AIU

ASTANA INTERNATIONAL UNIVERSITY

GREENHOUSE GAS EMISSIONS INVENTORY REPORT

2025

ASTANA INTERNATIONAL UNIVERSITY

Baseline Year for Climate Action and Sustainable Future

SUSTAINABILITY IN ACTION

EDUCATION FOR IMPACT

TOGETHER FOR A BETTER PLANET

2026

Astana, Kazakhstan

Contents

1 Introduction

The 2025 Greenhouse Gas (GHG) Emissions Inventory Report of Astana International University LLP (hereinafter referred to as the "University") establishes 2025 as the baseline year for further analysis and emission-reduction targets. The Report was prepared in accordance with the University's approved Sustainable Development Policy and coordinated by the Centre for Foresight and Sustainable Development of Astana International University. Information from the official website (https://www.aiu.edu.kz/) was also taken into account.

Astana International University, located in the city of Astana, is one of Kazakhstan's leading higher education institutions. The University actively implements the principles of environmental responsibility and sustainable development, as reflected in its Sustainable Development Policy. As part of these efforts, a greenhouse gas emissions inventory was conducted in 2025, covering Scope 1 (direct emissions), Scope 2 (indirect emissions from purchased energy), and part of Scope 3 (municipal solid waste management).

As 2025 has been designated as the baseline year, all subsequent reports and emission-reduction strategies will be assessed against it.

2 Inventory Boundaries and Purpose

2.1 Purpose

2.1.1 Establish the University's initial (baseline) GHG emissions level and provide a basis for planning emission-reduction measures in accordance with the approved Action Plan.

2.1.2 Produce a transparent and verifiable report that will enable annual comparison of progress in sustainable development.

2.2 Inventory Boundaries

2.2.1 Organisational: all facilities within the University's structure (academic buildings, dormitories, and auxiliary units).

2.2.2 Operational:

2.2.2.1 Scope 1: emissions from the vehicle fleet (and other equipment, where applicable).

2.2.2.2 Scope 2: consumption of heat and electricity purchased from external suppliers.

2.2.2.3 Scope 3 (partial): emissions associated with municipal solid waste (MSW) management.

3 Methodology and Calculation Principles

3.1 Sources and standards.

3.1.1 GHG Protocol: classification into Scope 1, Scope 2, and Scope 3, and principles for conversion into CO_2 equivalent.

3.1.2 IPCC: global warming potentials for CH_4 and N_2O and calculation guidance.

3.1.3 National specific greenhouse gas emission factors per unit of output (List of Benchmarks in Regulated Sectors of the Economy, Order No. 260 of the Acting Minister of Ecology, Geology and Natural Resources of the Republic of Kazakhstan dated 19 July 2021).

3.2 Formulas and factors (summary).

3.2.1 Scope 1 (road transport): fuel-based method. Consumption (L) → mass (t) → CO_2 = mass × 3.17; CH_4 and N_2O are calculated using the net calorific value.

3.2.2 Scope 2: Heat: approximately 0.484 t CO_2/Gcal, plus CH_4 and N_2O.
Electricity: approximately 0.985 t CO_2/MWh, plus CH_4 and N_2O.

3.2.3 Scope 3 (MSW): waste volume → CH_4 calculation → multiplication by 25 (GWP) = CO_2 equivalent.

3.3 Principles.

3.3.1 Completeness: cover all University facilities under operational control.

3.3.2 Transparency: the Report is available for internal and external review, and all calculations can be verified.

3.3.3 Consistency: the inventory will be updated annually and compared with the 2025 baseline.

4 Process Organisation and Data Collection

The Higher School of Natural Sciences coordinates cooperation among the following units:

- Department of Administrative and Facilities Management: heat and electricity consumption, MSW removal contracts, and vehicle-fleet fuel consumption records.
- Other units: provide clarification on the operational characteristics of buildings, laboratories, and other facilities.

Data collection and initial verification are carried out by the responsible units, after which the Higher School of Natural Sciences consolidates the results. The Report is approved by the Rector of the University.

5 Emissions by Category (Scope 1, Scope 2, and Part of Scope 3)

5.1 Scope 1: Road Transport.

5.1.1 Description: University-owned vehicles (passenger cars, buses, and specialised vehicles).

5.1.2 Method: fuel consumption (litres) → mass → CO_2, CH_4, and N_2O → total in CO_2 equivalent.

5.1.3 •The contribution of road transport is generally relatively small; however, monitoring and optimising the vehicle fleet (for example, switching to hybrid or electric vehicles) can significantly reduce emissions.

5.2 Scope 2: Heat and Electricity.

5.2.1 Heat: approximately 0.484 t CO_2/Gcal; CH_4 and N_2O emissions are also included.

5.2.2 Electricity: approximately 0.985 t CO_2/MWh, plus CH_4 and N_2O. In practice, this category accounts for the largest share of the University's carbon footprint (70–80% or more).

5.3 Scope 3 (MSW)

5.3.1 Recording the volume of municipal solid waste (m^3) and calculating methane generated during decomposition.

5.3.2 The calculated CH_4 is multiplied by 25 to convert it into CO_2 equivalent.

5.3.3 Scope 3 accounting is planned to be expanded in the future to include business travel, procurement, and other categories.

6 Greenhouse Gas Emissions (tonnes)

Emission category	Emission source	CO_2 emissions (tonnes)
Scope 1 (direct emissions)	Road transport	8.89
Total Scope 1		8.89
Scope 2 (indirect emissions)	Heat energy	1,139.10
	Electricity	4,985.65
Total Scope 2		6,124.763
Scope 3 (other indirect emissions)	MSW	425.439
Total Scope 3		425.439
Total CO_2 emissions		6,808.0753

7 Conclusions and Recommendations

7.1 2025 has been designated as the baseline year, providing a basis for monitoring emission trends.

7.2 Purchased heat and electricity make the largest contribution (up to 75–80%), indicating the need for energy-efficiency measures and a transition to cleaner energy sources.

7.3 Although road transport and waste account for smaller shares, they remain important areas for optimisation, including the introduction of hybrid vehicles and the separate collection and recycling of MSW.

7.4 It is recommended to: strengthen the implementation of energy-efficient technologies in the construction and renovation of University buildings; optimise the vehicle fleet, including the use of electric vehicles, carpooling, and the reduction of inefficient trips; develop separate waste collection and organic-waste processing to reduce landfill methane emissions; and expand Scope 3 accounting to include business travel, procurement, and food services.