Energy Consumption Report

2018 – 2022

جامعة الملك فهد للبترول والمعادن

King Fahd University of Petroleum & Minerals

MARCH - 2023

Energy Consumption

Saudi Arabia is a country that is known for its vast oil reserves and its focus on energy production. However, with the rise in energy demand, there is a growing concern about the power consumption in various sectors of the country. One of the sectors that require significant energy consumption is the higher education sector. Specifically, universities in Saudi Arabia are known to consume a considerable amount of energy due to their large infrastructure, buildings, and facilities.

University buildings in Saudi Arabia consume a significant amount of power due to their large size and the need to maintain comfortable indoor temperatures in a hot and arid climate. Air conditioning is a major contributor to energy consumption, with cooling needs often exceeding those of heating. In addition to air conditioning, lighting, equipment usage, and water heating also contribute to energy usage in university buildings. King Fahd University of Petroleum & Minerals (KFUPM) is one of the leading universities in the country and is renowned for its research in the fields of engineering, science, and technology. However, with its vast campus, state-of-the-art facilities, and high-tech laboratories, KFUPM's energy consumption is also significant.

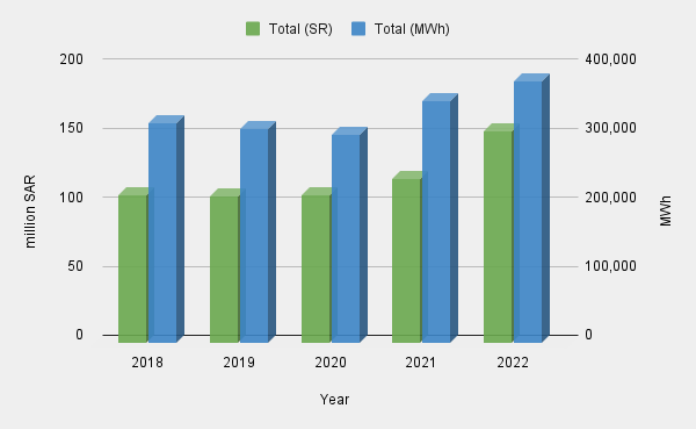

Figure 1. Annual electricity bill and annual electricity consumption of the university campus

This high energy consumption has led to concerns about the environmental impact of the university, as well as the cost of energy consumption. To address this issue, KFUPM have implemented energy efficiency measures such as using LED lighting, installing energy-efficient HVAC systems, and promoting energy-saving habits among faculty, staff, and students. These efforts not only help reduce energy consumption and costs but also contribute to the country's overall energy sustainability goals.

It can be seen from Figure 1 that the total annual electricity consumption has increased from 318 GWh in 2018 to 380 GWh in 2022. The increase is mainly due

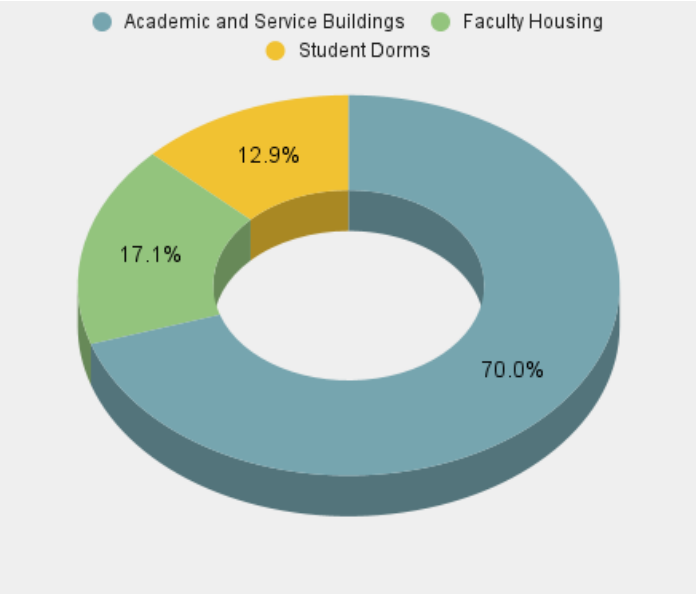

Figure 2. Electricity consumption share by different types of buildings in 2022

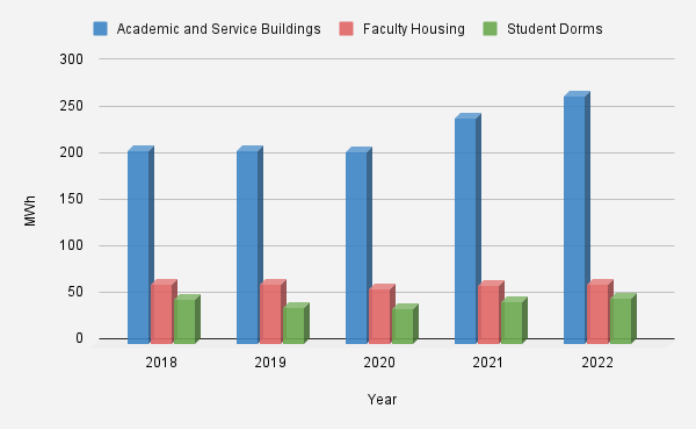

Figure 3. Annual electricity consumption in (i) Academic and Service Buildings, (ii) Faculty Housing, and (iii) Student Dorms

to the expansion projects of the university. New R&D buildings at DTV, CPG and Female Dorms Phase-1 were energized in 2021, while in 2022 R&D buildings at DTV, Data Center, and Female Dorms Phase-2 were energized. Around 70% of the total energy consumption is in Academic and Service buildings (Figure 2) as of in 2022.

Figure 3 shows that the energy consumption increased mostly in academic and service building while for the housing and dorms it remained almost same. Energy consumption in student dorms is particularly lower in 2020 due to online classes during corona pandemic, while increased considerably in 2021 and 2022 due to commissioning of female dorms phase-1 and phase-2, respectively. It should be noted that the university is constantly replacing older components and equipment with more energy efficient ones.