ENERGY REPORT

CHITKARA UNIVERSITY, PUNJAB

2024-2025

OVERVIEW- ENERGY SAVING MEASURES AT CHITKARA UNIVERSITY

I. **SOLAR PANELS:** Installed Solar Panels with capacity of 1200 kWp Energy Saving = 79.01%

II. **LED LIGHTS:** Replaced incandescent lights with more Energy Efficient LED light's Energy saving = 50%

III. **BLDC CEILING FANS:** Replaced commercial ceiling fan with the Brushless DC Ceiling Fans = 36%

IV. **VRF AIR CONDITIONING:** Replaced the ductable air conditioners with variable refrigerant flow
Energy Saving = 28%

V. **BLDC EXHAUST FANS:** Replaced the commercial exhaust fans with the brushless DC exhaust fans
Energy Saving = 72%

VI. **HEAT PUMPS:** Replaced water heater tanks with the heat pump Energy Saving= 81%

ENERGY MANAGEMENT

ELECTRICAL SYSTEM

Presently Chitkara University, Rajpura, Punjab plant has 11 KV Supply from Punjab State Power Corporation Ltd after that it is stepped down to 11 KV/0.440 kV. The Campus having Two electrical connections, Sub Station-1 with 3990 KVA Contract Demand and Sub Station-2 With 1700.606 KVA Contract Demand. Three transformers of 1250 KVA, 2000 KVA, 2500 KVA for Sub Station-1 and 1250 KVA Sub Station-2 is installed.

ENERGY SAVING PROJECTS IMPLEMTED BY THE UNIVERSITY

The University has initiated several projects aimed at energy conservation. Here are some the key projects successfully implemented by the institutions management.

- ## ENERGY SAVING GPROJECT # 1: ROOFTOP SOLAR SYSTEM OF 1200 KWP

The University executed a project to install a rooftop solar system. Solar Panels, Integral components of renewable energy setups, transform sunlight into electricity using photovoltaic cells, these cells, crafted form semiconductor materials, produce eco-friendly power devoid of emissions. Embraced across residential, commercial, and industrial sectors, solar panels play a crucial role in fostering sustainable energy practices, lessening dependence on non-renewable sources, and alleviating environmental repercussions.

Picture of Solar Power Plant Panels at Chitkara University

Picture of Solar Power Plant Panels at Chitkara University

ADDITIONAL SOLAR POWER PLANT CAPACITY

Sr.No	Description	Location	Capacity	Qty
1	Solar Power Plant	Aristotle Hostel	50 kWp	1
2	Solar Power Plant	Franklin Hostel	100 kWp	1
3	Solar Power Plant	Tesla Block	150 kWp	1
Total Capacity			**300 kWp**	

- **ENERGY SAVING PROJECT # 2:**
  HEAT PUMP

The University successfully executed a project involving the installation of almost 26 Heat Pump with various capacities. 81.25% energy is being saved using heat pump instead of water heater tanks. These versatile technologies excel in transferring heat efficiently between locations, catering to both heating and cooling needs. Functioning on the principle of extracting warmth from the air, ground, or water, Heat Pumps deliver energy-efficient climate control for both residential and commercial settings. By reversing their operation, these pump effectively cool indoor spaces during warmer seasons, showcasing an eco- friendly approach with reduced energy consumption compared to traditional heating or cooling systems. Widely recognized for their Sustainability and cost-effectiveness, Heat Pump actively Contribute to minimizing carbon footprints and endorsing environmentally conscious temperature regulation solutions.

Picture of Heat Pump Installed at Chitkara University

I. Energy Efficiency:

Heat Pumps are more energy-efficient for water heating compared to traditional electrical resistance heaters. They move heat rather than generation it, making them more efficient in converting energy into heat.

II. Cost Savings:

Heat Pump can result in cost savings over time due to their higher energy efficiency. While the initial investment may be higher, the lower operating costs can lead to significant savings in the long run.

III. Environmental Impact:

Heat pump produces fewer greenhouse gas emissions compared to electrical resistance heaters. They utilize ambient air or ground temperature to heat water. Reducing the overall environmental impact

IV. Renewable Energy Compatibility:

Heat pumps can be easily integrated with renewable energy sources, such as solar or wind power, further reducing their carbon footprint and dependence on non –renewable energy

V. Consistent Performance in Cold Weather:

Unlike some Traditional Electric heaters that my struggle in cold climates, heat pumps can maintain relatively high efficiency even in colder temperatures, making them suitable for various climates

VI. Longer Lifespan:

Heat pumps generally have a longer lifespan compared to traditional electric water heaters. Properly maintained heat pump systems can last for 15 Years or more

VII. Quick Payback Period:

While the initial cost of a heat pump may be higher, the energy savings CAN LEAD to a quicker payback period compared to traditional electrical heaters, especially in regions with high electricity costs.

VIII. Reduced Peak Demand:

Heat Pump can help reduce peak electricity demand since they operate more efficiently than electrical resistance heaters. This can be beneficial for overall gird stability.

HEAT PUMP INSTALLATION INSIDE THE CAMPUS

JULY 2024 – JUNE 2025

Sr.no	Location	Capacity	Qty
1	Franklin Hostel	18 KW	6
2	Alfred Noble Hostel	18 KW	5
3	Square One	10 KW	1
4	IBN Hostel	18 KW	3
5	Magellan Hostel	18 KW	1
6	Vasco Da Gama Hostel	18 KW	2
Total Heat Pump			18

- **ENERGY SAVING PROJECT 3:**
  ENERGY EFFICIENT LED LIGHTS

The University initiated a project to install energy efficient lights in various areas such as classrooms, the sports room, and streetlights. These advanced LED Lights mark a significant shift in lighting technology, saving 50% of energy as compared to commercial lights in 2024-2025 with a prolonged lifespan, they minimize both waste and maintenance expenses, while providing instant illumination and emitting low heat for enhanced safety. The adoption of LED lights aligns with environmental sustainability goals, making them a conscientious choice for contemporary lighting solutions that contribute to eco – friendly practices.

Power Efficient Equipments (July 2024- June 2025)

All the lighting fixtures in the University are energy efficient lighting fixtures.

Energy Efficiency Appliances

The Total energy efficiency appliances used the university in the given time period is 243 appliances.

Picture of the Energy Efficient Lighting Fixture

- **ENERGY SAVING PROJECT #4:**
  ENERGY EFFICEINET BLDC EXHASUT FAN

The University successfully executed a project to upgrade outdated high-power consumption exhaust fans (approximately 80 watts) with new energy-efficient BLDC exhaust fans, significantly reducing power consumption to around 20 watts. These advanced exhaust fans optimize ventilation through cutting-edge technology, effectively removing stale air and moisture with minimal electricity usage. Incorporating intelligent features like motion sensors and timers, they operate efficiently to conserve energy. Beyond cost savings, these fans improve indoor air quality and contribute to eco-friendly, sustainable living environments. This initiative reflects the University's commitment to embracing energy-efficient solutions for a more environmentally conscious and resource-efficient campus

ENERGY SAVING PROJECT #5:
ENERGY EFFICEINET BLDC CEILING FAN

The University executed a project to replace old, high-power consumption fans with BLDC ceiling fans, representing a notable advancement in energy efficiency and performance. Diverging from traditional fans, BLDC ceiling fans utilize brushless motors, minimizing friction and energy loss. This results in a substantial reduction in power consumption, translating to lower energy bills. Renowned for their silent operation, durability, and extended lifespan, these fans come equipped with advanced features such as remote control and

variable speed settings, providing enhanced customization and convenience. Embracing sustainability, BLDC ceiling fans contribute to eco-friendly living by optimizing energy usage, seamlessly blending modern comfort with environmental consciousness in contemporary spaces

- **ENERGY SAVING PROJECT #6: CENTRALIZED VRF AIR-CONDITIONING**

University implemented a project of installing Centralized VRF Air-Conditioning. University install 856 HP of VRF Air – Conditioning system which reduces the electricity consumption by 28% Centralized Variable Refrigerant Flow (VRF) air conditioning systems represent a cutting-edge solution for efficient climate control in large buildings. This innovative HVAC technology allows for the centralized management of heating and cooling by varying the refrigerant flow to individual indoor units. With precise temperature control in different zones, centralized VRF systems enhance energy efficiency, ensuring optimal comfort while minimizing energy consumption. These systems offer flexibility, adaptability, and ease of maintenance, making them ideal for commercial and multi-zone applications. The ability to simultaneously cool and heat different areas contributes to a comfortable and energy-efficient indoor environment, aligning with modern sustainability goals.

- **ENERGY SAVING PROJECT #7:**
  SENSOR – BASED ENERGY CONSERVATION

- **Automatic Sensors:** These sensors are being installed on submersible pumps, motors, and fountains. They are noted for their ability to reduce electricity and water waste, as well as lower labor costs. This suggests a move toward automation and resource efficiency.

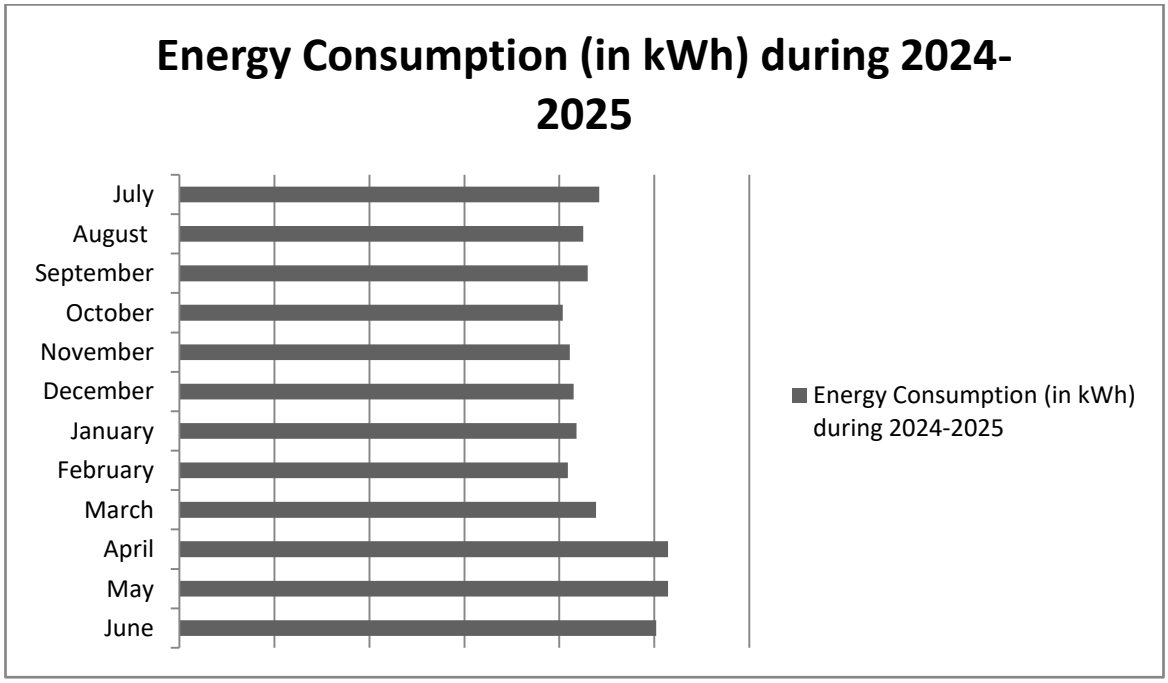
- **LEDs:** The mention of "installing LED on submersible pump, motors, fountains etc." implies the use of energy-efficient lighting in these applications. The information provided highlights the use of automation and energy- efficient technologies to improve efficiency reduce waste, and lower operational costs.

- **PIR motion Sensor and Light**: This sensor lights are highly effective at saving energy because they prevent lights from being on unnecessarily. Instead of requiring a person to remember to flip a switch, the sensor acts as an automated switch. This is especially useful in areas with intermittent use, such as by only activating when needed, PIR sensors can significantly reduce the total operational hours of a light fixture. For instance, a light that might be left on for 12 hours a day could be reduced to just a few hours of actual use. This can lead to energy savings of 30% to over 90% depending on the application and how often lights would otherwise be left on.

MONTHLY ENERGY TABLE

Energy Consumption (in KWh) during 2024-2025

Month	Year	Total Energy (KWh)	Solar Energy (kWh)	Grid Energy (kWh)
July	2024	884	641	243
August	2024	850	613	237
September	2024	850	618	232
October	2024	807	570	237
November	2024	822	574	248
December	2024	803	567	236
January	2025	814	569	245
February	2025	808	576	232
March	2025	877	690	187
April	2025	918	782	136
May	2025	987	796	191
June	2025	1004	794	210
Total		**10424**	**7790**	**2634**



CHITKARA UNIVERISTY, PUNJAB

ELECTRICAL DEPARTMENT TEAM