Plans for Energy-Efficient Building Upgrades

ENERGY EFFICIENT BUILDING MANAGEMENT

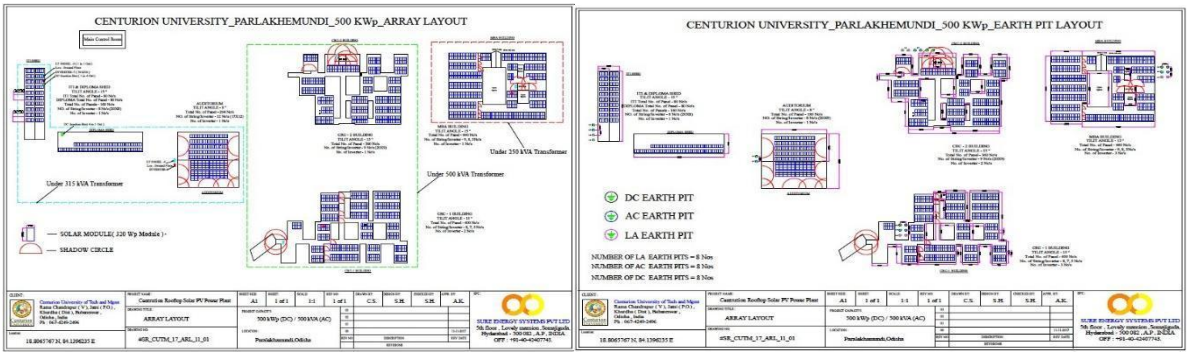
The university actively pursues energy-efficient practices and has laid out a clear roadmap and action plan for upgrading its existing buildings and facilities through:

1. Energy efficient and technological innovation,
2. Renewable energy integration, and
3. Smart infrastructure management.

Renewable Energy Integration

Solar Panels Fixed

The University operates with a contracted electrical power demand of 850 kVA. The campus records an annual average electrical energy consumption of approximately 9,511.68 kVA. To enhance energy sustainability, the university has installed a rooftop solar photovoltaic (PV) system with a total capacity of 500 kWp (DC) / 400 kW (AC). The solar PV installations are strategically distributed across several key buildings: CRC-1 (100 kW AC), CRC-2 (100 kW AC), the Veterinary Building (100 kW AC), the ITI and Diploma Building (60 kW AC), and the Auditorium (60 kW AC).



Solar Panels Array Layout at Centurion University Solar Panel Earth Layout at Centurion University

The University envisions achieving net-zero electricity consumption from non-renewable sources by 2030, aligning with SDG 7 – Affordable and Clean Energy and the National Solar Mission.

- Increase renewable energy share to 75% of total annual energy demand by 2030.
- Achieve carbon neutrality in electricity consumption by 2035.
- Integrate renewable energy systems with smart grid and energy storage solutions.
- Establish the campus as a living laboratory for clean energy research and innovation

Solar panels fixed in the Top of the Building

Solar Panel Layout at Centurion University

Solar Panels Fixed in the top of the Main Building at Centurion University

Solar Micro-Grids Installed at Centurion University

Centurion University has implemented a solar microgrid system with a capacity of 2 × 16.25 kWp. The energy generated by this system is directly connected to the Centurion Market Complex, enabling the shops within the complex to operate primarily on clean solar power. During the summer months, the microgrid system generates an average of 100 to 110 units of electricity per day, leading to a 95–100% reduction in conventional electricity usage for the connected facilities. This hybrid setup contributes approximately 10% of the campus's total energy mix, demonstrating a successful integration of solar power into commercial and institutional operations.

Solar Microgrid Centurion Market Complex

Energy efficiency is embedded in our facilities management practices. All new construction follows green building norms, and existing buildings are periodically assessed to ensure sustained efficiency and to integrate new solutions when possible.

Energy-Efficients Upgrades

Building Lighting Upgrades

One of the earliest steps in this journey was the large-scale replacement of traditional lighting systems with energy-efficient LED solutions started in 2023-24. At the Paralakhemundi campus alone, over 6500 LED fittings have been installed 2023, while the Bhubaneswar campus features approximately 4128 LED bulbs and tubes. The Rayagada and Bolangir campuses have also adopted this shift, with 160 and 402 LED fixtures, respectively. This transition not only cuts down on power usage but also significantly extends the operational life of lighting systems.

Taking innovation a step further, Centurion University has developed its own in-house LED bulb, engineered with a low power consumption SMPS (Switched-Mode Power Supply) circuit. These university-designed LEDs are now being installed in every room on campus, offering a sustainable and cost-effective lighting solution. To further its energy conservation efforts, the university replaced outdated fluorescent lamps with LED tubes, each change saving approximately 22W per fitting.

Solar Street Lighting

Additionally, 165 solar-based CFL/LED street lights now illuminate the Paralakhemundi campus, harnessing renewable energy and reducing dependency on the grid. Beyond lighting, Centurion University has taken critical steps in upgrading other energy systems. Old motors across campuses have been replaced with high-efficiency IE3 motors, and smart meters have been installed to enable real-time monitoring and management of energy usage. Moreover, the university has deployed energy-efficient fans and air conditioners, reducing overall electricity demand without compromising comfort.

Solar Street Lights Installed inside the Campus

Centurion University's Journey Toward a Sustainable and Energy-Efficient Campus

The University is leading the way in campus sustainability through its commitment to clean energy and resource efficiency. By integrating innovation with environmental responsibility, the University has transformed its campuses into models of green infrastructure. From solar power generation to energy-efficient systems developed in-house, Centurion University's initiatives reflect its mission to create not just skilled graduates, but responsible global citizens.

The following account by Dr. Anita Patra, Registrar, captures this inspiring journey toward a sustainable future.

"As the Registrar of Centurion University of Technology and Management, I have always believed that true leadership in education must include a commitment to sustainability. Over the past few years, I've witnessed and actively guided our campuses through a remarkable transition toward energy efficiency and environmental responsibility. One of our earliest initiatives was replacing all conventional lighting with energy-efficient LED systems. At our Paralakhemundi campus, more than 6,500 LED fittings now brighten our buildings, while our Bhubaneswar campus features over 4,100 LED lights. Even our smaller campuses—Rayagada and Bolangir—have joined the movement with hundreds of LED fixtures installed. What fills me with pride is our in-house innovation. Our students and faculty collaboratively developed LED bulbs integrated with low-power SMPS circuits. These are not just sustainable—they represent Centurion's ability to innovate from within. Every room across our campuses is now being fitted with these homegrown solutions. In addition, we've swapped out old fluorescent tubes with modern LEDs, saving around 22W per fixture. Lighting isn't the only area we've targeted. Our campuses now boast 165 solar-powered streetlights, reducing dependence on the grid and embracing clean energy. We've also upgraded outdated motors to IE3 energy-efficient variants and installed smart meters for real-time tracking of power use. Even our fans and air conditioning systems have been replaced with energy-saving models—proof that comfort and conservation can go hand in hand. As an administrator, what excites me most is not just the reduction in electricity bills or carbon emissions. It's knowing that every light switch flipped, every cool breeze from an efficient fan, and every project undertaken contributes to a deeper cultural shift—one that prepares our students to be not just professionals, but responsible global citizens. This journey is far from over, but with each step, Centurion University moves closer to becoming a model for green campuses in India" – Dr. Anita Patra (Registrar-Centurion University)

Rain Water Harvesting System

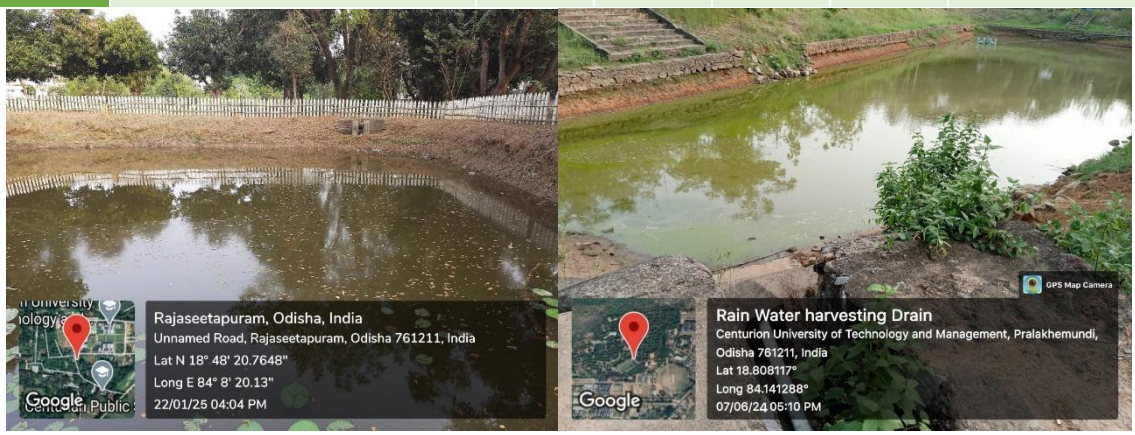
The University has been installing a slanted tin rooftop to facilitate effective rainwater harvesting by directing rainwater into gutters and storage tanks. This collected water is used for irrigation, flushing toilets, and drinking after treatment. It conserves water, reduces groundwater and municipal supply dependency, and helps mitigate urban flooding. The Bhubaneswar campus, receiving 1500 mm of annual rainfall, saves around 75 million liters of rainwater annually with a 50,000 sq. mt. harvesting system, promoting sustainable water management.

Rain Water Harvesting Point-01

Rain Water Harvesting Point-02

Six percolation ponds have been constructed on second and third order streams over fractured and weathered rocks, facilitating effective water conservation and carbon capture through improved green cover.

Pond No.	Location	Length (m)	Width (m)	Area (m^2)	Depth (m)	Total Capacity (m^3)
	Paralakhemundi Campus:					
1	Near STP No. 4	90	40	3600	1.8	6480
2	Opposite to VC Bungalow	20	20	400	1.8	720
3	Tribal Village	35	20	700	3	2100
4	Near FMP lab	82	21	1722	3	5166
5	Near MBA building	27	11	297	3	891
6*	Near Cowshed	56	38	2128	3	6384
					Total	**21741**

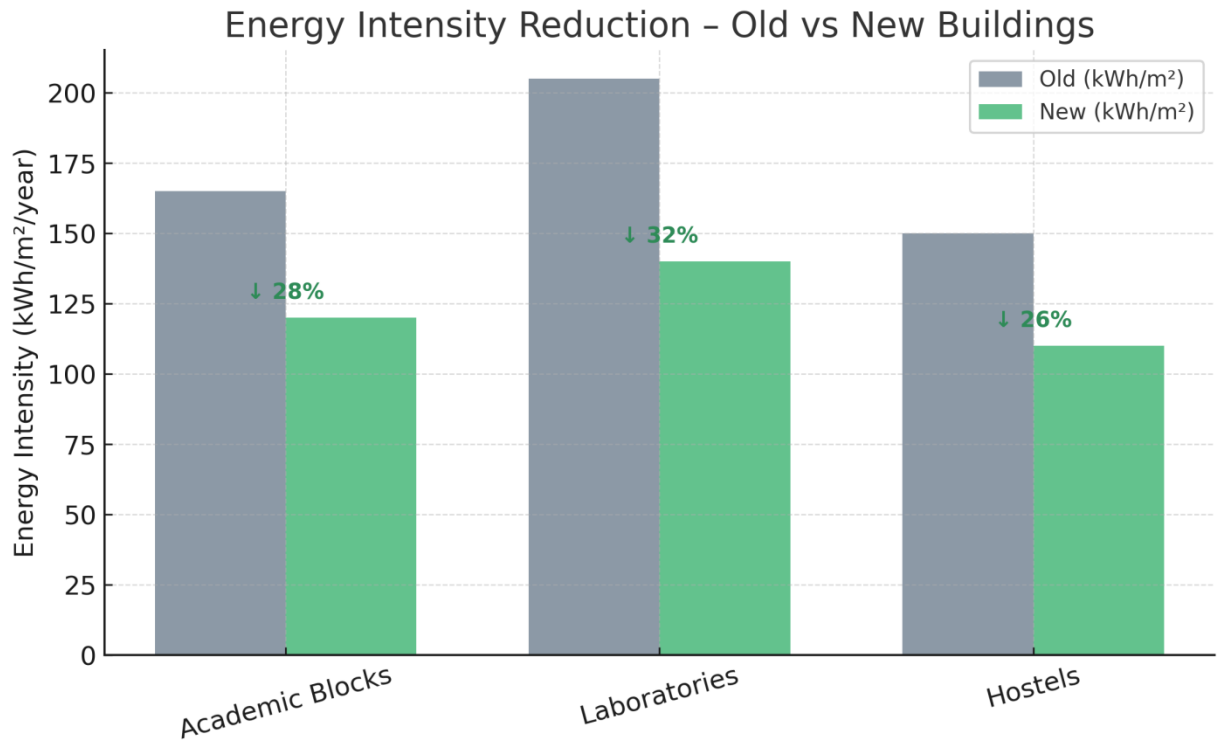


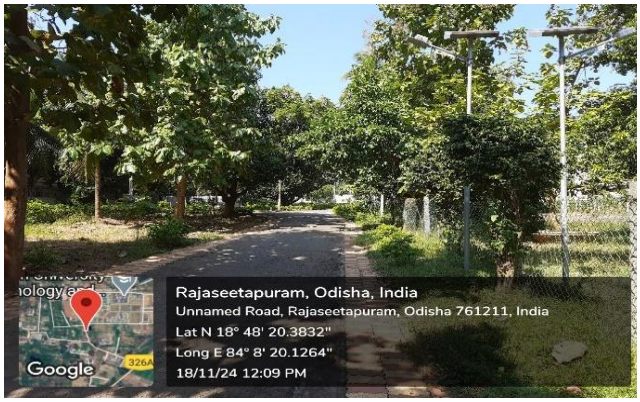
Rain Water harvesting Drains

Centurion University's new academic and hostel buildings adopt green design standards:

- Day lighting & natural ventilation optimization
- Green roofing and micro-forestry (1,000+ saplings)
- Building energy intensity reduced by 30%

Building Type	Energy Intensity (kWh/m²/yr)	Reduction vs Baseline
New Academic Blocks	120	28%
Laboratories	140	32%
Hostels	110	26%






Green Campus and Micro-forest at Centurion University