



University : Northern Technical University
Country : Iraq
Web Address : <https://www.ntu.edu.iq>

13.4.1 - Does your university as a body have a target date by which it will become carbon neutral according to the Greenhouse Gas Protocols?

Commitment to Carbon Neutral University

Climate change poses increasing challenges for energy, water resources, and supply. In response to these challenges, Northern Technical University has implemented a policy that mandates both staff and students to actively participate in efforts to conserve electricity and water. The university approaches water conservation from four interconnected and efficient dimensions while promoting responsible electricity consumption.

- **Energy Efficiency:** Policies should encourage the use of energy-efficient building materials, designs, and technologies to reduce energy consumption during both the construction and operational phases of campus facilities.
- **Sustainable Materials:** The university promotes the use of sustainable and eco-friendly building materials with a lower environmental impact, such as recycled materials and renewable resources, in all construction and renovation projects.
- **Water Conservation:** The university implements policies that require the installation of water-efficient fixtures, rainwater harvesting systems, and landscaping practices that minimize overall water usage across campus.
- **Waste Reduction:** Northern Technical University encourages construction practices that minimize waste generation and promotes the recycling and reuse of construction materials to foster a circular economy on campus.
- **Indoor Air Quality:** Ensuring that university buildings provide a healthy indoor environment is a priority. This includes proper ventilation systems, the use of low-VOC (volatile organic compounds) materials, and effective pollutant control measures.
- **Site Selection:** The university promotes responsible site selection for new developments, aiming to minimize environmental disruption and preserve natural habitats within and around the campus.



Northern Technical University (NTU) is taking significant steps to transition its energy sources from fossil fuels to renewable energy through a comprehensive three-step plan aimed at achieving 100% green energy and zero emissions.

Three-Step Energy Transition Plan

Initial Installation of Photovoltaic (PV) Systems: NTU has begun the installation of photovoltaic panels on university buildings, specifically designed to meet the electrical demand of each building. This step marks the university's commitment to utilizing renewable energy resources effectively.

- ❖ **Expansion of PV Capacity:** By the academic year 2026-2027, NTU plans to install over 8 MW of photovoltaic capacity to fulfill the entire energy demand of the university, including electricity, cooling, and heating. This initiative positions NTU as a pioneering institution in Iraq, aiming to become the first university to achieve 100% renewable energy and zero emissions.
- ❖ **Integration with the National Grid:** By 2027-2028, NTU intends to connect its local electrical grid with the National Grid, allowing the export of surplus energy generated by the photovoltaic systems. This integration aims to reduce the overall emissions associated with electricity production, enhancing sustainability efforts on a larger scale.

Sustainable Solutions for Lighting and Climate Control

- ❖ One significant source of emissions comes from the street lighting system. As part of its sustainability efforts, NTU is leading the way by transitioning to solar-powered street lighting, which operates entirely on solar energy with zero emissions. This initiative is set to be completed by 2025.
- ❖ Given Iraq's extreme temperatures—hot summers and cold winters—efficient heating and cooling systems are crucial for NTU. Between 2024 and 2026, the university plans to implement the following actions to reduce energy consumption for heating and cooling:
 - ❖ **Double-Glazing Windows:** Installation of double-glazed windows across all university buildings will reduce energy waste by approximately 70%.
 - ❖ **High-Efficiency HVAC Systems:** NTU will utilize highly efficient Variable Refrigerant Flow (VRF) systems for heating and cooling, which consume less than 20% of the energy used by conventional systems while providing the same level of comfort.
 - ❖ **LED Lighting:** The internal lighting will be upgraded to LED technology to minimize electrical losses and reduce the heat generated by traditional lighting sources, thereby lowering the cooling energy requirements.



Collaborative Efforts for Community Improvement

- ❖ NTU is dedicated to collaborating with national and international organizations to reduce emissions and enhance community well-being. The university is actively supporting projects that leverage new technologies, such as:
- ❖ Photovoltaics for Water Filtration and Desalination: Implementing systems powered by solar energy to provide clean water solutions.
- ❖ Innovative Heating and Cooling Technologies: Developing systems that utilize solar radiation for efficient temperature control.
- ❖ Additionally, NTU aims to support scientists and researchers in innovating new technologies to mitigate greenhouse gas emissions through its Renewable Energy Research Center (RERC).

Research and Community Awareness Initiatives

- ❖ NTU conducts numerous practical experiments in the Renewable Engineering Department's laboratories, supporting researchers in discovering viable solutions for societal challenges. The RERC focuses on advancing research in renewable energy technologies to foster sustainable community practices.
- ❖ Furthermore, NTU is committed to raising awareness about the importance of environmental stewardship, conducting campaigns at both the university and community levels to promote the planting and care of trees—essential components in the fight against climate change.

Many researches have been published by Northern Technical University under the caption of "Northern Technical University, Iraq "& climate change "you can refer to the link below for more information:

https://scholar.google.com/scholar?start=10&q=%22Northern+Technical+University,+Iraq+%22%26+climate+change+%22&hl=ar&as_sdt=0.5&as_ylo=2022&as_yhi=2023



Northern Technical University Established the Renewable Energy Research Center (RERC)

The Renewable Energy Research Center (RERC) was established in 2023, under the approval of the Ministry of Higher Education and Scientific Research (5223 on 19/6/2023) and the University decree (7/37/7062 on 12/7/2023) issued by the Northern Technical University. The center aims to provide a specialized research center focusing on developing alternative and environmentally friendly energy sources to tackle the challenges of traditional fuel running down. It connects directly with the presidency of the Northern Technical University.

RERC Objectives

The objectives of the Renewable Energy Research Center include but not limited:

1. Developing new techniques for utilizing renewable energy more efficiently.
2. Conducting research involving the study and analysis of climate change impacts and developing sustainable solutions to mitigate them.
3. Raising awareness about the importance of renewable energy and sustainability in Iraqi society.
4. Collaborating with the industrial and governmental sectors to implement new technologies in the field of renewable energy.
5. Providing training and education for engineers and researchers in the field of renewable energy.
6. Encouraging innovation and developing policies that promote the use of renewable energy.
7. Providing consultation and technical support for projects related to renewable energy.
8. Contributing to achieving sustainable energy goals at the local and global levels.



Charge parking at NTU campus





Renewable energy that reduces purchased electricity for Heating water, HVAC systems, and lighting





Adopt healthy and sustainable transportation options (shuttle bus, bicycles, and friendly path-ways)









Programs implemented by Northern Technical University for [wastage recycle](#):

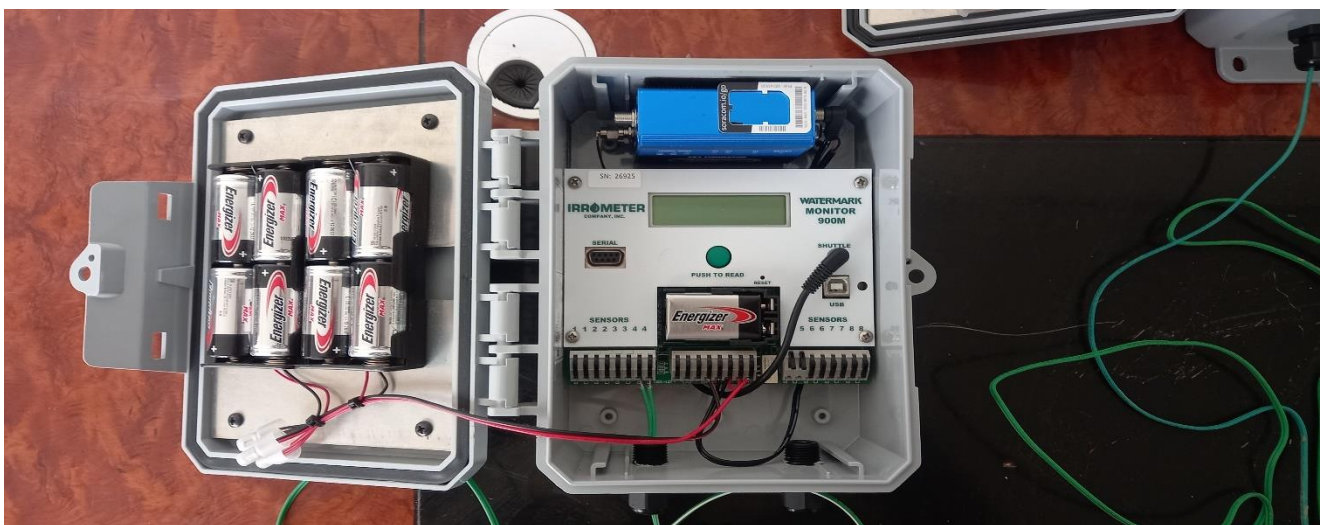








Irrigating plants at the Northern Technical University using Internet of Things technology (IoT) is one of our programs that has been implemented on our campuses for saving water:



The program of water recycling implementation in the main campus of the Northern Technical University consists of recycling waste water to be used for garden sprinkler system along with washing cars, cleaning, and toilet flushing. Moreover, rain water is collected using underground concrete blocks and an artificial lake and several canals that found for the purpose of saving rainwater to be fully-recycled following several stages of water treatment, including sand filtration and UV filtration before flow to tap

<https://drive.google.com/drive/folders/1cEUJqbBG6lFsPAAZCG0kKVfGhGYosJRH?usp=sharing>
<https://ntu.edu.iq/water-conservation-program-implementation/>
<https://ntu.edu.iq/water-recycling-program/>

