CARBON EMISSIONS REPORT OF TSUOS FOR 2025

1. Institutional Profile and Reporting Framework

As the Tashkent State University of Oriental Studies (TSUOS) experiences rapid institutional expansion, integrating rigorous environmental stewardship into our growth strategy is a logistical and ethical necessity. By adopting the Greenhouse Gas (GHG) Protocol Corporate Standard, TSUOS establishes a transparent methodology for balancing academic excellence with climate responsibility. This document serves as a strategic roadmap, utilizing 2025 data to benchmark our transition toward a low-carbon campus.

The university employs an "Operational Control" approach to define its reporting boundaries. This consolidation ensures that emissions data represents facilities where TSUOS has the direct authority to implement financial and operating policies.

Organizational and Operational Boundaries

Facility Category	Included Facilities (Operational Control)	Excluded Facilities	Rationale for Exclusion
Academic & Administrative	Main Campus (Buildings A, B, V, G, D, E, Z) Campus in Str. Shahrisabz 16 Campus in Str. Amir Temur 26	Lyceum under TSUOS	Managed by an independent authority outside university operational control.
Residential	Primary University Dormitory (6,540 m^2)	New partnership-based dormitory	Managed on a partnership basis; communal fees and utilities are administered by the partner entity.

Human-to-Space Ratio

Understanding the density of our physical operations is critical for resource efficiency modeling. In the 2024-2025 academic year, the university footprint supported a total population of **6,725 individuals** (6,147 students, 338 academic staff, and 240 administrative staff) across a total physical area of **79,575 m^2**.

Campus	Total area	Building footprint area
Campus in Str. Shahrisabz 16	9948 m^2	2860 m^2
Building A	8309 m^2	11644 m^2
Building B	11080 m^2	
Building V	13200 m^2	
Buildings G, D, E	13507 m^2	
Building Z	7163 m^2	
Dormitory	6540 m^2	2350 m^2
Campus in Str. Amir Temur 26	9828 m^2	3061 m^2
Total	79 575 m^2	20 780 m^2

- **Human-to-Space Ratio: 11.83 m² per person.**

This density metric provides a baseline for evaluating the carbon intensity of our facilities. As we transition from structural boundaries to specific carbon metrics, the following sections analyze the energy and mobility impacts generated by this population.

2. Direct and Indirect Energy Impact: Scope 1 and Scope 2 Analysis

Continuous monitoring of direct combustion (Scope 1) and purchased energy (Scope 2) is a fundamental component of institutional resilience. Beyond environmental compliance, granular energy auditing allows TSUOS to mitigate operational cost volatility and identify systemic inefficiencies in facility management.

In 2025, the university's combined energy footprint reached **1204.4 tCO2e**. While electrical consumption remains a major factor, the high volume of natural gas required for heating and thermal operations represents the largest direct emission source.

2025 Energy Consumption Breakdown

Source	Category	Quantity	tCO2e
Natural Gas	Scope 1	270,681 m³	524.0
Petrol (4 Vehicles)		6,670 Litres	15.4
Purchased Electricity	Scope 2	1,689,550 kWh	665.0

Total Carbon Footprint	—	—	**1204.4**

NOTE:

Scope 1:

1. TSUOS has used 6670-litre petrol for 4 owned vehicles (15.4 tCO2e - according to https://www.icbe.com/carbondatabase/volumeconverter.asp) The university is actively transitioning its vehicle fleet to electric vehicles. By **2030**, all petrol-based cars will be replaced with electric vehicles, significantly reducing Scope 1 emissions from transportation and contributing to a lower overall carbon footprint.

2. 270 681 m3 natural gas (524 tCO2e – according to MCF of natural gas https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results) (Cubic meters were converted into MCF in https://www.kylesconverter.com/volume/cubic-meters-to-thousands-of-cubic-feet).

Scope 2:

1. 1 689 550 kWh/year (665 tCO2e – according to https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator#results)

3. Renewable Energy Mitigation: Solar Infrastructure Impact

Onsite renewable generation is the cornerstone of the university's strategy to decouple institutional growth from grid dependency. By generating clean energy at the point of consumption, TSUOS effectively lowers the net carbon intensity of its operations.

Performance metrics are synthesized from three specialized monitoring platforms (SolisCloud, SolarmanSmart, and LivolTek). The following Key Performance Indicators (KPIs) reflect the success of these systems in 2025:

- **Total Annual Generation:** 688,293 kWh/year.
- **Coal Displacement (per LivolTek):** 131.61 Mg of coal saved.
- **Reforestation Equivalency (per SolarmanSmart):** Comparable to planting 3,671 trees.
- **Current Operational Capacity (per SolisCloud):** 123.49 kW.
- **Storage Capacity (per SolisCloud):** 150 kWp.

Energy Self-Sufficiency Evaluation: In 2025, the university's total electricity demand was 2,377,843 kWh (1,689,550 kWh purchased plus 688,293 kWh generated onsite). This results in an **energy self-sufficiency rate of 28.9%**. This infrastructure provides a vital buffer against regional grid instability and serves as a precursor to the university's transition toward decentralized power management.

4. Scope 3 Emissions: Global Mobility and Academic Expansion

A fundamental tension exists between the university's mission for international academic excellence and the resulting Scope 3 emissions from business travel. As TSUOS expands its global footprint, the indirect environmental cost of air travel becomes a primary auditing focus.

The Human Mobility Surge

The 2025 reporting period recorded a significant increase in international movement across all university demographics:

- **Student Mobility:** 136 total students were sent abroad. This includes 110 students participating in field-specific internships (a **46.7% growth** over 2024) and 17 students participating in joint education programs in China.
- **Professional Development of TSUOS staff:** in total, **205** staff members of Tashkent State University of Oriental Studies (TSUOS) traveled abroad in 2025 for various academic purposes.

TSUOS Staff Foreign Travel Log (2025)

This detailed record lists staff members who traveled internationally for academic or administrative purposes during 2025.

Reason for Travel	Number of Staff
Exchange of delegations between HEIs	7
As a member of official delegation	8
Professional development, internships, training courses	108
Scientific-practical conferences, seminars, symposiums, giving lectures	68
Participation in project-related meetings	1

Conducting research, practical training	2
Bachelor's or Master's studies	1
Doctoral studies	1
Olympiads, competitions, contests, medical treatment	9

Auditing External Financial Impacts

A total of **USD 1,306,176** in partner funding was utilized to facilitate these trips and professional development courses. From an environmental auditing perspective, this high level of external funding presents a unique challenge: while it accelerates institutional growth, it often obscures the university's ability to mandate strict carbon-neutral travel policies or enforce carbon-offsetting requirements for flights funded by third-party international partners.

5. Circular Economy and Resource Management: Waste and Water Systems

TSUOS is pivoting toward a circular economy by transforming campus waste into agricultural assets and optimizing water conservation. These systems prove that resource consumption can be managed efficiently even as the user base expands.

Waste-to-Fertilizer Pipeline

The university managed waste stream of **600.6 tonnes in 2025**. Through a strategic partnership with "**MaxsusTrans**" waste was gathered from university restaurants:

1. **Collection & Sorting:** Waste is collected and re-sorted at a dedicated site near Tashkent.
2. **Processing:** Organic matter is mixed with straw, leaves, or manure and laid in rows.
3. **Technological Conversion:** Using specialized German machinery, rows are turned and dried over a six-week cycle.
4. **Output:** The process yields high-quality fertilizer, closing the loop on institutional organic waste.

2025 Water Resource Management

Total water consumption for the reporting period reached 93,730 m^3. The following table contrasts monthly usage against the university's annual threshold.

Month	Water Usage (m^3)	Annual Limit (m^3)	% of Annual Limit Used

January	5,829	200,000	2.9%
February	7,027	200,000	3.5%
March	7,785	200,000	3.9%
April	10,688	200,000	5.3%
May	9,977	200,000	5.0%
June	9,342	200,000	4.7%
July	10,101	200,000	5.1%
August	6,469	200,000	3.2%
September	7,600	200,000	3.8%
October	6,780	200,000	3.4%
November	5,212	200,000	2.6%
December	6,920	200,000	3.5%
Total	**93,730**	**200,000**	**46.9%**

Audit Interpretation: The university successfully saved **106,270 m³** of water relative to its institutional limit. This achievement is a critical indicator of facility efficiency; despite the growth in student population and the 136-student mobility programs, TSUOS has maintained its consumption well below 50% of the allocated annual capacity.

6. Conclusion and Strategic Outlook

The 2025 reporting period establishes a definitive Baseline Year for TSUOS's climate strategy. The university's total Scope 1 and Scope 2 emissions for the year reached 1,204.4 tCO2e. While natural gas and grid electricity remain the primary emissions drivers, the successful integration of onsite solar power and the establishment of circular waste systems provide a clear roadmap for future reductions.

TSUOS is positioning itself as a regional leader in sustainable education. Looking ahead, the university intends to expand the boundary of its Scope 3 reporting to include student and staff commuting and broader supply chain data. By refining our data granularity and continuing to invest in renewable infrastructure,

TSUOS remains committed to a low-carbon future, proving that institutional excellence and environmental responsibility are inseparable.