

## Energy wastage

Revised December 2023  
Mutah University  
Maintenance and sustainable unit

Mutah University is making many changes and procedures that ensure the rationalization of energy consumption within the university campus through all its operating units. The university has adopted many monitoring stations through a group of executive arms to identify high energy wastage. The table below shows the diesel oil used on the University campus from 2019 to 2022. The developed plans to transform toward the Green University reduced the amount of used oil.

***Toward  
“Green University-Surplus Energy University”***



Table 1: Energy consumption in Mutah University's Faculty and Building.

<i>Buildings Name</i>	<i>2022</i>	<i>2023</i>	<i>Reduction (%)</i>
Presidency Buildings	1234	1212	
Engineering Faculty	18965	20861	
Science Faculty	6543	6213	
Nursing Faculty	4329	4127	
Art Faculty	4789	4176	
Business Faculty	2387	2498	
Law Faculty	4651	4610	
Social Faculty	2564	2542	
Sharia Faculty	1598	1762	
Educational Science Faculty	2012	1721	
Sports Science Faculty	31982	26549	
Medicine Faculty	14289	13932	
Pharmacy Faculty	7439	6894	
Information Technology Faculty	5498	5532	
Agriculture Faculty	15439	15213	
Teaching Halls Complex	49876	38973	
service buildings	25678	21365	
<b>Total</b>	<b>196543</b>	<b>176968</b>	
CO <sub>2</sub>	641	577	
<b>Energy Content (GJ)</b>	<b>7854</b>	<b>7071</b>	<b>-10</b>

Mutah University takes some action to reduce the use of traditional energy, such as:

- Mutah University secures all of its electrical power needs by using photovoltaic cells.
- Mutah University uses electric vehicles instead of traditional ones and is forbidden to use conventional vehicles inside the university campus.
- Mutah University has replaced all traditional lighting units with energy-saving lighting units.
- Mutah University performs periodic maintenance using a settings control program to control fuel amounts.



Table 2: Energy consumption analysis of each University's Building:

	2022			2023			Reduction 2023(%)
	Diesel amount (L)	CO <sub>2</sub> (Ton)	Energy content (GJ)	Diesel amount (L)	CO <sub>2</sub> (Ton)	Energy content (GJ)	
Presidency Buildings	1297	3.5	52	1234	3.3	52	5
Engineering Faculty	19876	53.3	906	18965	50.8	906	5
Science Faculty	7342	19.7	295	6543	17.5	295	12
Nursing Faculty	4987	13.4	210	4329	11.6	210	15
Art Faculty	3987	10.7	176	3789	10.2	176	5
Business Faculty	3412	9.1	150	2387	6.4	150	43
Law Faculty	3764	10.1	176	3651	9.8	176	3
Social Faculty	2456	6.6	154	2564	6.9	154	-4
Sharia Faculty	2789	7.5	99	1598	4.3	99	75
Educational Science Faculty	3456	9.3	112	2012	5.4	112	72
Sports Science Faculty	25671	68.8	1386	21982	58.9	1386	17
Medicine Faculty	13459	36.1	690	14289	38.3	690	-6
Pharmacy Faculty	5671	15.2	280	5439	14.6	280	4
Information Technology Faculty	6231	16.7	245	5498	14.7	245	13
Agriculture Faculty	16543	44.3	647	15439	41.4	647	7
Teaching Halls Complex	53876	144.4	2150	49876	133.7	2150	8
service buildings	27890	74.7	1078	25678	68.8	1078	9

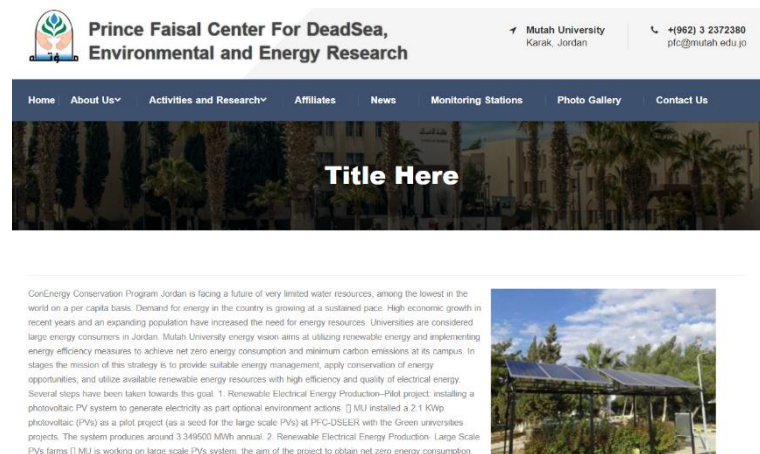
Mutah University's energy vision focuses on adopting renewable energy sources and implementing energy-efficient measures to achieve zero energy consumption and minimize carbon emissions on its campus. This strategy unfolds in stages, with the overarching mission being establishing effective energy management, exploring energy conservation opportunities, and utilizing available renewable energy resources with a strong emphasis on electrical energy quality and efficiency. Several key steps have already been taken toward realizing this vision.

The project's central idea involves comprehensively assessing power and energy quality profiles across the Mutah University campus. This includes examining harmonic distortion, power interruptions, voltage fluctuations, surges, and other power quality concerns. An essential element of this initiative is redistributing electrical energy to specific areas within the campus where it is needed most. This redistribution, guided by an intelligent control system, delivers a cost-effective, reliable, efficient, and sustainable electricity supply without relying on external energy sources, such as the electrical grid.

This concept can be implemented as a stand-alone system on a small scale to assess the energy savings it can offer. Additionally, the university has installed thermal solar systems for water heating at the swimming pool and student housing building, reducing the reliance on electrical energy. These systems efficiently heat water, especially on hot days, contributing to reducing electricity consumption.

Mutah University has embarked on a transformative journey, transitioning from a university that consumes energy to an energy-producing and environmentally conscious institution. This transformation into an energy-efficient, high-performance campus began in 2018 and continues to evolve.

<https://www.mutah.edu.jo/en/pfc/Pages/EnergyConservationProgram.aspx>



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## Title Here

ConEnergy Conservation Program Jordan is facing a future of very limited water resources, among the lowest in the world on a per capita basis. Demand for energy in the country is growing at a sustained pace. High economic growth in recent years and an expanding population have increased the need for energy resources. Universities are considered large energy consumers in Jordan. Mutah University energy vision aims at utilizing renewable energy and implementing energy efficiency measures to achieve net zero energy consumption and minimum carbon emissions at its campus. In stages the mission of this strategy is to provide suitable energy management, apply conservation of energy opportunities, and utilize available renewable energy resources with high efficiency and quality of electrical energy. Several steps have been taken towards this goal. 1. Renewable Electrical Energy Production-Pilot project: installing a photovoltaic (PV) system to generate electricity as part optional environment actions. [] MUJ installed a 2.1 KWp photovoltaic (PVs) as a pilot project (as a seed for the large scale PVs) at PFC-DSEER with the Green universities projects. The system produces around 3.349500 MWh annual. 2. Renewable Electrical Energy Production- Large Scale PVs farms [] MUJ is working on large scale PVs system, the aim of the project to obtain net zero energy consumption

