



SANCHAR BHAWAN

(Ministry of Communication & IT)

Maintenance Retrofits Measures

(Carried out in house)

Sanchar Bhawan

(Brief overview)

- **Houses the offices of Hon'ble MOC&IT, Hon'ble MOS(C&IT), Secretary (Telecom) and attached offices of Deptt. Of Telecom**
- **The building has a basement, mezzanine and 14 floors**
- **Three Exchanges installed in mezzanine & 13th floor operating round the clock**
- **Energy Audit of Sanchar Bhawan conducted by BEE in March 2003**
- **Carpet Area 19150 sqmtrs**
AC Area 6560 sqmtrs
Non-AC Area 12590 sqmtrs
- **Total Connected Load 2066 kW**

TECHNICAL FEATURES

- **Total Built up Area (in Sq. Meters) 19150**
- **Air-conditioned area (in Sq. Meters) 6560**
- **Non-Air-conditioned area (in Sq. Meters) 12590**
- **Total carpet Area (in Sq Meters) 19150**
- **Total connected load in (kW) 2066**
 - a) **Lighting(kW) 130**
 - b) **Space cooling (air conditioning) (kW) 1327**
- **Window air conditioners (kW) 767**
- **Central air conditioners (kW) 560**

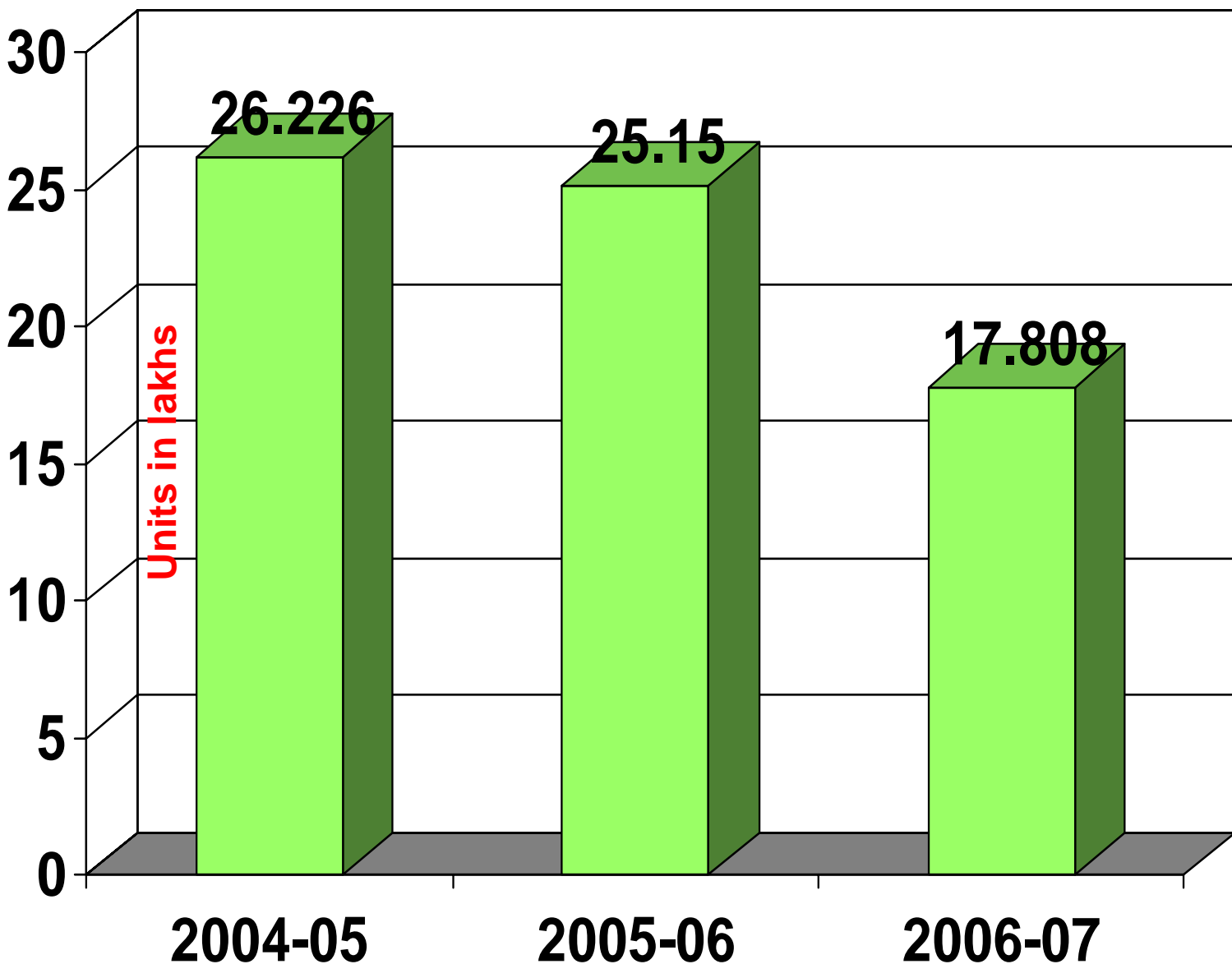
RESULTS

Energy conservation measures incorporated in Sanchar Bhawan building resulted into savings of 7.34 lakh units (kwh) and electricity bill charges reduction of Rs. 29.81 lakhs during 2006-07 as compared to previous year. Savings of Rs. 39.93 Lakhs as compared to base year 2004-05

Specific energy consumption (SEC) reduction achieved (kWh/kW)

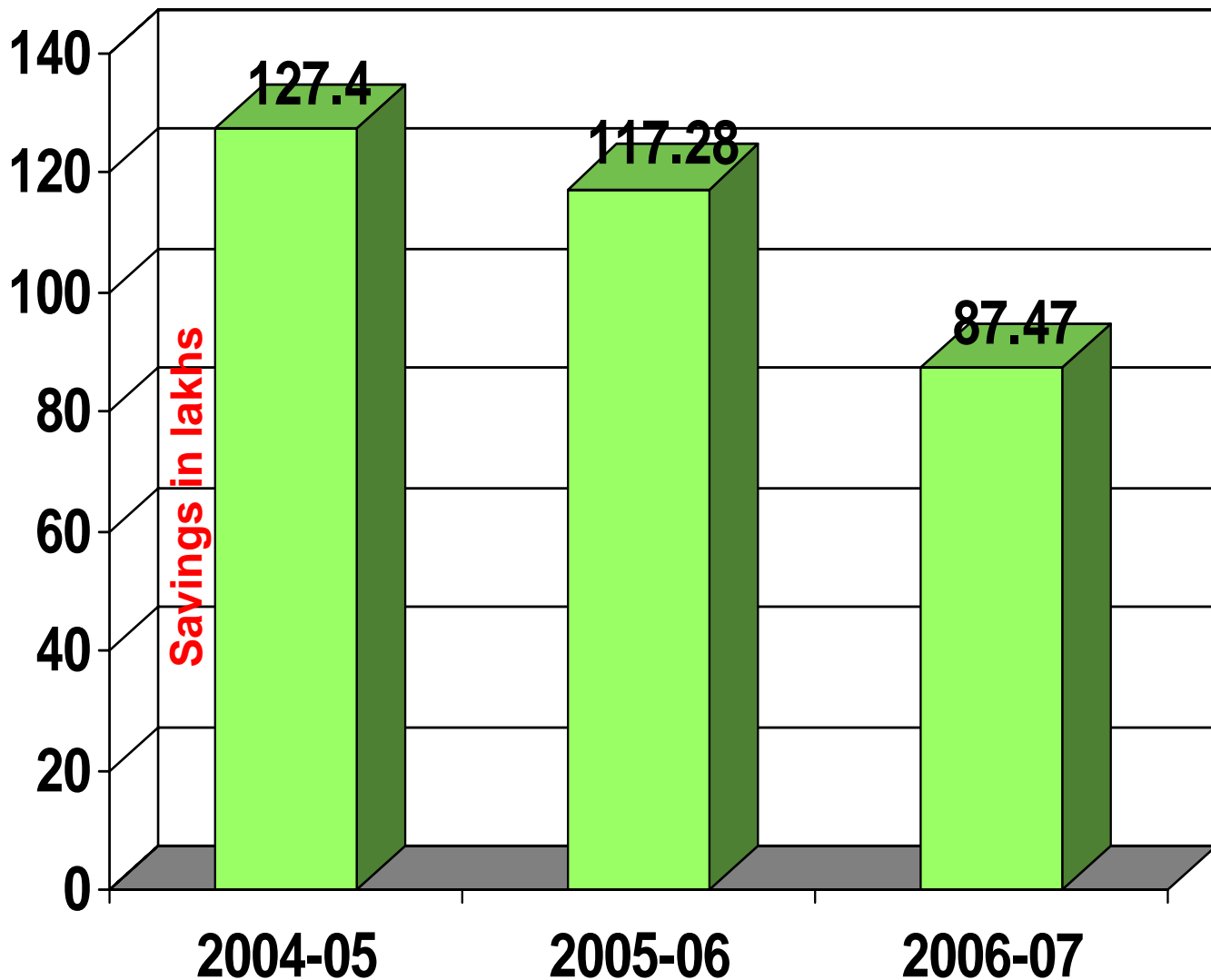
YEAR	SEC	E.B. Charges in Lakhs (Rs.)
2004-05	1245	127.4
2005-06	1221	117.28
2006-07	862	87.47

ANNUAL ENERGY CONSUMPTION OF SANCHAR BHAWAN BUILDING



Saving in energy consumption during 2006-07 is 7.34 lakh units

ANNUL ELECTRICITY BILL CHARGES OF SANCHAR BHAWAN BUILDING



SAVING ACHIVED DURING 2006-07 is Rs. 29.81 lakhs

Organizational setup for energy conservation

Core Group for monitoring of Energy conservation measures

M (F)	Chairman
M(T)	Member
Add.Sec(T)	Member
DDG(Elect.)	Member - Convener

Implementation of Energy conservation measures --- in-charge

DDG(Elect.)

SDE(Elect.)-I

SDE(Elect.)-II

JTO(Elect.)

**Retrofitting
measures
carried out
in-house
during
2006-07**

No Cost measures

- **Contract maximum demand rationalized**
- **Scaling down the excess level of illumination**
- **Switching OFF the lights in unmanned areas**
- **Re-orientation of fittings has been done in order to reduce the number of fittings**
- **Switching off one transformer after office hours/ holidays and low load hours**
- **Power factor of 0.98 is being maintained**
- **Equalization of Load in all three phases is being done**

No Cost measures

- **The servicing and preventive maintenance of the window/ split AC units have been taken up in order to get optimum efficiency**
- **Cooling Load adjustment for AC space has been done by thermostats**
- **Cooling Load has been minimized by providing partitions and closing supply air/ return air grills and diffusers of unutilized space**
- **The filters of the window Air Conditioners and package units are being cleaned periodically every fortnight**
- **Awareness for energy conservation among the employees created**

Other measures

- **Occupancy Sensors have been provided in the officers room**
- **Lux sensors have been used for outdoor lighting**
- **CFL fittings have been provided in the corridors, lift lobby and bathroom**
- **Timer has been provided in Yard lighting to facilitate auto ON & OFF operation**
- **Energy efficient 28 Watts CFL Compound light fitting have been installed in replacement of 70 watts HPSV fitting**
- **Timers provided for exhaust fans in toilets/ staircases**

Contd.....

- **Electronic ballast mirror optic fittings of high efficiency halo phosphate 36 W Fluorescent lamps (3250 Lumens) have been installed in replacement of Box type fittings with copper ballasts (30% savings achieved)**

Electronics Ballast parameters

Power Factor not less than 0.98

Harmonic Distortion less than 10%

Over Voltage protection $290V_{\pm 10V}$

Ambient temperature 55°C

Ballast comply to IEC 928/ 929, EN 55015 & IEC 1000-3-2

Contd...

- **Remote controls have been provided in Window AC units in officers room**
- **3x33 TR roof top chiller have been installed in replacement of 1st floor 2x64 TR central AC plant**
- **Energy efficient pump sets have been installed in replacement of the energy inefficient & low efficiency water pump sets**
- **Energy efficient vacuum circuit breakers have been installed in replacement of Oil circuit breakers**
- **1500 LPD capacity solar water heater for 2nd, 8th & 11th floor canteen has been installed in replacement of Electric Geysers/ boilers**



New mirror optics fitting with electronics ballast

Box type fittings with copper ballasts have been replaced with electronic ballast mirror optic fittings having high laminar efficiency halo phosphate 36 W Fluorescent lamps

Savings per annum = 1.99 Lakh kWh

Cost savings per annum = Rs.8.76 Lakhs

Project cost = Rs. 18.54 Lakhs



Old mirror optics fitting with copper ballast

The energy inefficient low efficiency water pump sets have been replaced by energy efficient pump sets



New Energy efficient pump sets



Old Energy inefficient pump sets

Savings per annum = 0.57 Lakh kWh

Cost savings per annum = Rs.2.51 Lakhs

Project cost = Rs. 2.5 Lakhs

Occupancy Sensors have been provided in the officers room for controlling light and window/ split air conditioner circuits



Savings per annum = 1.16 Lakh kWh

Cost savings per annum = Rs. 5.10 Lakhs

Project cost = Rs. 8.75 Lakhs

Microprocessor controlled Roof top chiller have been installed in replacement of 1st floor life expired 2x64 TR Central AC Plant



New Roof top Chiller



Old 2x64 TR Central AC Plant

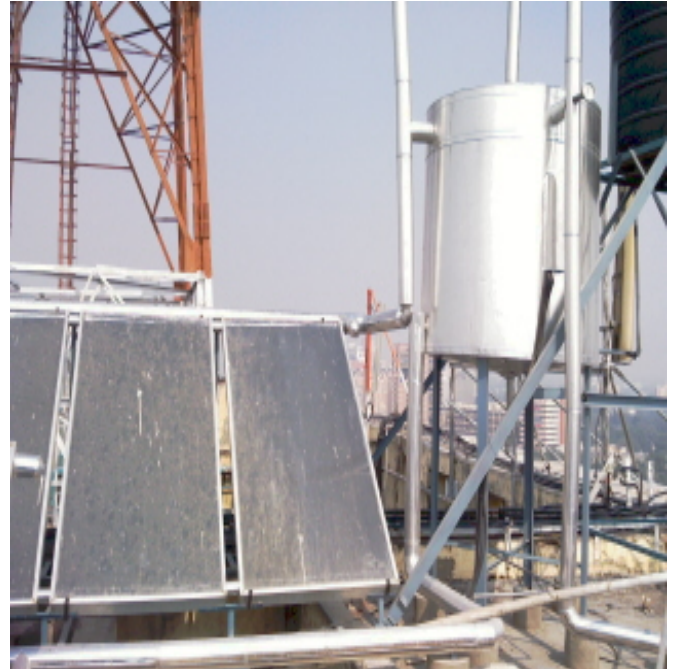
By adjusting the thermostat setting and minimizing cooling load in 1st, 2nd, 12th & 13th floor, an additional saving of Rs. 7.92 Lakhs has been achieved.

RENEWABLE ENERGY

Providing Solar Water Heater



Electric Geyser



Solar Water Heater

1500 LPD capacity solar water heater has been installed in replacement of electric geysers/ boilers

Savings per annum = 0.52 Lakh kWh

Cost savings per annum = Rs. 2.29 Lakhs

Project cost = Rs. 5.75 Lakhs



New Vacuum circuit breakers

Energy efficient vacuum circuit breakers have been installed in replacement of Oil circuit breakers



Old Oil Circuit breakers



New 28 Watts CFL Compound light fitting

Energy efficient 28 Watts CFL Compound light fitting have been installed in replacement of 70 watts HPSV fitting



Old 70 Watts HPSV Compound Light Fitting



Timers provided to switch off half of the compound light at midnight to save energy

GENERAL

- **Core group monitors the progress on implementation of Energy conservation measures**

- **Tips for saving electricity distributed to all employees for bringing awareness**
 - a. Setting computers, monitors and copiers to use sleep-mode when not in use, helps cut energy cost by approx. 40%.
 - b. For switching off TV and AC do not use “remote”. Switch them off from mains to save electricity.
 - c. Use of CFL can save upto 50% of lighting energy bill.
 - d. Switch off electrical appliances when not in use.
 - e. Allow enough space for air circulation around the refrigerator.
 - f. Operate refrigerator at normal settings. Adjust the thermostat to set inside temperature according to room temperature.

- g. Cool hot food items to room temperature before placing them in the refrigerator.
 - h. Keep tubes, bulbs clean. Dust decreases lighting level by 20-30%.
 - i. Use 36 Watt slim tube-light with electronic chocks.
 - j. Set the temperature of Air Conditioner at 25°C for most comfort at least cost. 5% more energy will be used for each degree decreasing in temperature setting.
 - k. Use split AC instead of window AC. It costs more at the time of purchase but is more energy efficient and consume less electricity.
 - l. Use reflective tiles or insulation on the roof-top to keep the interiors cool.
 - m. Use Solar Water Heater instead of storage electric geysers. It has zero maintenance and saves upto 1500 units of electricity in a year.
 - n. Use electric devices with occupancy sensors which switch on and off automatically by sensing occupancy of the rooms.
 - o. Install double glass panel in windows.
- *IF THE POWER SAVING TIPS ARE FOLLOWED A SAVING OF 30-50% IN ELECTRICITY CAN EASILY HALF YOUR ENERGY BILL.*

New Technology in Department of Telecom

**(High Sensible Heat AC Package unit with
following energy efficient features)**

- **Dehumidification is achieved by reducing 1/3 of the effective coil areas of the cooling coil through solenoid valve arrangement**
- **50% of the waste heat rejected to condenser in one of the circuit of the AC unit is utilized**
- **Variable speed/ two speed condenser fan motor**
- **Energy efficient motor as per IS 12165**
- **High sensible heat units consumes 30% less energy. Heaters and humidifiers have been eliminated.**
- **The higher sensible heat AC unit with 0.95 SHF should be used for industrial applications. If AC units designed at 0.65 to 0.7 SHF available in the market are used in the industries, there is approximately 30% energy wastage**

Other New Technology

- **Panel Coolers**

The space enclosed by the panel cooler is utilized for housing small equipment racks or BTS/OFC (UHF)/IMPCS systems. The basic purpose is to segregate the equipments for the purpose of air-conditioning instead of air-conditioning the entire room

- **Geo Thermic**

The relative constant temperature in the depth of approx. 3-4 meter under the earth surface provides the simple and cost effective solution for cooling and heating. The thermal energy (Geo Thermal heat) stored underneath the earth is available all the time and the flow is not affected by seasonal variation and outside temperature

**SUGGESTIONS
FOR PROMOTING
ENERGY
EFFICIENCY &
CONSERVATION
IN INDIA**

To make available only quality product in market

- SEC standards for the lighting fixtures, AC equipments and household appliances and freeze their component specifications introducing energy conservation concepts
- Make IS marking & Energy star rating mandatory for all products & all manufacturers have to manufacture products conforming to energy consumption standards and specifications
- To prohibit manufacture & sale of electrical products not conforming to standards and ban on low quality energy inefficient product from other countries to the market by enforcing suitable legislation
- Tax incentives for clean energy systems and high energy efficiency fixtures
- Research funding to help make alternative energy technologies practical and affordable

To make it mandatory in Govt./ public sector

- Replacement of all incandescent lamps with appropriate rating integral ballast CFL
- Replacement of all conventional linear fluorescent fittings with electronics ballast and tri phosphor lamp fitting
- Use of energy efficient high star rated product

To enforce in public lighting

- Use of energy efficient sodium lamp luminaries
- Street light dimming when traffic density is decreased to save about 40% energy
- To enlarge use of LED in traffic lighting, outdoor display, signage, shop lighting and remote villages

To develop technology for energy conservation

- Sensible heat air conditioners designed at 0.95 SHF are to be used for industrial application so that 30% energy now being wasted using AC units designed at 0.65 SHF could be saved
- The Geothermal environmental concept provides the simple and cost effective solution for cooling and heating. This can be utilized for cold storages and warehouses, which require constant temperature throughout the year
- *Panel coolers* Cooling unit attached with the equipment like in refrigerator

To reduce wide variations in energy consumption among different units within the same industry

- Prescribe energy consumption norms based on models adopted in other countries
- Adopt automatic process control system for best efficiency
- Industries to share information on energy conservation best practices

To achieve reduction in transmission/ feeder losses

- Set up benchmarks for feeders losses and introduce 100% metering for feeders at both the ends. Consider aggregate technical and commercial loss
- Introduce energy accounting system to monitor energy flowing into a particular sub-system vis-à-vis energy sold/ utilized in that sub-system
- Introduce layout having uniform feeder size and uniform grid spacing

State Govts. to undertake measures

- State Govts. to enforce energy conservation practice & standards
- Amend the energy conservation building codes to suit the regional and local climatic conditions
- Govt. to prescribe energy consumption norms and standard for different designate consumers
- Digital energy meters should have display of a price related parameter for units consumed in rupees. It will have more impact on the consumers as they will come to know the electricity bill charges to be paid during the month and accordingly be more conscious of use of energy

To create awareness

- Include topics on energy consumption/ energy efficiency and related concepts in the school curriculum/ syllabus so that the future generations shall be more caring and concerned for energy conservation
- Bridge the gap existing in perception and mindset of the people on the new emerging concepts of energy efficient products introduced in the country by conducting regular training courses/ seminars/ display/ advertisements