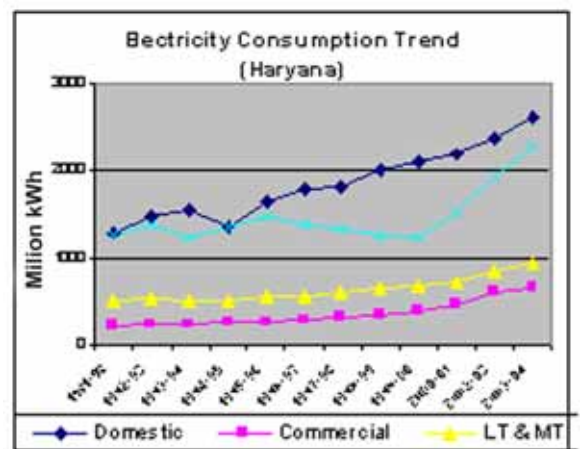
Reference: Energy, May 2005, CMIE, India

HSD consumption has marginal rise in every year whereas FO has shown fluctuations but overall it has shown a downward trend .LSHS has also shown fluctuations in consumption but it has shown an upward trend from the year 1998-1999 .LDO hasn't showed much variations in its consumption pattern.



Reference: Energy, May 2005, CMIE, India

Electricity has share of 13.46% of the total energy consumption in the state which is equivalent to 11.7 Billion units of electricity. Agriculture sector is the major contributor for the consumption of electricity and is about 44.06% of the total electricity consumed in the state. Next biggest consumers of the electricity are the domestic and industrial sector which are having share of 20.2 and 16.4% respectively. As far as the trend depicted in the graph Commercial and LT consumers have marginal rise in their consumption every year where as sectors like Domestic and HT has shown variations in the initial years but has showed upward trend in the recent years.



Reference: Energy, May 2005, CMIE, India

List of Activities undertaken by SDA in 2005-2008

- To play the leaders role, Haryana is the first State in the Country to have launched a programme for replacement of Conventional bulbs and 40 watt conventional Tube lights with CFLs & Energy Efficient T-5 (28 watt) Tube lights in all Haryana Govt. Buildings/ Boards/ Corporations/ Govt. aided Institutions.
- Massive Awareness Campaign using Electronics & Print Media, Seminars and Bus Back Panels has been launched in the State. HAREDA designed a multi- pronged strategy under which specific campaigns have been launched to target the General Public/ Rural Public, School Children, Farmers etc.
- Media Plan Prepared.
- Establishment of Internet Platform for Communication with SDA.
- Preparation of list of designated consumers and their energy consumption, list of certified energy managers and accredited energy auditors, who work or reside in the State.
- Energy Audit of Haryana Raj Bhawan, Chandigarh and Panipat Sugar Mills Limited and 10 Govt. Buildings, completed. Besides this, energy audit of 15 other industrial establishments has also been completed in Haryana.
- For Energy Efficiency in Agriculture Sector, a scheme has been launched for incentivising use of Energy Efficient ISI marked Pump Sets. Till March 2008, 3308 Nos. of energy efficient ISI marked Pump sets have been installed leading to an energy saving of 5.95 MW equivalents to 4485.8 MTOE per annum.
- Annual State level conference of energy intensive industry, as well as certified energy managers and energy auditors with award for all categories (EC Day & Awards)
- Half yearly meeting for exchange of information about lessons learnt with the Implementation of EC Act in the State.
- Annual meeting of all SDAs to discuss the progress and next year's action plan with BEE.
- Design and Printing of promotional material to be distributed to all stakeholders.
- Training of stake Holders & Designated Consumers for EC Act and Annual Reporting of energy data. Besides organizing the State Level Energy Workshop on 18/12/2207 at Chandigarh for the Stakeholders, District Level workshops on Energy Conversation Act 2001 were organized in 14 districts of the State by March 2008.As on date District Level Seminars have been organized in all the 20 districts of the State.
- Annual Year Book, Survey & Analysis of impact of EC Act, Pilot and demonstration projects on Municipal pumps, Street lights, Co-gen & EE in Agriculture Pumps.
- Survey of buildings at State level which fall under EC Act.
- Preparation of report & analysis of State level incentives and preparation of recommendations for streamlining State level policies.
- Proposal for setting up Energy Information Centers in Haryana was prepared and submitted to the BEE. The Proposal envisages of providing energy efficiency advisory serves to the masses with a self sustainable business model. The project is being developed in collaboration with the ADEME, France.

Implementation of the EC measures have been resulted in energy savings equivalent to 65160.32 MTOE

Energy Saved by carrying out the EC Activities (2007- 2008)

Particulars	Capacity	Quantum	Status	Energy Savings In MW	In MTOE Per Annum
Agriculture Pump Sets (1800 Watt)	1800 Watt	3308 Nos	Installed	5.95	4485.8
Street Lighting under SPV Lighting Programme (11 Watt)	11 Watt	3789 Nos	Installed	0.042	31.4
SPV Power Plant (2.7 KW) under SPV Lighting Programme	2700 Watt	21 Nos	Commissioned	0.057	42.7
Street Light under SPV Urban Area Programme (18 Watt)	18 Watt	1171 Nos	Installed	0.021	15.9
Solar Blinkers (37 Watt) Under SPV Urban Programme	37 Watt	320 Nos	Installed	0.012	8.9
Solar Traffic Signals (500 Watt) under SPV urban Programme	500 Watt	24 Nos	Installed	0.012	9.0
SPV Power Plant(5 KW) under SPV urban Programme	5000 Watt	14 Nos	Commissioned	0.070	52.7
Electrification of additional 149 Hamlets			In Progress	0	0
Use of CFLs (18 Watt) in various Districts (Benefit: 12Watt)	18 Watt	20266 Nos	Implemented	0.24	183.2
Use of CFLs (15 Watt) in various Districts (Benefit: 25 Watt)	15 Watt	45200 Nos	Implemented	1.13	851.3
Use of Energy Efficient T-5 Tube Lights (28 Watt) in Various Districts (Benefit: 12 Watt)	28 Watt	3607 Nos	Implemented	0.043	32.6
Use of CFLs by power utilities (Benefit: 12 Watt)	15 Watt	672000 Nos	Implemented	16.80	12656.4
Use of CFLs in private sectors (Benefit: 25 Watt)	15 Watt	1860000 Nos	Implemented	46.50	35031.2
Distribution of CFLs under Lamp Bachat Lamp Yojana (20 Watt) (Benefit: 20 Watt)	20 Watt	540000 Nos	Implemented	10.80	8136.3
Use of Box type solar cookers		22721	Implemented	Not	
Use of Dish Type Solar Cookers		4129 Nos	Implemented	Not	
Solar Water Heating system (245595 LPD) (Benefit:580 Kcal per hr for a 100 LPD system considering 4 hours usage per day for 200 sunny days at 60 deg C water temperature)		266 Nos	Installed	0.42	28.7
Building Design Modifications under the solar passive Architecture Programme			In progress		
Energy Savings through Energy Audits in Industries/ Govt. & Commercial Establishments		3594 MTOE	Energy Audits Completed		3594.0
Total				82.1	65160.32

List of Notifications/ Regulations issued for Energy Conversation activities in the State till the year 2007- 08

1. Haryana Govt. Gazette Notification No. 22/ 52/ 2005-5P dated 29/7/ 2005 for
 - a. Mandatory use of Solar Water Heating Systems
 - b. Mandatory use of Compact Fluorescent Lamp (CFL) in Govt. Buildings/ Govt. aided Institutions/ Boards/ Corporations
 - c. Mandatory use of ISI marked motor pump sets, power capacitors, foot/ reflex valves in Agriculture sector
 - d. Promotion of energy efficient building design in Govt. Sector
2. Haryana Govt. Gazette Notification No 22/ 52/ 2550- 5P (RE) dated 31/ 10/ 2005 on constitution of the State Level Monitoring Committee under the Chairmanship of the Chief Secretary, Haryana to monitor implementation of Energy Conversation Measures as well as Energy Conversation Act 2001.
3. Haryana Govt. Gazette Notification No. 22/ 52/ 05- 5P dated 7/09/2006 for mandatory use of T-5 (28 watt) energy efficient tube light system/ retrofit assembly in Govt. Buildings/ Govt. aided institutions/ Boards/ Corporations.
4. An Energy Conversation Action Team (ECAT) has been constituted under the Chairmanship of Financial Commissioner and Principal Secretary, Renewable Energy Department vide Haryana Govt. Order No. DRE/ECAT/2007/ 2020- 2027 dated 17/ 9/ 2007 for formulation on State Energy Conversation Action Plan.
5. Power Utilities have issued directions to their field offices for compliance of the Haryana Govt. Gazette Notification dated 29/ 7/2005 regarding mandatory use of CFLs and ISI marked motor pump sets in agriculture sector.
6. HAREDA has issued directions vide Memo No. DRE/2007/ 4720- 4919 dated 13/ 11/2007 for Standards and Star Rating of Products for Conversation of Energy
7. Guidelines on replacement of existing lighting fixture (ordinary bulbs & tube lights) with energy efficient lighting (CFLs & T-5 Energy Efficient Tube Lights) in Govt. establishments / buildings/ departments/ boards/ agencies, issued vide Memo No. 3310- 3511 dated 14/ 9/ 2007