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ANNUAL  
REPORT:  
SDG REPORT

9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



SDG 9: INDUSTRY, INNOVATION  
AND INFRASTRUCTURE

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# UJ SDG REPORT 2023

## SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE

# 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



# Report on the University of Johannesburg's Contribution to Sustainable Development Goal 9

## SDG 9: Industry, Innovation and Infrastructure

### OVERVIEW: EXECUTIVE SUMMARY

This report outlines the University of Johannesburg's (UJ) contributions to the United Nations' Sustainable Development Goal 9 (SDG 9) on Industry, Innovation and Infrastructure during the 2023 academic year.

UJ has demonstrated a robust commitment to advancing SDG 9, which focuses on fostering innovation, building resilient infrastructure, and promoting sustainable industrialisation. In 2023, UJ significantly contributed to this goal by enhancing its infrastructure, investing in new technologies, and strengthening collaborations with industry partners to foster innovation and create sustainable economic growth.

Key initiatives in 2023 included the expansion of UJ's renewable energy infrastructure through the installation of solar photovoltaic (PV) plants across various campuses, development of smart campus technologies, and increased efforts to foster innovation through the UJ Business Incubator. The university also made strides in providing support for cutting-edge research in fields such

as the Fourth Industrial Revolution (4IR), artificial intelligence (AI), and green technologies, all of which have substantial potential for driving industrialisation and infrastructure development in South Africa.

This report delves into UJ's contributions to SDG 9, detailing the university's role in advancing industry and innovation, as well as its continued investment in sustainable infrastructure. Additionally, it highlights specific activities, achievements, and partnerships that support UJ's mission of fostering a competitive, sustainable, and innovative environment for education, research, and industry collaboration.



## **INTRODUCTION**

Sustainable industrialisation, innovation, and infrastructure are essential components of economic growth and development in the 21st century. SDG 9 calls for increasing infrastructure development, fostering industry growth, and driving innovation as a means to create productive employment and reduce inequalities. As a leading higher education institution in South Africa, the University of Johannesburg is committed to making meaningful contributions to SDG 9 through a variety of initiatives that bridge the gap between education, industry, and sustainable development.

In 2023, UJ continued to strengthen its role as a catalyst for industrial innovation and infrastructure development, both within its own operations and in the broader South African context. With its emphasis on research excellence, technology-driven education, and industry collaboration, UJ is positioned as a key player in driving the future of innovation and infrastructure development in the region. This report explores UJ's initiatives to advance SDG 9 through technological innovation, infrastructure enhancement, research contributions, and collaborative partnerships that support the growth of sustainable industries.

## **TECHNOLOGICAL INNOVATION AND RESEARCH FOR SUSTAINABLE DEVELOPMENT**

UJ has long been recognised for its leadership in promoting technological innovation and advancing research in fields that directly contribute to SDG 9. In 2023, the university continued to prioritise research that not only enhances academic knowledge but also contributes to practical, industry-driven solutions. A significant focus was placed on exploring the potential of Fourth Industrial Revolution (4IR) technologies, including artificial intelligence (AI), robotics, and data science, as well as their applications in industry and infrastructure.

One of the key research initiatives led by UJ in 2023 was the Centre for Artificial Intelligence Research (CAIR). This centre has become a leader in AI and machine learning research, and in 2023, it produced several cutting-edge studies that contribute directly to the industrialisation of South Africa. These innovations have applications in sectors such as manufacturing, health care, and smart city infrastructure, aligning with UJ's goal of using research to drive industrial growth and innovation.

Furthermore, UJ's Research and Innovation Division continued to foster partnerships with local and international industries to commercialise research outputs. For instance, the university collaborated with major companies in the green energy sector, focusing on sustainable industrial practices that contribute to cleaner production methods. UJ's work in green hydrogen research, a promising area for the future of energy and industry, was particularly noteworthy. This collaboration with

the private sector has the potential to revolutionise energy infrastructure and reduce industrial carbon footprints, marking a significant step toward the sustainable industrialisation that SDG 9 calls for.

## **INFRASTRUCTURE DEVELOPMENT: BUILDING THE SMART CAMPUS**

A key component of UJ's contribution to SDG 9 has been the ongoing development of a smart campus infrastructure. Recognising that infrastructure is crucial for fostering economic growth and innovation, UJ has focused its efforts on creating a university environment that is not only conducive to learning and research but also integrates modern technologies that enable sustainable industrial development. The university's vision of becoming a "smart campus" involves the integration of cutting-edge technologies that support both educational and operational excellence.

In 2023, UJ expanded its campus-wide Wi-Fi network, providing high-speed internet access across all campuses. This enhancement of digital infrastructure ensures that students, faculty, and staff are well-equipped to participate in the digital economy, access resources for research, and collaborate seamlessly with industry partners. Furthermore, the university invested heavily in upgrading its digital classrooms, enabling virtual learning, online workshops, and collaborative research platforms, all of which contribute to building a future-ready infrastructure capable of supporting the next generation of industry leaders and innovators.

One of the most significant achievements in infrastructure development was the completion of a solar photovoltaic (PV) system on UJ's campuses. The solar system, with a total capacity of 2 MWp, not only supports UJ's commitment to reducing its carbon footprint but also demonstrates how educational institutions can invest in sustainable infrastructure that meets both energy demands and environmental goals. By generating its own renewable energy, UJ has reduced its dependency on the national electricity grid, contributing to the country's overall sustainability targets.

Additionally, UJ continued its efforts in green building design and the installation of energy-efficient technologies throughout campus buildings. These technologies, including LED lighting and smart thermostats, are part of a broader initiative to reduce UJ's energy consumption while enhancing the quality of the learning and working environment. By embedding sustainable design principles into its infrastructure, UJ is directly contributing to the long-term sustainability of urban environments.

## **SUPPORTING INDUSTRY AND INNOVATION: COLLABORATIONS AND PARTNERSHIPS**

UJ's role in advancing industry, innovation, and infrastructure is greatly enhanced by its strong network of partnerships with both public and private sector organizations. In 2023, UJ continued to work closely with industry leaders to bridge the gap between academia and the business world, creating real-world applications for research and fostering innovation in key sectors such as technology, renewable energy, and smart manufacturing.

The UJ Business Incubator, one of the university's flagship programmes, plays a critical role in supporting the growth of start-ups and entrepreneurs. In 2023, the incubator continued to support innovative businesses in the tech and green energy sectors. Through mentorship, funding, and access to UJ's extensive network, the incubator helped several start-ups scale their operations and create jobs. These businesses, which are often at the cutting edge of innovation, contribute to South Africa's industrial development by introducing new technologies and services that drive economic growth.

In addition to the incubator, UJ collaborated with key players in the automotive industry and renewable energy sector. In 2023, the university worked alongside BMW South Africa on a joint research project focused on the automotive supply chain and the role of sustainable materials in manufacturing. This partnership is an example of how UJ is using research and innovation to drive industrial growth and improve the competitiveness of local industries.

Moreover, UJ's Technopreneurship Centre worked with various corporate partners to commercialize research outcomes, turning ideas into profitable enterprises that contribute to the local economy. This center has played a key role in helping students and faculty members bring their research innovations to market, creating new economic opportunities and contributing to the expansion of South Africa's industrial base.

## **COMMUNITY ENGAGEMENT AND INFRASTRUCTURE DEVELOPMENT**

UJ's contributions to SDG 9 extend beyond the confines of its campuses and into the communities surrounding it. The university has actively engaged in several community-based infrastructure development projects aimed at improving the quality of life and supporting economic growth in underserved areas.

One of the notable initiatives in 2023 was UJ's partnership with local municipalities to implement smart infrastructure solutions in informal settlements. This collaboration, which focused on improving access to basic services such as water, energy, and waste management, is a clear example of how UJ's research and innovation can directly benefit local communities. The use of solar-powered water pumps and biogas technology helped provide sustainable solutions for residents of underprivileged areas, while also contributing to UJ's goals of reducing urban energy consumption and improving infrastructure resilience.

Through initiatives like these, UJ is not only contributing to the local economy but is also actively addressing social inequality by creating infrastructure that enhances the well-being of marginalised communities.

## **CONCLUSION**

The University of Johannesburg has made significant progress toward achieving SDG 9 in 2023. Through a combination of technological innovation, research-driven infrastructure development, industry collaboration, and sustainable practices, UJ has strengthened its role in advancing industrialisation and fostering economic growth. The university's focus on creating a smart campus, supporting entrepreneurship, and advancing cutting-edge research positions it as a key player in shaping the future of industry, innovation, and infrastructure in South Africa.

As UJ looks to the future, it will continue to build on its achievements in 2023, expanding its contributions to SDG 9. The university remains committed to fostering a culture of innovation, developing sustainable infrastructure, and collaborating with industry partners to ensure that the benefits of innovation and industrial growth are accessible to all. UJ's dedication to SDG 9 ensures that it will remain at the forefront of the efforts to drive sustainable economic growth, industrialisation, and infrastructure development in the years to come.



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