

energy consumption.

BRIEF

With growing population in urban settlements, the increasing demand for energy has become a major challenge. Lack of awareness and inefficiency of the current energy system has led to irresponsible energy consumption. With current government trying to provide electrification across India, it is imperative to ensure maximum efficiency and minimum wastage of energy resources.

SUSTAINABLE DEVELOPMENT GOALS



SCIENCE & LIBERAL ARTS - III (ELECTIVE) design for urban transformation

26th to 30th Aug. '19

SAUBHAGYA YOJNA

Pradhan Mantri Sahaj Bijli Har Ghar Yojana

- Launched in September 2017.
- Free electricity connections: (both APL and poor families) in rural areas. poor families in urban areas.
- Rural Electrification Corporation (REC) has been designated as nodal agency for the Saubhagya scheme.

IMPACT

- 100% electrification target has been met in all states barring Chhattisgarh — where power penetration currently stands at 99.67% by December 31, 2018
- Provided 143 crore LED bulbs with the participation of the private sector, resulted in a savings of approximately Rs 50,000 crore per year in electricity bills for poor and middle class families

UJALA SCHEME

Unnat Jyoti By affordable LEDs for all (Ujala)

- Launched in January 2015, currently the largest LED distribution programme in the world.
- Providing LED bulbs at about 40% of the market price under the UJALA Scheme
- The Electricity Distribution Company and Energy Efficiency Services Limited (EESL) a public sector body of Government of India are implementing the programme

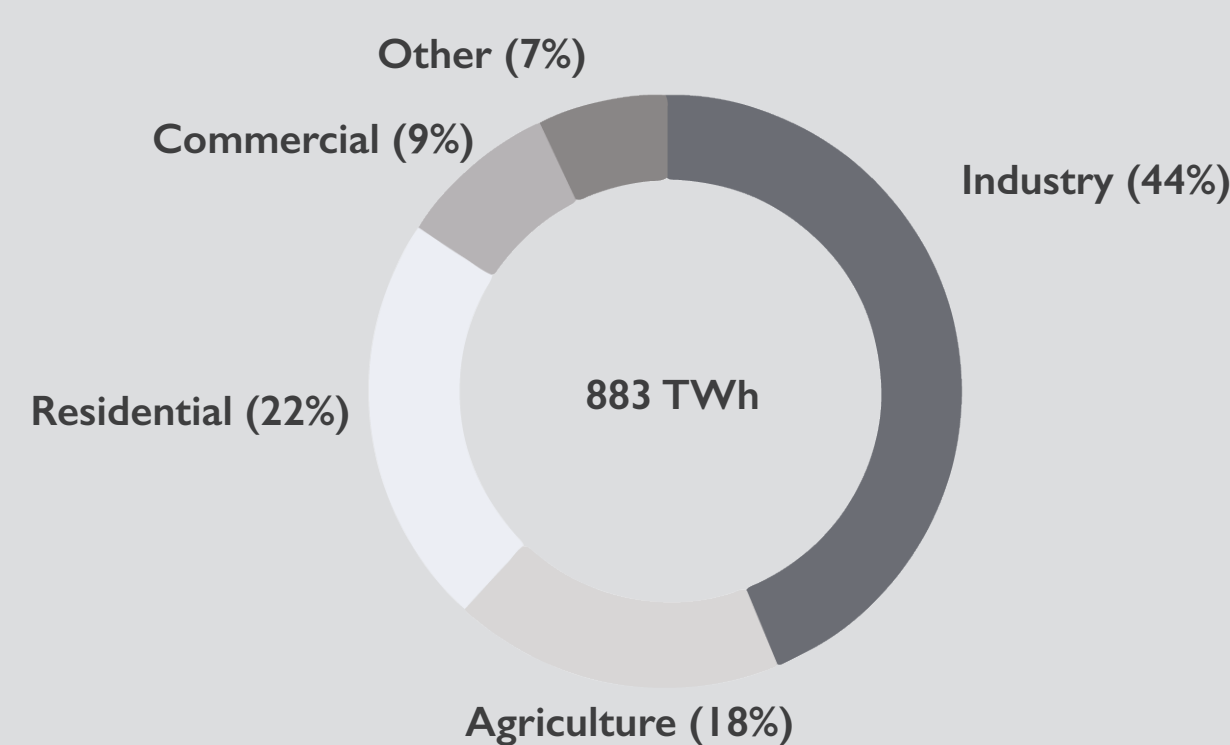
IMPACT

- The distribution of 30 crore LED bulbs in India has led to energy savings of over 38,952 million kWh, annually, amounting to Rs 15,581 crore in energy savings, an EESL statement said.
- Annual LED domestic production increased from 30 lakh bulbs to over 6 crore bulbs, simultaneously creating 60,000 jobs, the statement added.

OBJECTIVE

"To understand the energy consumption pattern of educational institute and provide framework to minimize energy waste and consumption and to optimize the utilization of sustainable energy"

SECTOR WISE ELECTRICITY CONSUMPTION



ISSUES IDENTIFIED

- Huge amount of **cost incurred** due to inefficient Energy Consumption.
- Lack of awareness and responsibility** by involved stakeholders (Students, Faculty and Staff).
- Lack of Feedback** about their consumption patterns and its effect.
- Lack of Optimization** of available resources.

smart switch panel

1 solutions

FEATURES

ENERGY CONSUMPTION METER

Indicators showing
Daily Consumption - 70% energy threshold
Monthly consumption - kWh
Real time Cost incurred
Notification by illuminating borders of the panel when daily consumption exceeds threshold.

IOT/ Automated Solutions - Seasonal/ Weather based smart optimized lighting

A sensor on the panel can detect natural light and have features for automatic adjustment of usage of electrical equipments based on the weather

IMPACT & WORKING

The indicators will make the consumers aware of excessive use of electricity as the Smart Switch Panel will be connected to all the electronic devices. The light notifications will flash on the device whenever the threshold of usage is crossed. These indicators will trigger the consumers to switch off all the appliances when not in use, thus optimising energy consumption. The real time cost calculation display will make the consumers more responsible as they will become aware that unnecessary usage will cost them money. Notification border will encourage the consumers to maintain ideal economy consumption. The natural light can be detected and indoor lights will adjust themselves accordingly.

ESTIMATED SAVINGS

Total units (per month) : 87,280

Current cost incurred (per year) : Rs. 94,28,520

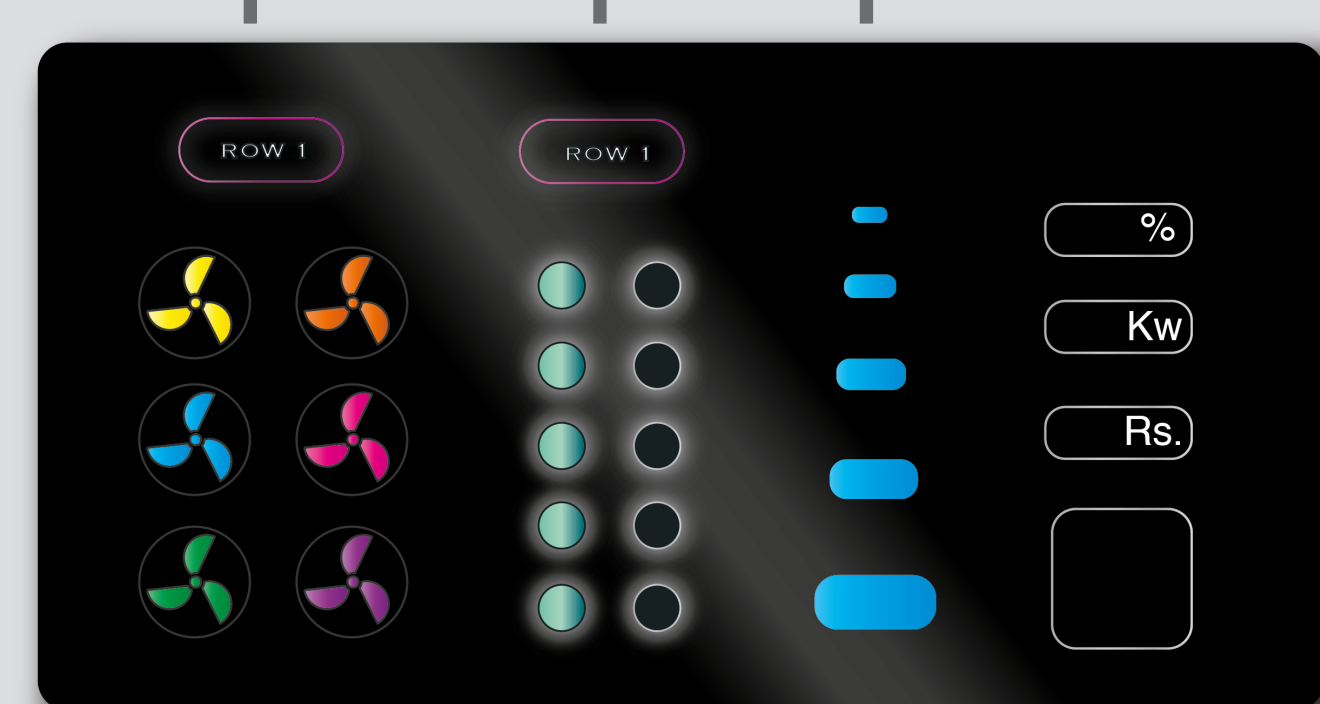
USING LEDS CAN CUT DOWN ON 40% OF TOTAL UNITS.
OUR SOLUTION CAN CUT ON 40% OF ENERGY USED.

40%
ENERGY SAVED

COLOUR CODED FAN SWITCHES

LIGHT SWITCHES ACC. TO ROWS

COLOUR INDICATION OF USAGE



PERCENTAGE OF DAILY USAGE
UNITS OF MONTHLY USAGE
LIVE COST INCURRED
LIGHT DETECTION SENSOR

2 smart ceiling lighting

FEATURES

Optimized Lighting.

IOT connected Smart Lighting.

Proximity Sensor / Heat Sensor

INTENT

To optimise energy consumption by providing lighting with uniform false ceiling where the intensity of lights can be customised by using sensors to illuminate required specific area.

IMPACT & WORKING

- The uniform ceiling can provide uniform lighting within a space.
- The sensor can moderate the space lighting by dimming other areas and illuminating the required spaces real time.
- Optimized Power consumption can be attained by minimizing wastage.

3



FEATURES

Decentralised remote location control system
To integrate overall electrical appliance energy consumptions statistics across institute under one platform for easy management of energy.

INTENT

To monitor overall consumption patterns in different spaces across the institute.

WORKING & IMPACT

Minimized wastage by creating awareness about daily, monthly and seasonal consumption patterns.
To make all the stakeholders more responsible towards their energy usage. Dimming your lights an average of 50 percent can cut your electric use a whopping 40 percent over time and make your bulbs last 20 times longer.

SUBMITTED BY :

Avantika Lal | Jayati Misra | Nachiket Akhave | Saksham Panda
Shubhangi Pandey | Supriya Patil | Umesh G.

FACULTY :

Dr. Mihir Bholey



राष्ट्रीय डिज़ाइन संस्थान
NATIONAL INSTITUTE OF DESIGN