THE Impact Ranking 2023

University: Al-Mustaqbal University

Country: Iraq

Web Address: https://uomus.edu.iq/en/default.aspx

SDG 7.2: University measures towards affordable and clean energy

7.2.2: Does your university as a body have plans to upgrade existing buildings to higher energy efficiency?

Plan of upgrading existing buildings to higher energy efficiency Policy

Al-Mustaqbal University (MU) is embarking on a journey towards heightened energy efficiency, aligning with the ethos of green building principles. The initiative underscores the imperative of energy conservation and management to foster a culture of energy saving across the campus. Transitioning from conventional appliances, the university has embraced energy-efficient alternatives, setting a precedent in sustainable operations.

The overarching goal is to mold a sustainable university ecosystem reliant on clean and affordable energy by 2030. This endeavor is in sync with the United Nations Sustainable Development Goal-7 (UN SDG-7), aiming to significantly reduce energy consumption while promoting the adoption of renewable energy sources and efficient appliances.

The target set forth is to achieve 100% utilization of energy-efficient appliances by 2030, marking a significant milestone in MU's sustainability agenda.

MU’s energy consumption program is bifurcated into two core segments:

1. Awareness Campaign: An educative initiative targeting students, staff, and the surrounding community, accentuating the significance of energy conservation, climate change, and global warming. This facet leverages various channels including posters, conferences, and social media to disseminate knowledge and stir consciousness regarding energy reduction.

2. Technical Industrial Applications: This segment is geared towards enriching students' academic experience through hands-on projects during their undergraduate studies. These applied research projects, interfacing with private and public sector entities like the ministry of electricity and oil, are intended to be conduits for practical learning and contribution towards energy management solutions.

In a concerted effort to phase out conventional appliances, the university envisages replacing them with high-efficiency alternatives by 2030. The incorporation of these appliances not only curtails electricity usage but plays a pivotal role in advancing energy conversion and management practices on campus.

Al-Mustaqbal University is committed to advancing its energy savings initiatives by meticulously focusing on energy management. Every segment of the institution is encouraged to evaluate its own energy utilization and uncover opportunities for energy conservation through measures such as insulation, the use of LED lighting, and the integration of sustainable technologies. The following tables explain that:

Appliance usage in 2021

Items	Appliance	Total Number	Total number energy Efficient appliances	Percentage
1	**Lighting**			
	Indoor light bulbs: replacing Halogen light bulb with LED	3800	3550	93%
2	**Heating and cooling**			
	Fan	150	95	63%
	Air conditioners	320	195	60%
	Fan ceiling	650	465	69%
3	**Office equipment**			
	Computers	600	480	80%
			Average Percentage	**73%**

Appliance usage in 2022

Items	Appliance	Total Number	Total number energy Efficient appliances	Percentage
1	Lighting			
	Indoor light bulbs: replacing Halogen light bulb with LED	5800	5550	95.7%
2	Heating and cooling			
	Fan	250	195	78%
	Air conditioners	480	395	82.3%
	Fan ceiling	650	565	87%
3	Office equipment			
	Computers	600	480	80%
			Average Percentage	**84.6%**

Appliance usage in 2023

Items	Appliance	Total Number	Total number energy Efficient appliances	Percentage
1	Lighting			
	Indoor light bulbs: replacing Halogen light bulb with LED	9800	9650	98.46%
2	Heating and cooling			
	Fan	550	525	95.45%
	Air conditioners	850	800	94%
	Fan ceiling	1000	980	98%
3	Office equipment			
	Computers	850	750	88%
			Average Percentage	94.78:%

Al-Mustaqbal University (MU) has successfully actualized its sustainability goals through a series of strategic implementations across its campus:

1. Solar panels have been installed to power the campus buildings, creating a reliable source of renewable energy.
2. A wind turbine has been employed to provide electrical power for mobile charging and fan operations within the Renewable Energy Laboratory Buildings.
3. Water conservation measures have been adopted to promote efficient use of this vital resource.
4. The campus has seen an expansion of green areas to mitigate indoor health risks and enhance the overall environment.
5. Given Iraq's hot and dry climate, the deployment of inverter split units has been pivotal in promoting energy efficiency, subsequently fostering the concept of green buildings.
6. Energy management has been further refined through the incorporation of insulation, LED lighting, and sustainable technology applications.
7. The utilization of windows and skylights not only facilitates natural lighting, reducing lighting loads, but also diminishes the necessity for heating units during winter, thereby conserving energy.
8. Future endeavours include the establishment of a green roof that serves as thermal insulation, reducing cooling loads. The setup will also harness rainwater to nurture plant growth, mitigate storm water runoff, and enhance air quality through carbon dioxide absorption and oxygen release.
9. Plans are underway to introduce a rainwater harvesting system to collect and reuse rainwater, leading to significant water and energy conservation. This harvested water can potentially be utilized for landscape irrigation, cooling towers in HVAC systems, and other applications in line with the Iraqi Governorate policy.
10. The installation of vents and operable windows has enhanced air circulation, improved heating and cooling efficiency, and reduced reliance on HVAC systems by leveraging natural ventilation techniques.

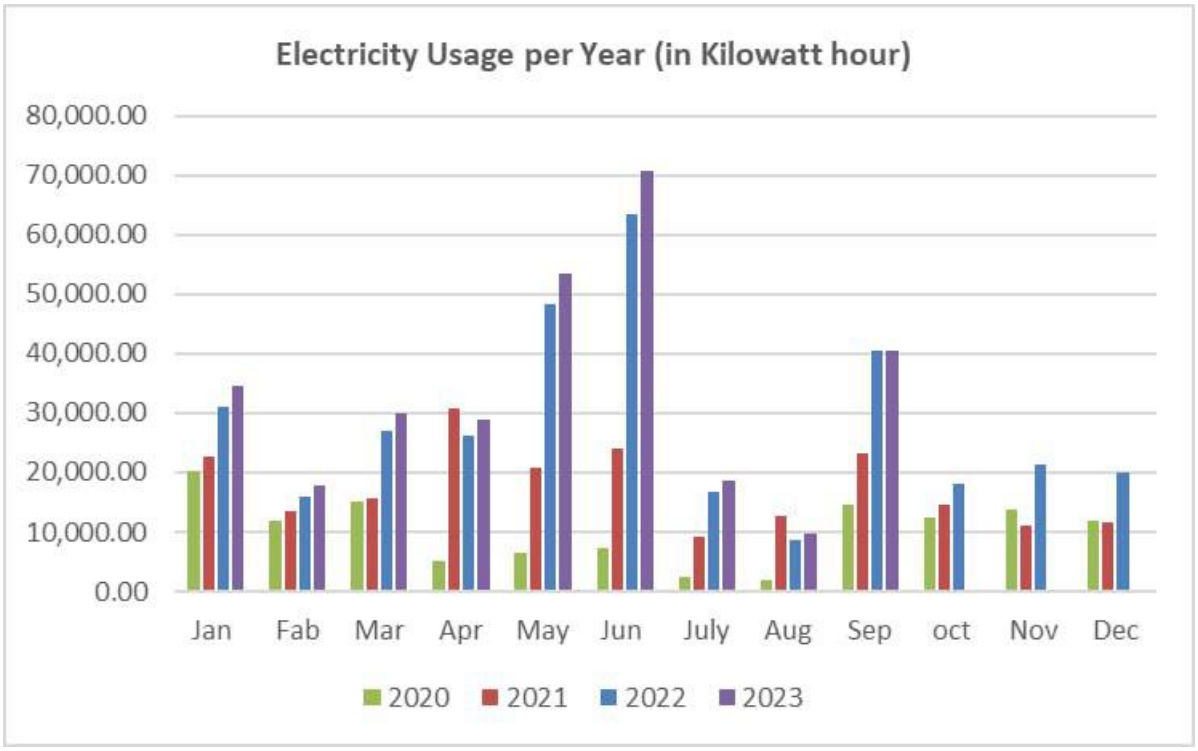
No.	Name	Place	automation		safety				energy		water		Indoor environment				lighting				Building Area (m^2)
			B1	B2	S1	S2	S3	S4	E1	E2	A1	A2	I1	I2	I3	I4	L1	L2	L3	L4	
1	AL-Mustaqbal University College ; Engineering Building A	Babylon , Iraq		x	x	x	x		x		x		x	x		x	x	x		x	٥٠٠
2	AL-Mustaqbal University College ; Medical Building B	Babylon , Iraq		x	x	x	x	x			x		x	x		x	x	x	x	x	15000
3	AL-Mustaqbal University College ; Administration Building c	Babylon , Iraq		x	x	x	x		x		x		x	x		x	x	x	x	x	٢٥٠٠
4	AL-Mustaqbal University College; Physical Education and Sports Sciences Building D	Babylon , Iraq		x	x	x	x				x		x	x		x	x	x	x	x	٣٠٠٠
5	AL-Mustaqbal University College Pharmacy Building	Babylon , Iraq			x	x	x				x		x	x			x	x	x	x	2500
6	AL-Mustaqbal University College Dental Building	Babylon , Iraq			x	x	x				x		x	x			x	x	x	x	2500
7	AL-Mustaqbal University College student club	Babylon , Iraq		x	x	x	x		x		x		x	x		x	x	x		x	3000
8	AL-Mustaqbal University College Nursing building	Babylon , Iraq		x	x	x	x		x		x		x	x		x	x	x		x	2500
	Total																				٣٧٠٠

Smart building implementation

$$\frac{37500}{72800} \times 100\%$$

***Total Building Area: 728٠٠ m^2**

$$\frac{37.500\ m^2}{72800 m^2} \times 100\% = 51,51\%$$


Electricity Usage per Year (in Kilowatt hour)
80,000.00
70,000.00
60,000.00
50,000.00
40,000.00
30,000.00
20,000.00
10,000.00
0.00
Jan
Fab
Mar
Apr
May
Jun
July
Aug
Sep
oct
Nov
Dec
2020
2021
2022
2023

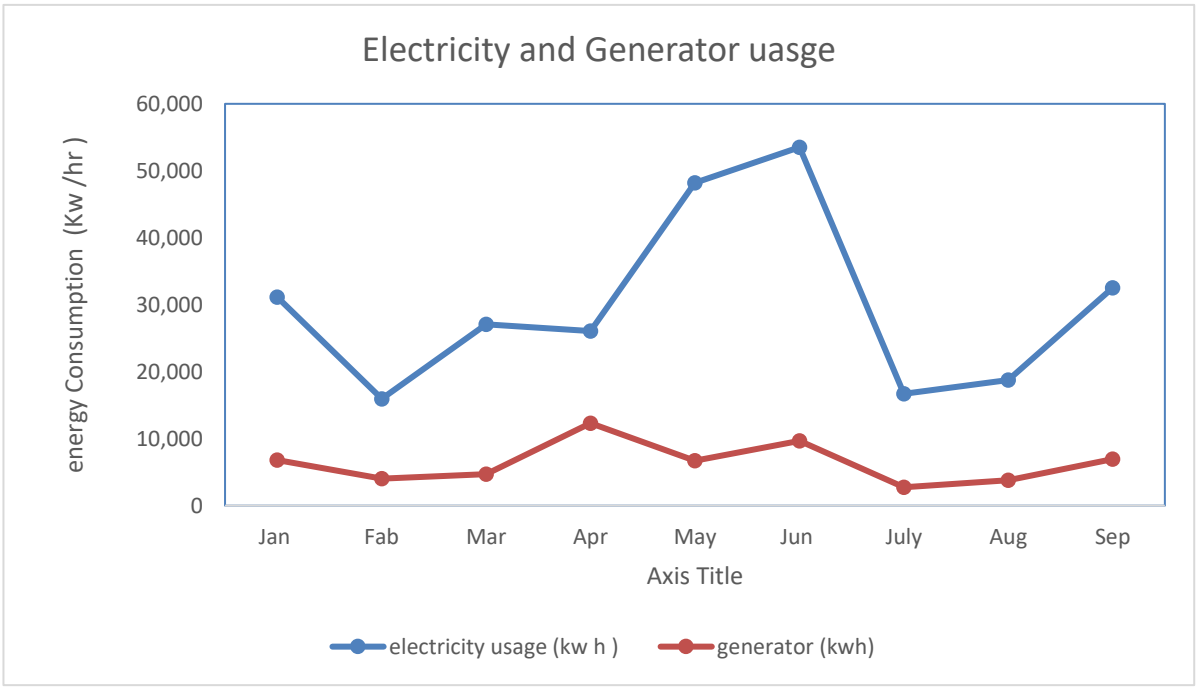
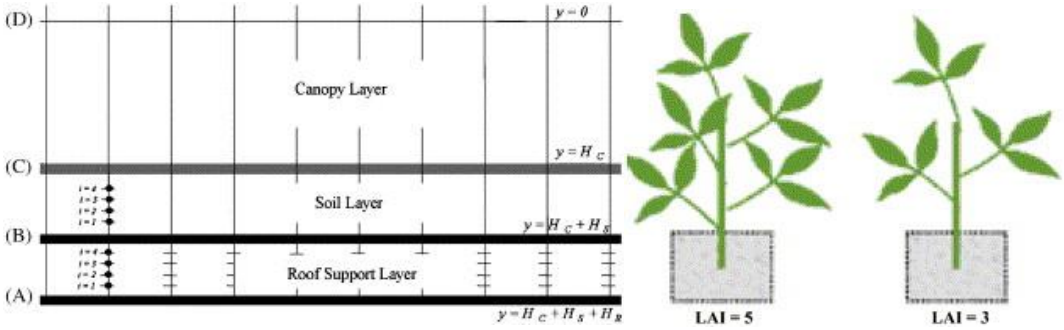

Electricity and Generator uasge
energy Consumption (Kw /hr)
60,000
50,000
40,000
30,000
20,000
10,000
0
Jan
Fab
Mar
Apr
May
Jun
July
Aug
Sep
Axis Title
electricity usage (kw h)
generator (kwh)

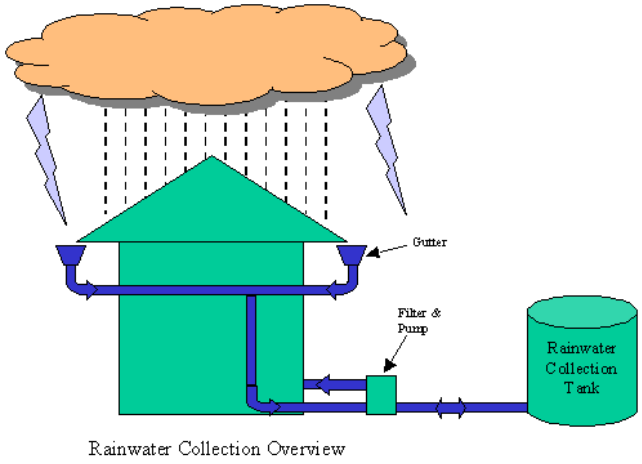
Figure 1. Installation of solar panels on the roofs of the buildings

Figure 2. Horizontal-axis wind generator

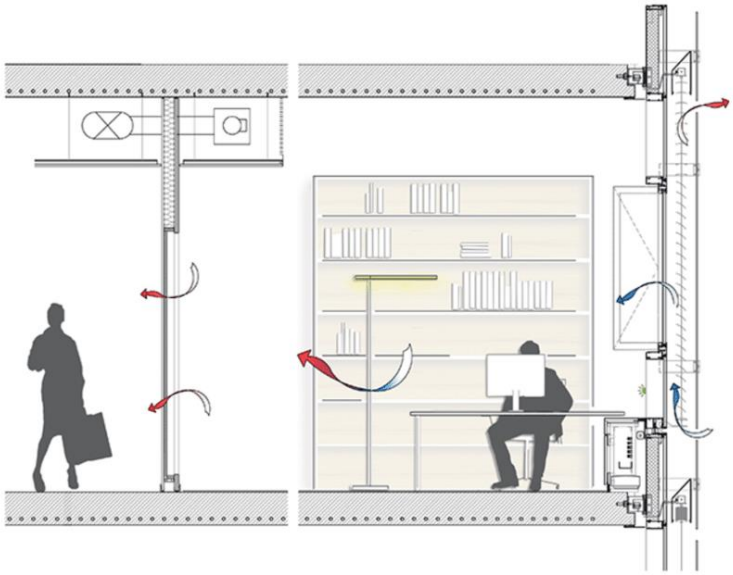
Windows and Skylights



Future work of green roof buildings

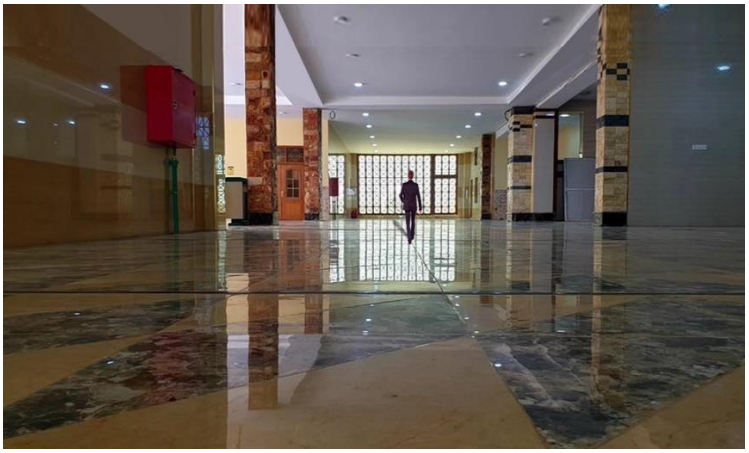


Rain water collector



Vents and operable windows

Solar Photovoltaic (PV) panels for LED lighting and lamps.



Use of LED lighting and lamps with light detection

Installing skylights to allowing sunshiny and natural light flood into the building

Using efficient air conditioning split unit working on the solar panel