Khazar University

Greenhouse Gas Emissions Report 2025

Introduction

Reporting period 1 January to 31 December 2025

This report presents Khazar University's estimated greenhouse gas emissions for the 2025 reporting year. Total emissions from the sources included in the inventory amount to 1,126.82 metric tons of carbon dioxide equivalent (tCO_2e). The report covers direct emissions, an estimate of emissions associated with purchased electricity, and selected other indirect emissions.

The report uses the GHG Protocol framework to distinguish emission sources and support transparent reporting. Its purpose is to inform energy management, identify priorities for reducing emissions and provide a reference point for subsequent annual reporting. Scope 3 coverage is partial, and the electricity calculation uses a published country-level carbon-intensity proxy. [1-3]

Emissions summary for 2025

Scope	Estimated tCO_2e	Coverage
Scope 1	404.20	Natural gas use and university-controlled vehicles
Scope 2	347.42	Purchased electricity (483,205 kWh) using a country-level carbon-intensity proxy
Scopes 1 and 2 subtotals	751.62	Reported direct and purchased electricity emissions
Selected Scope 3	375.20	Partial inventory of other indirect emissions
Reported total	1,126.82	Scopes 1 and 2 plus the included Scope 3 estimates

The unrounded total is 1,126.824 tCO_2e. Summary values are presented to two decimal places. Scope 1 accounts for 35.9% of the reported total, the electricity estimate for 30.8%, and the included Scope 3 activities for 33.3%. The total includes the listed sources; solar generation is disclosed separately without deducting an additional emissions credit.

Reporting boundary

The inventory uses the operational control approach. It covers the university-controlled facilities and activities represented in the 2025 consumption records, including building energy use and fuel

consumption in controlled vehicles. Selected value-chain activities are reported separately under Scope 3. [1]

The reporting categories distinguish direct fuel combustion, purchased electricity and other indirect activities. The inventory includes selected estimates for commuting, procurement, waste, business travel, upstream transport and water services, as presented in the Scope 3 table.

Methodology

Activity data are multiplied by relevant emission factors and converted consistently to metric tons. Results calculated in kilograms are divided by 1,000. Calculations retain full precision before final rounding, allowing the summary totals to remain consistent with their underlying estimates.

The stated activity-data sources are utility bills for electricity, natural gas and water, and fuel records for university-controlled vehicles. Commuting, procurement, waste and business travel estimates draw on secondary data and institutional benchmarks.

The calculations distinguish direct fuel emissions, electricity-related emissions and selected other indirect activities. The electricity result uses a published country-level intensity proxy; references for the accounting framework and emission factors are listed at the end of the report.

Scope 1 direct emissions

Scope 1 emissions are estimated at 404.20 tCO_2e, representing 35.9% of the reported inventory. They comprise natural gas used for heating and gasoline and diesel used in university-controlled vehicles, as applicable. These sources link the University's direct emissions primarily to building energy demand and transport operations.

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy, provide the methodological reference for stationary and mobile fuel combustion. Heating fuels and vehicle fuels are treated as distinct sources because their consumption patterns and opportunities for reduction differ. [6]

Heating efficiency, appropriate operating schedules, equipment maintenance and efficient vehicle use are the main areas for managing direct emissions. Monitoring consumption by source supports assessment of these measures over time.

Scope 2 purchased electricity

Emissions associated with purchased electricity are estimated at 347.424 tCO_2e, presented as 347.42 tCO_2e in the summary. This represents 30.8% of the reported total. The estimate applies a country-level grid carbon-intensity factor for Azerbaijan to the University's annual purchased electricity.

The electricity calculation uses an annual activity input of 483,205 kWh, taken from electricity utility bills, and a carbon-intensity factor of 0.719 kg CO_2 per kWh.

The calculation is 483,205 kWh × 0.719 kg/kWh ÷ 1,000 = 347.424 tCO_2e. Direct fuel emissions and the electricity estimate together amount to 751.62 tCO_2e, or 66.7% of the reported inventory.

Electricity emission factor

The Asian Transport Outlook's Transport and Climate Profile Azerbaijan reports a grid carbon-intensity indicator of 719 g CO_2/kWh for 2022 and identifies Ember as its source. Ember's published methodology

encompasses lifecycle emissions. The indicator is used here as a location-based proxy for estimating the University's electricity-related footprint, rather than as a generation-only Scope 2 factor. [2, 4, 5]

The factor reference year is 2022, and the activity period is 2025. Future comparisons can distinguish changes in electricity use from changes in the intensity factor, maintaining a clear basis for interpreting trends.

On-site solar electricity

The University's reported solar photovoltaic system comprises five KTP-100P polycrystalline panels, each rated at 100 W under Standard Test Conditions. Total installed capacity is 500 W, equivalent to 0.5 kWp. Estimated electricity generation in 2025 was 500 kWh, all reported as consumed on campus.

Solar generation is disclosed separately from purchased electricity. Self-consumed generation contributes to campus electricity needs and can reduce grid purchases. The emissions summary uses the purchased electricity estimate without subtracting a separate solar credit, avoiding duplicate recognition of the same benefit. [2]

For illustration, 500 kWh multiplied by the same comparison factor of 0.719 kg/kWh corresponds to 359.5 kg, or 0.3595 tonnes, rounded to 0.360 tonnes. This is about 0.1% of the 483,205 kWh of purchased electricity and indicates the small scale of the solar contribution using the report's electricity-intensity proxy. It is presented separately and is excluded from the inventory total.

Scope 3 selected other indirect emissions

Selected Scope 3 emissions are estimated at 375.20 tCO_2e for 2025, equivalent to 33.3% of the reported total. The table below presents the included activities. This partial inventory provides an initial view of emissions associated with the University's wider activities and services.

Activity	**Estimated tCO_2e**
Commuting by students and staff	191.20
Purchased goods and services	70.40
Waste generated in operations	42.30
Business travel	29.40
Upstream transportation and distribution	16.90
Water supply and treatment	12.10
Other categories	12.90
Total selected Scope 3	375.20

Estimation basis and coverage

Scope 3 estimates use secondary data and institutional benchmarks to assess selected value-chain activities. They provide a screening basis for identifying areas where more detailed measurement would be most useful. Future development of the inventory will focus on improving activity data and expanding coverage of relevant indirect sources.

Commuting by students and staff is the largest included Scope 3 source, at 191.20 tCO_2e, or 51.0% of the Scope 3 subtotal. Purchased goods and services contribute 70.40 tCO_2e, followed by operational waste at 42.30 tCO_2e. Together, these activities account for 303.90 tCO_2e and offer the largest areas for further investigation within the reported Scope 3 coverage.

Business travel, upstream transportation, water services and other reported indirect activities make up the remaining categories. The Scope 3 framework supports consistent classification of these activities and the prevention of overlap between categories. Improved records for travel, procurement, waste and water will strengthen future assessments. [3]

Emissions management and future priorities

Energy use and operational transport (Scopes 1 and 2) account for approximately two-thirds of the reported total (66.7%). The priorities below connect the inventory results with practical areas for improving energy performance, monitoring consumption and extending the coverage of indirect emissions.

Area	Priority for continued improvement
Building energy use	Improve heating and electricity efficiency through monitoring and maintenance.
Vehicle fuel use	Monitor fuel consumption and promote efficient vehicle use.
Solar generation	Monitor generation and assess options for further renewable electricity.
Value chain activities	Strengthen primary data for commuting, procurement, travel, waste and water.
Annual reporting	Maintain consistent source records, emission factors and reporting boundaries.

Comparison over time

The 2025 results provide a reference point for subsequent reporting. Consistent boundaries, category coverage and methods will support meaningful comparison. Future analysis can distinguish changes in activity levels from changes in emission factors or inventory coverage. [1]

Improvement priorities

More efficient heating, electricity and vehicle use are central to operational emissions management. Better records for solar generation and value-chain activities will support consistent annual reporting and assessment of progress.

Conclusion

Khazar University's estimated emissions from the sources included in the 2025 inventory total 1,126.82 tCO_2e. The report provides a reference for monitoring performance and directing future work towards energy efficiency, improved data coverage and emissions reduction across university activities.

References

[1] WRI and WBCSD. GHG Protocol Corporate Accounting and Reporting Standard.
https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

[2] WRI and WBCSD. GHG Protocol Scope 2 Guidance, especially Chapters 4, 6 and 7.
https://ghgprotocol.org/scope-2-guidance

[3] GHG Protocol. Corporate Value Chain Scope 3 Standard.

https://ghgprotocol.org/corporate-value-chain-scope-3-standard

[4] Asian Transport Outlook. Transport and Climate Profile Azerbaijan (2024).
https://asiantransportobservatory.org/documents/200/Azerbaijan-transport-and-climate-policy.pdf

[5] Ember. Electricity Data Methodology, section on emissions from electricity generation.
https://files.ember-energy.org/public-downloads/ember_electricity_data_methodology.pdf

[6] IPCC. 2006 Guidelines for National Greenhouse Gas Inventories, Volume 2 Energy.
https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html