

ENERGY AUDIT REPORT
FOR
Adivasi Seva Samittee
Arts, Commerce and Science College,
Tal—Kalwan, Dist.—Nashik.



DATE OF AUDIT—24/02/2022.
AUDIT CARRIED OUT BY-
MM CONSULTANCY SERVICES, NASHIK.

INTRODUCTION.

COLLEGE PROFILE

Adivasi Seva Samiti Sanchalit Arts Commerce And Science College Manur is a private un-aided affiliated college in Manur Kalwan, Nashik in the state Maharashtra. Adivasi Seva Samiti Sanchalit Arts Commerce And Science College Manur was established in the year 2013 and got affiliated to Savitribai Phule Pune University in year 2013. The college is co-educational by its nature. The college has a sum of 5 acres of land and the college premises is built within 5000 square meters.

Highlights-

College Website	www.ass.org.com
Established	2013
Affiliated From Affiliation Year	Savitribai Phule Pune University 2013
College Type	Affiliated College
College Management	Private Un-aided
University Type	State Public University
University Website	www.unipune.ac.in
College Address Pincode	At Post : Manur, Tal: Kalwan Dist: Nashik Nashik, Maharashtra 423501
Location	Manur Kalwan, Nashik, Maharashtra
College Type	Affiliated College



ACKNOWLEDGEMENT.

Energy Conservation & Energy Management has become a predominant factor now a days in Education Sector for a successful management of schools & colleges. Needless to say, Energy Cost optimization is the only opportunity in these institutions to control overall management costs as Manpower & other costs are going up steadily & are difficult to control.

We are grateful to Dr. Rajendra Popatrao Bhamre, Principal, ACS College Manur, Kalwan for giving an opportunity to MM Consultancy Services to identify potential for energy savings in the college with a objective to conserve energy on sustainable basis & by adapting simple but proven measures to serve a Noble Cause for our Nation.

We also take this opportunity to thank ACS College staff members who supported & contributed in providing us a comprehensive Data during our energy audit without which our audit could not have been transparent & successful.

Finally, we urge management to implement the proposals identified in our audit & presented in this report to optimize present energy consumption & costs & set example not only for their students & Staff but also for nearby colleges to go ahead for this commendable work for energy conservation.

As is evident, energy conservation not only saves money but also plays an important role in improving environment by reduction in deadly gases which affect our environment significantly.

Thank you Once Again—

MM Consultancy Services, Nashik.

Energy Scenario.

Major Energy used in ACS College Campus is Electricity which is purchased from MSEB as LT power.

Major electricity consuming equipment are-

Lighting.

Fans

Water Lifting Pumps

Computers

CCTVs

Printers

Average Rate of purchase of electricity from MSEB is @ Rs. 16.4 per Unit of consumption as presented in Table-1 below-

TABLE-1.

Area	Month	Units	Bill-Rs	Unit Rate	
ACS College	Jan-22	166	2540	15.3	
Ashram School	Jan-22	209	3610	17.3	
Total		375	6150	16.4	

Energy Saving Opportunities—

Lighting—

Present energy inefficient lighting in the campus to be replaced with energy efficient lighting -LED.

The impact of above measure is presented in Table-2 below-

TABLE-2	LED Lighting					
Present Lighting Type	Watts	Numbers	Total Watts	Savings with LED-50 %	Savings per year	Savings per Year- Rs.
Tube Lights	20	38	760	380	608000	9971.2
Flood Lights	30	4	120	60	96000	1574.4
Total Savings per year			880		704000	11545.6
Approx.InvestmentRs.						15000
Simple Pay back years						1.30

It is therefore recommended to replace existing lighting with LED Lighting.



The light-emitting diode (LED) is today's most energy-efficient and rapidly-developing lighting technology. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting.

Energy Savings

LED is a highly energy-efficient lighting technology, and has the potential to fundamentally change the future of lighting in the United States. Residential LEDs -- especially ENERGY STAR rated products -- use at least 75% less energy, and last up to 25 times longer, than incandescent lighting.

How LEDs are Different

LED lighting is very different from other lighting types such as incandescent and CFL. Key differences include:

Light Source: LEDs are the size of a fleck of pepper, and can emit light in a range of colors. A mix of red, green, and blue LEDs is sometimes used to make white light.

Direction: LEDs emit light in a specific direction, reducing the need for reflectors and diffusers that can trap light. This feature makes LEDs more efficient for many uses such as recessed downlights and task lighting. With other types of lighting, the light must be reflected to the desired direction and more than half of the light may never leave the fixture.

Heat: LEDs emit very little heat. In comparison, incandescent bulbs release 90% of their energy as heat and CFLs release about 80% of their energy as heat.

Lifetime: LED lighting products typically last much longer than other lighting types. A good quality LED bulb can last 3 to 5 times longer than a CFL and 30 times longer than an incandescent bulb.

LED Products

LED lighting is available in a wide variety of home and industrial products, and the list is growing every year. The rapid development of LED technology has resulted in increased product availability, improved manufacturing efficiency, and lower prices. Below are some of the most common types of LED products.

Industrial and Commercial Lighting

The high efficiency and directional nature of LEDs makes them ideal for many industrial uses. LEDs are increasingly common in street lights, parking garage

lighting, walkway and other outdoor area lighting, refrigerated case lighting, modular lighting, and task lighting.

Under-Cabinet Lighting

Because LEDs are small and directional, they are ideal for lighting tight spaces such as countertops for cooking and reading recipes. Since there can be variation in light color and directionality, it is important to compare products to find the best fixture for your space.

Recessed Downlights

Recessed downlights are commonly used in residential kitchens, hallways, and bathrooms, and in a number of office and commercial settings. DOE estimates there are more than 600 million recessed downlights installed in U.S. homes and businesses.

LED Replacement Bulbs

With performance improvements and dropping prices, LED lamps can affordably and effectively replace 40, 60, 75, and even 100 Watt incandescent bulbs. It's important to read the Lighting Facts Label to make sure the product is the right brightness and color for its intended use and location.

LED Holiday Lights

LEDs consume far less electricity than incandescent bulbs, and decorative LED light strings such as Christmas tree lights are no different. Not only do LED holiday lights consume less electricity, they also have the following advantages:

Safer: LEDs are much cooler than incandescent lights, reducing the risk of combustion or burnt fingers.

Sturdier: LEDs are made with epoxy lenses, not glass, and are much more resistant to breakage.

Longer lasting: The same LED string could still be in use 40 holiday seasons from now.

Easier to install: Up to 25 strings of LEDs can be connected end-to-end without overloading a wall socket.

Energy Efficient Fans—

Existing ceiling fans in use at ACS College campus are old & energy inefficient. We recommend to replace these fans with energy efficient BLDC Motor technology Fans . Impact on energy savings with this measure is tabulated in Table-3 below.

TABLE-3	Energy Efficient Fans					
Existing Fans	Watts	Number	Total W	Savings with	Savings	Savings per
				BLDC Fans	per year	Year-Rs.
				60%	Kwh	
Conventional	100	40	4000	2400	1920	31488
Approx. Investment Rs.						105000
Simple pay-back years						3.33

It is therefore recommended to replace existing fans with BLDC energy efficient fans.



Energy Efficient Fans.

Ceiling fans are not just a fixture but a major home appliance in India. It is used around the clock for the majority of the year. This causes a huge amount of energy consumption by ceiling fans at the residential level itself. Due to rising environmental concerns and issues evoked in creation of energy, there is a need for conservation of energy and available resources for power generation.

BLDC Infographic explains What is BLDC Motor technology and its top benefits

Crompton has introduced the Active BLDC technology in their ceiling fans. This advanced technology has been a boon to consumers as it not only helps reduce energy consumption but also reduced your electricity bill. BLDC motor stands for Brushless Direct Current Motor and as the name suggests, it works on direct current electricity. BLDC motor uses permanent magnets, instead of electromagnets that are used in conventional motors. The permanent magnets of BLDC motor have less energy and heat losses compared to electromagnets. This motor converts the input of alternate current into direct current, and hence this technology works smoothly even at low voltage or power fluctuations. The technology of Active BLDC motor adds an advance mechanical feature to your regular ceiling fan and changes it to a modern appliance to merge with the smart homes of today. Alongside, it brings you a great deal as it reduces your energy consumption by up to 50%.

BLDC Fans vs Normal Fans

As compared to a conventional ceiling fan, a ceiling fan with Active BLDC technology can generate the same amount of airflow with less energy usage and better power factor. Hence ceiling fans with Active BLDC motors are energy-efficient and give better energy outputs.

Energy Efficient Fans run on Active BLDC motors. BLDC motor fans consume approximately half the power of a traditional motor fans use Active BLDC technology which operates on wide voltage range from 90V-300V. It is observed that a conventional fan's electricity bill comes up to ₹ 2850 annually per fan whereas fans with Active BLDC technology have an electric bill of just of ₹1350, thus saving ₹1500. Also, for 4 fans in a home the saving is ₹6000. This great saving is only possible due to Active BLDC technology.

Tips For Energy Savings in Computers-

Unplug your computer when not in use

When you're not using your computer, it's best to shut it down and unplug it. This is because a plugged-in PC — even when switched off — still consumes standby power.

2. Disconnect external devices

When they're connected to your PC, devices such as printers, headphones, and webcams consume power even when they're not in use. This is why you should disconnect or remove external devices from your PC once you're done using them.

3. Alternatively, use a smart strip, especially for computers you cannot turn off

A smart strip is a series of several electrical outlets in one strip, with circuits to monitor and maximize your gadgets' power consumption. It can electronically unplug any device so that they stop drawing current, which saves energy. By connecting your PC and peripherals (e.g., printers, scanners) to the smart strip, you won't need to unplug your equipment when you're not using them.

4. Adjust your computer's energy settings

Adjusting your PC's power settings will help you consume less energy. For example, you can opt to put your hard drive and monitor into sleep mode when they're left idle for a few minutes. Lowering the brightness of your screen also saves electricity.

5. Use a charger only when your laptop is charging

When we charge our laptops, we tend to forget about them, leaving them plugged in for hours. Unfortunately, overcharging degrades the battery over time. Leaving the charger plugged in — even if it's not connected to your computer — also consumes standby power.

To save energy, make sure to unplug your laptop charger once you're done charging. Alternatively, you can use a wall outlet with a timer or plug your charger into a smart strip.

6. Choose an Energy Star-compliant PC

Energy Star is the US Environmental Protection Agency's symbol for energy efficiency. Every product that earns the Energy Star symbol is guaranteed to

deliver both quality performance and energy savings. The more stars a product has, the more energy-efficient it is. Studies show that a single Energy Star-compliant computer and monitor can save between \$7 and \$52 per year in electricity bills.

These tips should help you lower your electricity costs and make smart hardware choices. If you need assistance in choosing the best hardware for your specific needs, give us a call. We'll be glad to help.

Energy Savings in water pumping

Existing water system in the ACS College Campus incorporates pumping of borewell water to overhead tank from where it is fed by gravity to all potential users in the campus.

Pump is stopped when overhead tank is full & overflow from the tank is observed by security watchman manually. Similarly pump is started manually when overhead tank level drops down to minimum.

This manual system of operation is highly inefficient as it depends on human control which can not be regular & precise.

It is therefore strongly recommended to install an automatic level controller on overhead water tank which is to be set at predetermined high & low levels in the Overhead water tank.

This system will automatically switch off the pump when predetermined high level in the overhead tank is reached. It will also automatically restart the pump when a predetermined low water level is reached.

This system eliminates all possible human errors & is highly accurate & dependable not only saving water in overflow but also pump power wasted during overflow if unnoticed.

How to save energy on campus?

With the academic year now in full swing, students, faculty, and staff are back on campus in dorm and office settings. As an employee at the University, it may be easy to overlook your energy consumption since you don't have to pay a utility bill and no one holds you accountable for how much energy and water you use. Here are some tips on how to be sustainable in an office setting.

Being sustainable in the office:

Turn off and unplug all appliances while not in use

Turn off lights when you leave a room

Use reusable dishware in the office

Walk, bike, carpool, or use public transportation as often as possible rather than driving

Recycle and encourage others to recycle in your office

Use double-sided printing

Make a pot of coffee and share with your co-workers rather than using a coffee machine that only brews a single cup of coffee

Keep your electronics on a low brightness setting to save energy



Conclusion.

Energy Audit of ACS College campus was carried out on the basis of tech. inputs recd. From college campus & applications which are well established in the market today.

Audit was fully transparent & practical in all aspects of engineering parameters & established facts noted during the audit.

We would request ACS College management to implement all our proposals presented in this report to achieve energy savings in reality. Scrap value of existing lighting & Fans is not considered in this report which would further reduce the financial pay back of our proposals.

We hope this audit will be taken seriously by college management & implementation of our proposals shall be undertaken at earliest possible.

Last but not the least we thank you once again for giving us an opportunity to carry out this audit with a good support received from Principal Dr. Bhamre & his Team to make this audit successful.

MM Consultancy Team.

