جامعة فلسطين التقنية ـ خضوري

Palestine Technical University - Kadoorie

Emissions Report

Executive Summary

Greenhouse Gases Protocol (GHG-P)

2023-2024

Prepared by:

Sustainability Development Office

REPORT OVERVIEW

Palestine Technical University has adopted a globally recognized approach to measuring carbon emissions by implementing the Greenhouse Gases Protocol, the world's most widely used standard for greenhouse gas accounting. This commitment ensures accuracy and consistency in its environmental reporting. In addition to utilizing the Greenhouse Gases Protocol, the university collaborates with various organizations to validate and enhance its reporting standards, including the Accreditation and Quality Assurance Commission for Higher Education Institutions (AQAC) and the Palestinian Energy & Natural Resources Authority (PENRA).

This report provides a detailed summary of:

• **Scope 1 Emissions**: Direct emissions from our campus operations, including fleet and stationary combustion, and the improvements made in these areas.

• **Scope 2 Emissions**: Indirect emissions from electricity have been significantly reduced through our successful transition to renewable energy sources. As of now, we have achieved 75% utilization of renewable energy. We are in the final phase, Phase 4, of our transition plan, and are on track to reach 100% renewable energy usage by 2025. •

• **Scope 3 Emissions**: Focused on transportation-related activities.

At Palestine Technical University, we have taken a significant step toward sustainability by establishing the Sustainability Development Office. This office is dedicated to embedding sustainability not only within our academic curriculum but also across administrative operations and student activities. A key aspect of this effort is the creation of a student-led sustainability club, which actively engages students in sustainable initiatives throughout the university. Additionally, we are proud to offer various programs at the Diploma, Bachelor, and Master levels that are designed to align with sustainability standards. These programs integrate sustainability principles with technological advancements, fostering innovative and impactful solutions across diverse fields.

By systematically documenting our methodologies, data sources, and strategic enhancements across all emission scopes, we strive to maintain transparency and accountability in our sustainability efforts. This approach reinforces our commitment to achieving a **net-zero target** by 2028 or earlier.

Introduction:

Palestine Technical University is proud to present its annual Carbon Emissions Report for the year 2023. As a forward-thinking educational institution, we are deeply committed to sustainability and environmental responsibility. This report reflects our dedication to tracking, measuring, and reducing our carbon footprint, with a strong focus on achieving net-zero emissions.

At Palestine Technical University, we have established the Sustainability Development Office, which plays a crucial role in ensuring that our strategic objectives align with our sustainability targets, aiming for net-zero emissions by 2028 or earlier. This office is dedicated to enhancing the sustainability awareness of our academic staff, increasing our research impact at both regional and international levels, and integrating sustainable practices into our administrative operations and student experiences. Our commitment is further demonstrated through the organization of numerous workshops and training sessions aimed at fostering a culture of sustainability and driving impactful action projects across Palestine.

Our academic programs at Palestine Technical University integrate sustainability principles across all levels, from diploma to postgraduate studies, in fields such as Engineering, Project Management, Architecture, and Renewable Energy. We emphasize the environmental, economic, social, and operational aspects of sustainability in our curricula. These programs aim to cultivate future leaders who seamlessly integrate sustainability with technological innovation, empowering them to drive meaningful environmental and social change.


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Faculty of Engineering & Technology


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PalEV

1- Achievement of 100% Renewable Energy Usage by 2027

Palestine Technical University has made significant progress toward achieving 100% renewable energy usage by 2027, following a carefully planned and systematically executed transition in multiple phases. This journey began with the installation of a solar energy system in four distinct stages, each contributing to an increase in capacity and production.

The first phase, initiated in 2017, introduced a 230-kWp capacity system successfully connected to the grid, laying a strong foundation for future expansions. Building on this success, the second phase was launched in 2018, adding 256 kWp of capacity and significantly boosting the university's renewable energy output. The third phase was launched in 2019 by adding about 30 kWp. The approvals and the designs for the fourth phase have been obtained where an additional capacity of about 500 kWp will be installed. This expansion is crucial not only to meet the university's current energy needs but also to accommodate the anticipated increase in demand due to ongoing campus development.

The plans toward 100% renewable energy depend not only on solar energy. Wind energy and biomass energy are other renewable energy sources but with limited amounts.

As of now, the combined output from these phases supplies about 50% of the university's electricity consumption in 2022 but about 80% of the university's electricity consumption in 2023 due to the Israeli war against the Palestinian forcing us to carry out our teaching online. Fearing for our students lives they were told by the university administration not to come to campus except to carry out the practical sessions. All theoretical lectures were taught on line.

From the initial 230 kW system to the soon-to-be completed 1000 kWp total capacity, Palestine Technical University remains steadfast in its commitment to sustainability and energy independence. The university's transition to 100% renewable energy reflects its dedication to environmental responsibility and its proactive approach to addressing energy consumption challenges while fostering a greener future.

All the main buildings have solar panels mounted on their roofs utilizing otherwise not used space generating 745500 kWh. We also have a wind turbine on one of the roofs (Faculty of Engineering roof) generating 11600 kWh electrical energy and digester to generate bio gas generating 9200 kWh electricity yearly that is installed beside one of the green houses inside the main campus. The electricity generated by the biogas generator to supply the electrical pumps and the smart irrigation system built for this green house. The raw material for this aerobic digester is the agricultural waste as well as any organic waste from the university cafeterias. is The university aims to have all its energy needs from renewable sources. In its master plan all new buildings will have solar panels.

The university is currently considering covering the car park with solar panels thus generating more electricity and using the shadow created by the panels to cover the cars.

The total electricity usage of main campus is 952000 kWh at 2023. The sources of this consumption are: the main grid (185700) and the renewable energy sources (766300 kWh)

Electricity consumption varies from month to month. however, there is a significant increase in power usage in the summer months and winter because of the usage of air conditioning and heating for our class rooms. All the old air conditioning units were replaced with energy saving new units. All buildings are insulated to save energy.

The electricity consumption for the 2023-2024 period was dramatically reduced. This is because of the Israeli war against the Palestinian forcing us to carry out our teaching online. Fearing for our students lives they were told by the university administration not to come to campus except to carry out the practical sessions. All theoretical lectures were taught on line.

Renewable energy portions in 2023-2024 are as follows:

No	Renewable Energy	Production (in kWh)
2	**Biomass**	9200
3	**Solar panel**	745500
4	**Wind turbine**	11600
	Total	**766300**

766300 kWh (Renewable Contribution) / 952000 kWh (Total Electricity usage) = 80.5 %

Some of the renewable energy projects were funded through joint projects with partners from Europe (Czechia) Since the weather in Tulkarm is extremely suitable for solar power with a very high number of hours of day light available in summer. Winter is also very mild with many hours of sunshine.

The increase in the renewable contribution is due to installation of additional PV panels (about 10 kWp).

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Furthermore, the university encourages the use of small electric cars and bikes. The university campus is designed to be walk friendly eliminating the need for the use of any form of transportation thus reducing any harmful emissions. The university is currently building a testing center for electric vehicles thus encouraging the use of electric cars.

The university has a very strict policy for the use of its vehicles. The vehicles are used when large number of professors need to travel. Individual professors are encouraged to use public transportation. The university has its own communication systems where all its correspondence and memos are sent, This system includes all three campuses thus reducing the need for travel between campuses.

2- Methodology

At Palestine Technical University, our approach to measuring carbon emissions is based on adherence to globally recognized standards and methodologies, ensuring accuracy and consistency in our environmental reporting. We follow the principles

outlined by the Greenhouse Gases Protocol (GHG), the world's most widely used standard for greenhouse gas accounting.

Our efforts are acknowledged and validated by several reputable institutions. The Accreditation and Quality Assurance Commission for Higher Education Institutions (AQAC) endorses our methodologies, reflecting our commitment to high standards in environmental responsibility. Additionally, our alignment with the Palestinian Energy & Natural Resources Authority (PENRA) reinforces the credibility of our environmental initiatives and underscores our dedication to sustainability and responsible resource management.

 Scope 1 Emissions: Our evaluation of Scope 1 emissions includes all direct emissions from sources owned or controlled by the university. This covers emissions from the campus fleet, fossil fuels used for heating and other combustion processes within university facilities, and any other direct emissions resulting from our operations.

 Scope 2 Emissions: Scope 2 emissions account for all indirect emissions associated with the electricity consumed by the university. As part of our transition to 100% renewable energy by 2027, we have already achieved about 50% renewable energy utilization (2022), and about 80% in 2023 as the teaching was transferred to online due to war. This shift has significantly reduced our Scope 2 emissions, aligning with our broader sustainability goals.

 Scope 3 Emissions: Our assessment of Scope 3 emissions primarily focuses on transportation-related activities, including emissions from business travel, commuting patterns of students and staff, and vehicles not owned by the university but essential to its operations. By analyzing these factors, we aim to identify key areas for reduction and implement strategic measures to minimize our overall carbon footprint.

In assessing these emissions, we evaluate the carbon intensity of various energy sources utilized across our operations. This includes analyzing the types of fuels consumed, the efficiency of our vehicles and heating systems, and the specific energy mix of our electricity supply, despite it being entirely sourced from

renewable energy. By implementing these methodologies, Palestine Technical University ensures that our emissions reporting remains transparent, verifiable, and aligned with international best practices. This commitment supports our continuous efforts to monitor, manage, and reduce our carbon footprint as we progress toward achieving our net-zero target.

3- Total CO2 (tonnes) Summary

The following table summarizes the CO2 emissions for each of the scopes:

SN	Scope	CO2 emissions (Tonnes)
1	Scope 1	4.22
2	Scope 2	155.988
3	Scope 3	0.7224
	Total CO2 emissions	160.92

To decrease the CO2 emissions from the various sources, the following plans were recommended:

1. Installation of Energy-Efficient On-Site Equipment

Action Taken: Palestine Technical University has to upgrade its on-campus heating systems and replaced outdated boilers with high-efficiency models that consume less energy and produce fewer emissions. This initiative will directly reduce emissions from stationary combustion sources, supporting the university's commitment to lowering its carbon footprint.

2. Implementation of a Refrigerant Management Program

Action Taken: Recognizing the environmental impact of refrigerant emissions, Palestine Technical University has to implement a comprehensive refrigerant management program. This includes regular inspections, maintenance, and upgrades to HVAC systems to prevent leaks and enhance efficiency. These measures will play a crucial role in reducing emissions of potent greenhouse gases associated with air conditioning and refrigeration systems.

3. Fleet Electrification Initiative

Action Taken: Palestine Technical University will launch a campus-wide fleet electrification initiative, replacing all gasoline and diesel vehicles with electric alternatives. This transition will include not only passenger cars but also service and maintenance vehicles used across the campus. To support this shift, multiple EV charging stations will be installed, ensuring convenient access to charging infrastructure.

4. Maximizing On-Site Renewable Energy Generation

Action Taken: Palestine Technical University will expand its solar energy installations across the campus to power additional buildings and facilities. This expansion will also include the integration of energy storage systems to optimize the use of solar power, ensuring a stable and reliable supply of renewable energy even during non-peak sunlight hours.

5. Enhancing Energy Efficiency

Action Taken: The university will implement a comprehensive energy management system to monitor and optimize energy consumption across campus. Recent initiatives include upgrading to energy-efficient LED lighting, installing advanced HVAC systems, and replacing outdated appliances with high-efficiency models. These efforts should significantly reduce the university's overall energy consumption and decreased its dependence on external energy sources.

6. Transition to 100 % Green Power and Renewable Energy

Action Taken: Acknowledging the limitations of on-site renewable energy generation in meeting all its energy demands, Palestine Technical University has committed to sourcing green power from renewable energy providers to cover any additional needs. Additionally, the university invests in Renewable Energy to ensure that 100% of its electricity consumption is offset by renewable energy generated elsewhere. This initiative reinforces the university's support for the renewable energy sector and aligns with its goal of achieving net-zero emissions by 2028.

7. Enhancing Sustainable Procurement Practices

Action Taken: The university has to develop and implement a sustainable procurement policy that prioritizes environmentally friendly products and services with lower carbon footprints. It will engage suppliers by incorporating

sustainability criteria in procurement contracts, encouraging them to disclose their emissions and commit to reduction targets.

8. Expanding Telecommuting and Remote Operations

Action Taken: The university will promote and facilitate remote learning options and telecommuting policies for staff and students to minimize daily commuting. The plan is to invest in a robust IT infrastructure to support effective online learning and virtual meetings, reducing the need for physical travel. The university will implement incentives for students and staff to use sustainable transportation methods, such as biking, public transit, or carpooling, for necessary on-site activities.

9. Offsetting Remaining Emissions Through Credible Projects

Action Taken: The university will identify and invest in high-quality carbon offset projects, including reforestation, renewable energy initiatives, and community-based sustainability programs. The university will also develop on-campus projects that generate carbon credits, such as solar energy installations and sustainable land management practices. One of plans in this context is to establish partnerships with organizations and networks to invest in large-scale environmental projects that offer verifiable carbon offsets.

Through these strategic actions, Palestine Technical University reaffirms its dedication to reducing Scope 1, scope 2, and scope 3 emissions from various sources. By integrating modern technologies, enforcing sustainable policies, and maintaining high operational standards, the university will actively contribute to environmental sustainability and advances toward its net-zero emissions target.