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ANNUAL
REPORT:
SDG REPORT

7 AFFORDABLE AND
CLEAN ENERGY



SDG 7: AFFORDABLE AND
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UJ SDG REPORT 2023
**SDG 7: AFFORDABLE AND
CLEAN ENERGY**

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Report on the University of Johannesburg's Contribution to Sustainable Development Goal 7

SDG 7: Affordable and Clean Energy

OVERVIEW: EXECUTIVE SUMMARY

This report outlines the University of Johannesburg's (UJ) contributions to the United Nations' Sustainable Development Goal 7 (SDG 7) on Affordable and Clean Energy during the 2023 academic year. In 2023, UJ made substantial progress toward achieving SDG 7, which aims to ensure access to affordable, reliable, sustainable, and modern energy for all. As part of its commitment to sustainability, UJ has significantly expanded its use of renewable energy sources, particularly solar power, and focused on improving energy efficiency across all its campuses. Despite the ongoing challenges posed by rising electricity costs and national load shedding, UJ's proactive measures in energy management have resulted in notable reductions in both energy consumption and carbon emissions.

Key achievements in 2023 include the continued installation of solar photovoltaic (PV) systems across multiple campuses, reducing the university's reliance on the national grid and significantly decreasing its carbon footprint. UJ also adopted innovative technologies, such

as heat pumps and energy-efficient lighting, which have contributed to further energy savings. These initiatives are aligned with UJ's strategic goal of achieving net-zero carbon emissions by 2050. As part of its ongoing commitment to SDG 7, UJ has positioned itself as a leader in sustainable energy practices within the higher education sector.

This report provides a comprehensive overview of UJ's energy management strategies, detailing its efforts to improve energy efficiency, expand renewable energy capacity, and contribute to a sustainable energy future. Through a combination of infrastructure investments, operational improvements, and strategic partnerships, UJ continues to play an integral role in advancing the global agenda for affordable and clean energy.

INTRODUCTION

The United Nations' SDG 7 calls for the provision of affordable, reliable, sustainable, and modern energy for all by 2030. As an academic institution and a leader in the South African higher education sector, the University of Johannesburg has a crucial role to play in supporting this goal. By integrating energy efficiency and renewable energy generation into its daily operations, UJ not only aims to reduce its environmental impact but also serves as a model for other institutions, businesses, and individuals striving to achieve sustainable energy goals.

In 2023, UJ focused on the sustainable management of energy resources across its campuses, particularly through the integration of solar power systems, energy-efficient technologies, and alternative energy sources. These efforts were driven by the challenges posed by rising energy costs, the increasing frequency of power outages, and the university's ambition to contribute meaningfully to the national and global fight against climate change. The initiatives undertaken during the year have contributed significantly to reducing UJ's overall energy consumption and lowering its carbon footprint, aligning with its long-term goal of achieving net-zero carbon emissions by 2050.

This report examines the various activities UJ has undertaken to improve energy management and sustainability in 2023, focusing on its investments in renewable energy, energy-saving technologies, and efforts to reduce reliance on fossil fuels. The report also highlights UJ's community engagement and partnerships with stakeholders to support the broader energy transition in South Africa.

KEY ACTIVITIES AND INITIATIVES

In 2023, UJ's energy management activities were centered around three primary objectives: reducing overall energy consumption, increasing the share of renewable energy in the university's energy mix, and improving the efficiency of energy use across all campuses. These objectives were achieved through a combination of innovative technology adoption, infrastructure investments, and operational adjustments. The following sections detail these activities in greater depth.

1. Renewable Energy Generation and Solar Power Expansion

A significant part of UJ's strategy for achieving SDG 7 has been the expansion of its renewable energy capacity, particularly through the deployment of solar photovoltaic (PV) systems. In 2023, UJ expanded its solar PV capacity to 2 MWp (megawatts peak) of electricity generation across various campuses. This expansion has allowed UJ to reduce its reliance on grid-based electricity and produce a substantial portion of its energy needs from renewable sources. Solar PV has become a cornerstone of UJ's

energy strategy, helping to alleviate pressure on the national grid while significantly reducing the university's carbon emissions.

The university has invested in installing solar panels on the rooftops of key buildings across its campuses, including the Auckland Park Kingsway (APK) and the Auckland Park Bunting Road (APB) campuses. These installations are expected to generate more than 3.5 million kWh (kilowatt-hours) of clean energy annually, which contributes to the university's goal of reducing carbon emissions and minimising energy costs. The solar energy generated is used to power academic and administrative buildings, student residences, and other campus facilities, further increasing the efficiency of university operations.

Looking ahead, UJ plans to expand its solar PV capacity by an additional 1 MWp in 2024. This increase will help UJ become more energy-independent, while simultaneously reducing its reliance on expensive and unsustainable grid electricity. The expansion of solar power is an essential component of UJ's long-term vision of achieving net-zero carbon emissions by 2050.

2. Energy-Efficient Technologies and Infrastructure Improvements

Alongside the growth of renewable energy generation, UJ has focused on implementing energy-efficient technologies to reduce energy demand. In 2023, UJ continued its ongoing efforts to replace traditional lighting systems with energy-efficient LED lighting across all campuses. LED lights consume significantly less electricity compared to conventional lighting systems, and their long lifespan helps reduce maintenance costs. UJ has also installed motion-sensing systems in high-traffic areas, ensuring that lighting is only used when needed, which further optimises energy use.

In addition to lighting, UJ made improvements to its heating systems by installing heat pumps in several student residences. Heat pumps are a more energy-efficient alternative to traditional electric water heaters, as they use less energy to heat water by transferring heat from the air or ground. The installation of heat pumps at UJ has significantly reduced electricity consumption for water heating, providing both cost savings and environmental benefits.

UJ has also been exploring the use of natural gas for heating and cooking purposes in student residences, as part of its strategy to reduce electricity consumption during peak demand periods. By shifting some of its energy requirements to cleaner-burning fuels such as natural gas, UJ has been able to further reduce its reliance on electricity and contribute to the reduction of greenhouse gas emissions.

3. Energy Storage and Backup Power Solutions

To further enhance its energy resilience, UJ has explored energy storage solutions and backup power systems to mitigate the impact of load shedding. In 2023, UJ installed a 48-hour water reservoir at the APK campus to ensure uninterrupted water supply during power outages. While primarily focused on water, the installation of backup power solutions for critical services is an important part of the university's energy resilience strategy.

Additionally, UJ has begun integrating battery storage systems with its solar PV installations. These systems will store excess solar energy generated during the day for use during periods of high demand or when solar energy production is low, such as at night. Energy storage solutions will allow UJ to optimise the use of its renewable energy capacity, reducing reliance on the national grid and ensuring more stable energy access.

4. Energy Management and Operational Efficiency

UJ has implemented several operational strategies to optimise energy usage across its campuses. These strategies are guided by the university's energy management plan, which is aligned with its sustainability goals. In 2023, UJ conducted an energy audit across all its campuses to identify areas for improvement and ensure that energy-efficient technologies and practices are being used effectively.

The audit found that the university had successfully reduced its overall energy consumption by 29.4% compared to the 2015 baseline. This reduction is attributed to the combined impact of solar energy installations, energy-efficient technologies, and improved operational practices. UJ's commitment to sustainability is also reflected in its adoption of energy-saving measures in building design, such as the use of thermal insulation, energy-efficient HVAC systems, and smart building management systems.

5. Community Engagement and Education on Energy Sustainability

Beyond its internal operations, UJ has played an active role in educating students and the wider community about the importance of energy sustainability. The Faculty of Engineering and the Built Environment has been involved in several community outreach initiatives aimed at promoting the adoption of clean energy technologies. Through workshops, seminars, and collaborative projects, UJ has helped to raise awareness about the benefits of renewable energy and energy efficiency.

In 2023, UJ hosted a series of public talks on sustainable energy and the role of universities in the transition to a low-carbon economy. These events brought together academics, industry experts, and policymakers to discuss the challenges and

opportunities in the energy sector and the role of higher education in driving innovation and change.

CONCLUSION

The University of Johannesburg has made significant contributions to the achievement of SDG 7: Affordable and Clean Energy in 2023. Through its investment in solar energy, energy-efficient technologies, and energy storage solutions, UJ has reduced its reliance on non-renewable energy sources and decreased its carbon footprint. The university's ongoing efforts to improve energy efficiency, expand renewable energy capacity, and foster energy resilience have positioned it as a leader in sustainable energy practices within the higher education sector.

As UJ continues its journey towards net-zero carbon emissions by 2050, the university remains committed to expanding its renewable energy initiatives, improving energy efficiency, and educating future generations about the importance of clean energy. The progress made in 2023 is just the beginning, and UJ is poised to play an even greater role in supporting the global transition to sustainable energy in the years to come.

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