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# INSTITUTIONAL SUSTAINABILITY AND CARBON EMISSIONS REPORT BAKU ENGINEERING UNIVERSITY (BEU)

## Reporting Period: 2024–2026

## 1. INTRODUCTION

Sustainability has become a central pillar in the strategic development of higher education institutions worldwide. Universities are increasingly expected to demonstrate measurable progress in reducing their environmental footprint while fostering a culture of environmental responsibility among students, staff, and stakeholders. In this context, Baku Engineering University (BEU) has undertaken a series of initiatives aimed at monitoring, managing, and reducing its carbon emissions, improving energy efficiency, and integrating renewable energy sources into campus operations.

This report presents a comprehensive overview of BEU's greenhouse gas (GHG) emissions, energy consumption patterns, and renewable energy generation over the period 2024–2026. The analysis focuses on Scope 1, Scope 2, and, where available, Scope 3 emissions, alongside electricity usage and on-campus renewable energy production. The objective is to evaluate trends, identify areas of improvement, and outline future directions for institutional sustainability.

## 2. METHODOLOGICAL FRAMEWORK


The reporting framework is aligned with internationally recognized carbon accounting principles, particularly those outlined in the Greenhouse Gas Protocol. Emissions are categorized as follows:

- **Scope 1 emissions**: Direct emissions from owned or controlled sources.
- **Scope 2 emissions**: Indirect emissions from purchased electricity.
- **Scope 3 emissions**: Other indirect emissions occurring in the value chain (reported where available).

All emissions are expressed in tonnes of carbon dioxide equivalent ($tCO_2e$), ensuring comparability across reporting years. Energy consumption is measured in kilowatt-hours (kWh), and renewable energy generation reflects total on-campus production, including energy consumed, stored, or distributed.

# 3. CARBON EMISSIONS ANALYSIS

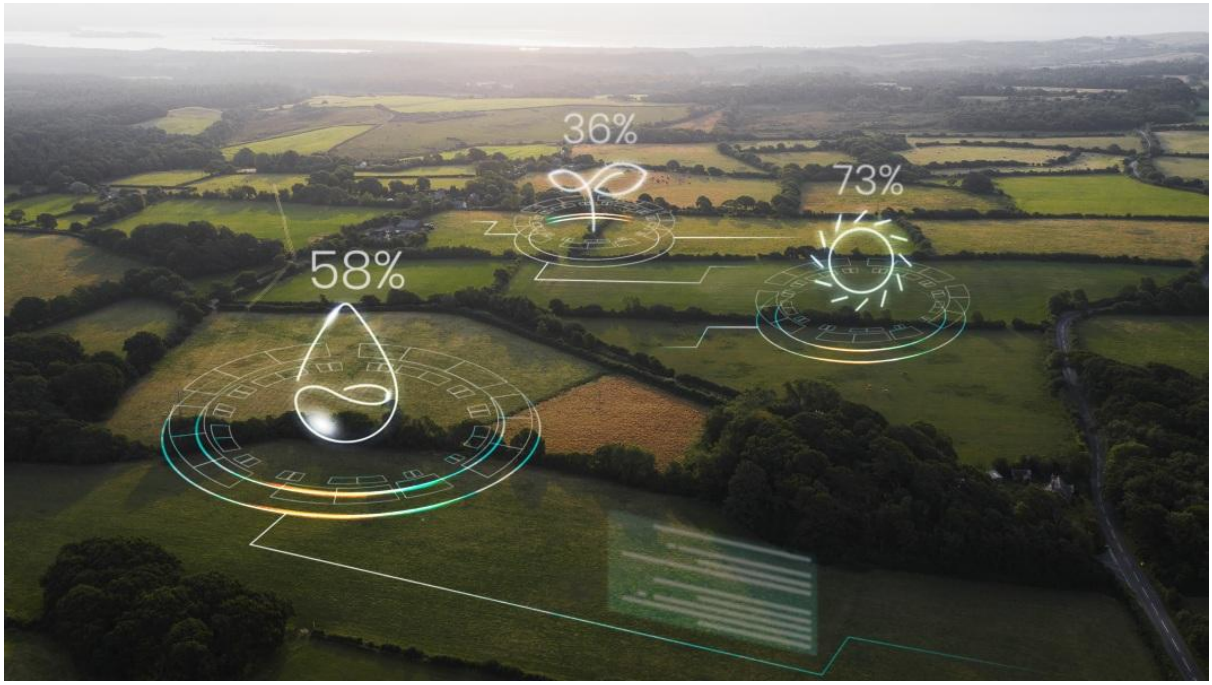
## *3.1 Scope 1 and Scope 2 Emissions*

BEU has demonstrated a consistent reduction in combined Scope 1 and Scope 2 emissions over the reporting period:

- **2024**: 1294 $tCO_2e$
- **2025**: 1037 $tCO_2e$
- **2026**: 974 $tCO_2e$

This represents an overall reduction of approximately **24.7%** from 2024 to 2026.

The downward trend indicates the effectiveness of institutional policies targeting energy efficiency, optimization of campus operations, and improved resource management. The most significant reduction occurred between 2024 and 2025, suggesting the implementation of impactful early-stage interventions, possibly including upgrades to infrastructure, improved energy monitoring systems, and behavioral changes among campus users.




The continued, albeit slower, reduction from 2025 to 2026 reflects a transition from rapid initial improvements to more incremental gains, which is typical as institutions approach greater efficiency levels.

### *3.2 Scope 3 Emissions*

Scope 3 emissions, though more complex to measure, provide insight into indirect environmental impacts:

- **2024**: 86 $tCO_2e$
- **2025**: 17 $tCO_2e$
- **2026**: 17 $tCO_2e$

A sharp decrease is observed between 2024 and 2025, followed by stabilization. This reduction may be attributed to improved data accuracy, changes in procurement practices, reduced travel-related emissions, or enhanced waste management systems.

The stabilization in 2025–2026 suggests that current mitigation measures have reached a baseline level, and further reductions will likely require more systemic interventions, such as sustainable supply chain policies or digitalization to reduce physical resource dependency.

## 4. ENERGY CONSUMPTION TRENDS

Energy consumption, particularly electricity usage, is a critical determinant of institutional carbon emissions.

### *4.1 Electricity Consumption*

The recorded electricity consumption at BEU is as follows:

- **2025**: 904,345 kWh
- **2026**: 890,779 kWh

This reflects a **1.5% reduction** in electricity consumption over one year.

While the decrease may appear modest, it is significant when considered alongside increased institutional activity or student population growth. Maintaining or reducing energy consumption under such conditions indicates improved energy efficiency.

### *4.2 Total Energy Indicators*

Additional energy-related data shows (Water):

- **2025**: 20,640
- **2026**: 20,227

Although the unit is not explicitly specified, the downward trend suggests improved resource efficiency, potentially in water usage or thermal energy systems.

## 5. RENEWABLE ENERGY GENERATION

A key component of BEU's sustainability strategy is the integration of renewable energy sources into campus operations. The data indicates a steady increase in on-campus renewable energy generation:

- **2024**: 95 kWh
- **2025**: 221 kWh
- **2026**: 338 kWh

This represents more than a **250% increase** over the three-year period.

Although the absolute values remain relatively low compared to total energy consumption, the growth rate is significant and indicative of a strong institutional commitment to renewable energy adoption. The expansion may involve solar photovoltaic installations, pilot renewable projects, or research-based energy generation initiatives.

The upward trajectory suggests that BEU is in the early stages of transitioning toward a more sustainable energy mix, with potential for substantial scaling in the coming years.

## 6. INTEGRATED ANALYSIS

A combined assessment of emissions, energy consumption, and renewable energy generation reveals several key insights:


1. **Decoupling of Emissions and Energy Use**

   Despite relatively stable energy consumption levels, carbon emissions have decreased significantly. This suggests improvements in energy sourcing, efficiency, or emission factors.

2. **Efficiency Gains**

   The reduction in electricity consumption alongside declining emissions indicates successful implementation of energy-saving technologies and practices.

3. **Emerging Renewable Capacity**

   The rapid growth in renewable energy generation, though currently limited in scale, demonstrates a clear strategic direction toward sustainability.

4. **Scope 3 Management Progress**

   The substantial reduction in Scope 3 emissions highlights progress in managing indirect environmental impacts, an area often challenging for institutions.

## 7. INSTITUTIONAL IMPLICATIONS

The observed trends have several implications for BEU's strategic development:

- **Policy Effectiveness**: The data reflects the success of sustainability policies and operational measures implemented during the reporting period.
- **Capacity Building**: Improvements are likely supported by increased awareness and engagement among staff and students.
- **Reputation Enhancement**: Demonstrated progress in sustainability strengthens BEU's position in international rankings and partnerships.
- **Data-Driven Governance**: The availability of consistent data supports evidence-based decision-making.

## 8. CHALLENGES AND LIMITATIONS

Despite the positive trends, several challenges remain:


- **Limited Renewable Scale**: Renewable energy generation remains a small fraction of total consumption.
- **Scope 3 Complexity**: Further refinement in Scope 3 data collection and reporting is needed.
- **Data Gaps**: Some indicators (e.g., 2024 electricity consumption) are not fully available, limiting longitudinal analysis.
- **Infrastructure Constraints**: Expansion of renewable energy systems may require significant capital investment.

## 9. RECOMMENDATIONS

To build on current progress, the following recommendations are proposed:

1. **Scale Renewable Energy Projects**

   Expand solar and other renewable installations to increase the share of clean energy in total consumption.

2. **Enhance Energy Efficiency Measures**

   Continue upgrading lighting, HVAC systems, and building insulation to further reduce energy demand.

3. **Strengthen Scope 3 Reporting**

   Develop comprehensive methodologies for tracking indirect emissions, including procurement and mobility.

4. **Digital Monitoring Systems**

   Implement smart energy management systems for real-time monitoring and optimization.

5. **Stakeholder Engagement**

   Promote sustainability awareness through training programs and student-led initiatives.

6. **Benchmarking and Accreditation**

   Align sustainability practices with international standards and frameworks to ensure continuous improvement.

## 10. CONCLUSION

Baku Engineering University has made measurable and consistent progress in reducing its carbon footprint and improving energy efficiency over the 2024–2026 period. The significant decline in Scope 1 and Scope 2 emissions, coupled with the rapid growth in renewable energy generation, reflects a strong institutional commitment to sustainability.

While challenges remain—particularly in scaling renewable energy and refining Scope 3 reporting—the overall trajectory is positive. Continued investment, strategic planning, and stakeholder engagement will be essential to sustaining this momentum and achieving long-term environmental goals.

BEU is well-positioned to further integrate sustainability into its core mission, contributing not only to environmental protection but also to the advancement of sustainable higher education practices globally.