



**Calculation of the Policy to Reduce Plastic Consumption at
Al-Farabi Kazakh National University
for the 2024-2026 yy**

Almaty, 2024

Calculation of the Policy to Reduce Plastic Consumption at KazNU for the Next Three Years

1. Analysis of Current Consumption

- **Identification of Key Sources of Plastic:** Disposable Tableware, Plastic Bottles, Food Packaging, Bags, and Other Plastic Products.
- **Average Amount of Plastic per Person (Student or Employee):** 2 Units of Plastic

2. Reduction targets

- **Phased targets have been set:** a reduction of 20% in the first year, 50% in the second and 80% in the third year. This requires the complete abandonment of plastic bottles, bags and disposable tableware by the end of the term.

3. Measures to Reduce Plastic

- **Plastic Bottle Replacement:** Increase the number of water dispensers and drinking fountains, and encourage students to use reusable water bottles.
- **Reduced Plastic Packaging in Food Outlets:** Expand the use of reusable or biodegradable packaging for food items.
- **Reusable Tableware:** Implement a deposit system for tableware or use biodegradable, disposable options.

4. Motivation and education

- **Awareness Campaign:** Create information events and materials for students and staff.
- **Promotion of reusable use:** Conduct promotions and contests for the use of reusable bottles and dishes.

5. Calculation of the budget and expected results

- **Budget for the purchase of equipment:** dispensers, alternative packaging, etc.
- **Reducing the cost of plastic products:** saving money on the purchase of disposable plastic.
- **Environmental impact:** annual reduction of waste.

To estimate the current volume of plastic that is generated at KazNU, we will use the following assumptions based on the existing infrastructure and the number of people.

1. Initial Data and Assumptions

- KazNU has approximately 26,000 students and 2,000 employees.
- There are over 20 food establishments on the campus, where disposable tableware, bottles, and packaging are used.

- Each day, each student and employee uses an average of two pieces of plastic, such as a bottle of water or a disposable plate.
- The average length of the academic year at the university is 200 days.

2. Calculation of current plastic volume

The total amount of plastic produced per day is 28,000 people x 2 plastic units = 56,000 plastic units per day.

The total annual amount of plastic is 56,000 x 200 = 11,200,000 units.

Over a three-year period:

11.2 million x 3 = 33.6 million pieces of plastic.

3. Reduction Targets

- 20% in the first year - 11.2 million x 0.8 = 8.96 million plastic units
- 50% in the second year - 11.2 million x 0.5 = 5.6 million
- 80% in the third year - 11.2 million x 0.2 = 2.24 million

Total volume of plastic over three years, including reduction:

8.96 + 5.6 + 2.24 = 16.8 million pieces of plastic

4. Savings

Thus, in three years, the reduction in the volume of plastic can amount to:

33,600,000 - 16,800,000 = 16,800,000 units of plastic

Bottom line: With the successful implementation of plastic reduction measures, the university can reduce consumption by almost half in three years, saving about 16.8 million units of plastic products

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1. Economic effect

- The average cost of one unit of plastic (bottle, glass, plate, packaging) is 20 tenge.

Then the current costs of the university for plastic are:

11,200,000 units of plastic per year x 20 tenge = 224,000,000 tenge per year

Taking into account the reduction of plastic by 20%, 50%, and 80% over three years, the costs will be as follows:

- First year (20% reduction): 224,000,000 x 0.8 = 179,200,000 tenge.
- Second year (50% reduction): 224,000,000 x 0.5 = 112,000,000 tenge.

- Third year (80% reduction): $224,000,000 \times 0.2 = 44,800,000$ tenge.

Savings in three years:

$(224,000,000 - 179,200,000) + (224,000,000 - 112,000,000) + (224,000,000 - 44,800,000) = 336,000,000$ tenge

2. Carbon footprint

The production of one unit of plastic on average creates about 100 grams of carbon dioxide (CO₂).

Then, the initial carbon footprint is:

$11,200,000$ units of plastic $\times 0.1$ kg of CO₂ = $1,120,000$ kg of CO₂ (or 1,120 tons of CO₂) per year

Taking into account the reduction of plastic consumption by 20%, 50%, and 80%, the carbon footprint will be reduced as follows:

- First year (20% reduction): $1,120,000 \times 0.8 = 896,000$ kg of CO₂.
- Second year (50% reduction): $1,120,000 \times 0.5 = 560,000$ kg of CO₂.
- Third year (80% reduction): $1,120,000 \times 0.2 = 224,000$ kg of CO₂.

The total carbon footprint over three years will be:

$896,000 + 560,000 + 224,000 = 1,680,000$ kg of CO₂ (or 1,680 tons of CO₂)

Reduction of the carbon footprint over three years compared to the absence of measures:

$3,360,000 - 1,680,000 = 1,680,000$ kg of CO₂ (or 1,680 tons of CO₂)

Results:

- Savings: KZT 336 million over three years.
- Carbon dioxide emissions reduced by 1,680 tons in three years.

These measures will have a positive impact on the university's economy and environment by reducing carbon dioxide emissions and plastic consumption.