CHITKARA UNIVERSITY

CHITKARA UNIVERSITY Centre of Excellence for Sustainability

ENERGY REPORT

CHITKARA UNIVERSITY, PUNJAB

2023-2024

OVERVIEW - ENERGY SAVING MEASURES AT CHITKARA UNIVERSITY

CHITKARA UNIVERSITY

ENERGY SAVING MEASURES AT CHITKARA UNIVERSITY

01 SOLAR PANELS

Installed solar panels with capacity of 850 KW.
Energy saving = 29%

02 LED LIGHTS

Replaced incandescent lights with more energy efficient LED lights.
Energy saving = 50%

03 BLDC CEILING FANS

Replaced commercial ceiling fans with the Brushless DC ceiling fans.
Energy saving = 36%

04 VRF AIR CONDITIONING

Replaced the ductable air conditioners with variable refrigerant flow.
Energy saving = 28%

05 BLDC EXHAUST FANS

Replaced the commercial exhaust fans with the Brushless DC exhaust fans.
Energy saving = 72%

06 HEAT PUMPS

Replaced water heater tanks with the heat pumps. Energy saving = 81%

Automatic Sensors have been installed on street lighting system, submersible pumps, motors, fountains etc.

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, substation-1 with 2600 kVA Contract Demand and Substation-2 with 400 kVA Contract Demand. Three transformer of 2000 kVA, 1250 kVA, 1250 kVA for Substation-1 and 500 kVA substation-2 is installed.

ENERGY SAVING PROJECTS IMPLEMENTED BY THE UNIVERSITY

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

ENERGY SAVING PROJECT #1: ROOFTOP SOLAR SYSTEM OF 850 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 from 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.

Pictures of Solar Panels at Chitkara University

ADDITIONAL SOLAR CAPACITY

July 2023 to June 2024				
S.No.	Description	Location	Capacity	Qty
1	Solar Power Plant	Rockefeller Block	100Kwp	1
2	Solar Power Plant	Edison Block	50 Kwp	1
Total			150 KWp	

ENERGY SAVING PROJECT #2: HEAT PUMP

The University successfully executed a project involving the installation of almost 26 Heat Pumps with various capacities. 81.25% energy is being saved using heat pumps 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 pumps 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 Pumps actively contribute to minimizing carbon footprints and endorsing environmentally conscious temperature regulation solutions.

Pictures of Heat Pumps Installed in the Campus



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

Cost Savings:
Heat pumps 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.

Environmental Impact:
Heat pumps produce fewer greenhouse gas emissions compared to electrical resistance heaters. They utilize ambient air or ground temperature to heat water, reducing the overall environmental impact.

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.

Consistent Performance in Cold Weather:
Unlike some traditional electric heaters that may struggle in cold climates, heat pumps can maintain relatively high efficiency even in colder temperatures, making them suitable for various climates.

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.

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 electric heaters, especially in regions with high electricity costs.

Reduced Peak Demand:

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

NEW HEAT PUMP INSTALLATION INSIDE THE CAMPUS.

April 2022 to March 2023		
Sr. No	**Description**	**Qty**
1	Commercial Heat Pump	3
2	Commercial Heat Pump	1
3	Commercial Heat Pump	5
4	Commercial Heat Pump	1
Total Amount		**10**

April 2023 to March 2024		
Sr. No	**Description**	**Qty**
1	Commercial Heat Pump	1
2	Commercial Heat Pump	10
3	Commercial Heat Pump	5
Total Amount		**16**

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 2023-24. 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 2023 – June 2024)

All the lighting fixtures in the University are energyefficient lighting fixtures.

Energy Efficiency Appliances

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

Pictures of the Energy Efficient Lighting Fixtures

ENERGY SAVING PROJECT #4: ENERGY EFFICIENT BLDC EXHAUST FANS

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 60 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: CENTRALIZED VRF AIR-CONDITIONING

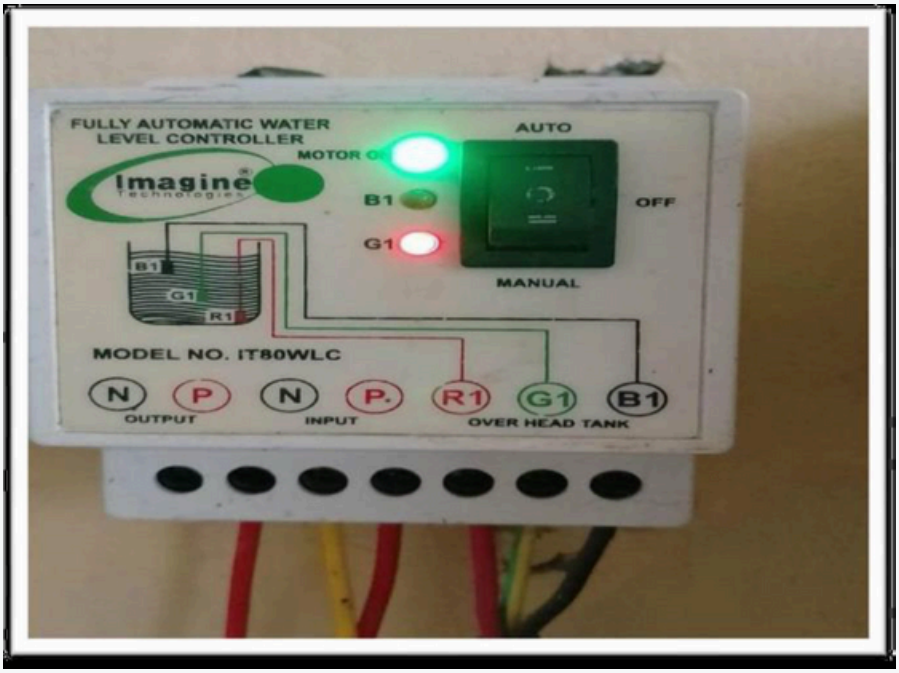
University implemented a project of installing Centralized VRF Air-Conditioning. University install 686 HP of VRF Air – Conditioning system which reduces the electricity consumption by 30% Centralized Variable Refrigerant Flow (VRF) air conditioning systems represent a cutting-edge solution for efficient 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.

Some Pictures



ENERGY SAVING PROJECT #6 : SENSOR-BASED STREET LIGHT CONTROL

The street lighting system, main motor, fountain motor, high mast etc. all work through DPET (Digital Programmable Electronic Timer) Technology. Automatic Sensors have been installing LED on submersible pump, motors, fountains etc. It reduces the wastage of electricity as well as water wastage. It also helps to reduce the labour cost.



PICTURE OF SENSOR-BASED STREET LIGHT CONTROL

MEET THE TEAM