

Baku State University



Energy Efficiency Plan

SUSTAINABLE DEVELOPMENT GOALS





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Energy Efficiency Plan (2023–2028)

Vision:



To emerge as a regionally and internationally recognized leader in sustainable campus development, where energy efficiency, low-carbon infrastructure, and climate-resilient systems are fully embedded into institutional strategy, governance, and daily operations. Baku State University (hereafter-BSU) envisions a future in which its campus functions as a living laboratory for sustainable innovation- demonstrating best practices in energy management, renewable integration, and environmental stewardship-while actively contributing to Azerbaijan’s long-term objective of achieving carbon neutrality by 2050 and supporting global climate agendas.



Mission:

The mission of BSU’s Energy Efficiency Plan is to establish a sustainable, energy-conscious campus by optimizing resource use, reducing overall energy consumption, and integrating innovative, environmentally responsible technologies into university operations.

The university aims to foster a culture of energy awareness among students, faculty, and staff, encouraging responsible behavior and active participation in energy-saving initiatives. Through strategic planning, infrastructure modernization, and continuous monitoring, BSU seeks to minimize its environmental impact, contribute to national energy efficiency targets, and support global sustainability efforts.



The establishment of a sustainable and environmentally responsible campus infrastructure.

The integration of innovative and renewable energy solutions into university operations.

Contribution to national energy efficiency targets and global climate goals.

Values

BSU upholds sustainability by committing to long-term environmental stewardship and efficient resource management across all university operations. Innovation drives the university to adopt advanced technologies and best practices that enhance energy efficiency.

Collaboration is fostered among students, faculty, and staff to ensure collective responsibility for sustainable energy practices. Transparency is maintained through consistent monitoring, reporting, and communication of energy usage and efficiency initiatives. The university embraces responsibility by promoting ethical and accountable energy consumption aligned with national and global climate goals.



Strategic Goals

BSU aims to achieve a significant reduction in total energy consumption across all campus facilities by 2028. The university is committed to upgrading infrastructure to maximize building



performance and minimize energy waste. Renewable energy sources such as solar and wind are integrated into campus operations to support sustainable practices. Educational initiatives are implemented to raise awareness among the university community regarding energy conservation. All efforts are aligned with Azerbaijan's national objectives for carbon neutrality and climate action.



Policy Framework and Governance

Lead Body: BSU Climate Action and Sustainability Committee
Policy Basis:

- BSU Climate Action Plan (2023–2030)
- National Energy Efficiency Law of Azerbaijan (2023)
- State Program on Energy Efficiency and Use of Renewable Energy Sources (2021–2027)

Strategic Objective:

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To ensure that all BSU facilities and operations meet or exceed national energy efficiency standards, particularly by implementing continuous monitoring, energy audits, and adoption of renewable technologies.

Governance Mechanisms:

- Creation of a BSU Energy Management Office, responsible for implementing and reviewing energy efficiency projects.
- Integration of energy management into procurement policies and facility maintenance contracts.
- Annual sustainability reporting to the Ministry of Science and Education and the Ministry of Energy of Azerbaijan.



Key Action Areas and Measures

A. Building Energy Efficiency



BSU recognizes that the majority of its energy use and emissions come from buildings. Therefore, improving the energy performance of university buildings is a top priority.

Target	Action	Timeline	Responsible Unit
Reduce building energy use by 20%	Conduct detailed energy audits for all main campus facilities; develop energy passports; implement smart energy monitoring systems	2023–2025	Facilities Department
Upgrade lighting systems	Replace fluorescent and halogen lights with LED systems across all academic, administrative, and dormitory buildings	2023–2026	Procurement & Infrastructure Department
Improve insulation and building envelope	Add high-efficiency roof, wall, and window insulation to lecture halls, laboratories, and libraries	2024–2027	Engineering Department
Enhance HVAC systems	Install automated, energy-efficient heating, ventilation, and air conditioning systems with motion sensors and smart thermostats	2025–2028	Facilities & Climate Research Center
Introduce green roofs and passive ventilation	Pilot green roof systems to reduce heat loss and improve air quality	2026–2028	Innovation and Research Unit

B. Renewable Energy Integration



BSU is gradually shifting toward renewable energy sources to diversify its energy mix and reduce dependency on fossil fuels.

Target	Action	Timeline	Responsible Unit
Achieve 15% renewable energy generation by 2028	Install solar photovoltaic (PV) panels on main administrative buildings and selected academic facilities	2023–2026	Renewable Energy Laboratory
Expand the “EcoEnergy Station” project	Enhance solar-powered charging infrastructure for e-bikes, e-scooters, and student electronics; connect system to campus microgrid	2025–2027	Sustainability Office
Launch Green Innovation Pilot	Develop pilot projects for geothermal heating and hybrid solar-wind microgrids in collaboration with the Ministry of Energy	2026–2028	Climate Research Center
Explore energy storage solutions	Integrate battery storage systems to stabilize renewable energy supply	2027–2028	Renewable Energy Lab & Engineering Faculty

Concrete Example:

The BSU EcoEnergy Station, launched in partnership with the Ministry of Ecology and Natural Resources, now provides renewable power for campus mobility and small devices, reducing CO₂ emissions and promoting clean energy literacy among students.



Monitoring, Reporting, and Evaluation

To ensure transparency and accountability, BSU will establish a comprehensive monitoring and evaluation framework for all energy efficiency initiatives.

- Baseline Year: 2021
- **Key Performance Indicators (KPIs):**
 - Total annual energy consumption (kWh)
 - CO₂-equivalent emissions (tonnes)
 - Share of renewable energy (%)
 - Cost savings achieved through efficiency improvements
 - Energy performance certificates of renovated buildings

Annual Review Process:

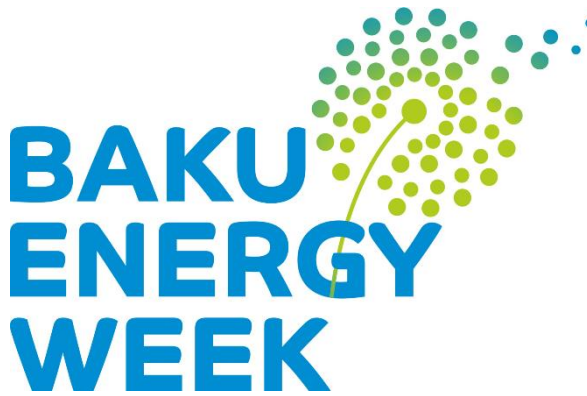
Each year, the BSU Sustainability Office will compile data from energy meters, facility reports, and departmental audits. Results will be published in the BSU Annual Sustainability Report and shared with relevant ministries and the public through the [SDG.bsu.edu.az](http://sdg.bsu.edu.az) platform.

External Verification:

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Independent verification will be conducted every two years by the Ministry of Energy of Azerbaijan and the State Agency for Renewable Energy.



Achievements to Date (as of 2023)

- Installation of solar-powered EcoEnergy Station on the main campus.
- Completion of energy-efficient LED retrofitting in administrative and classroom buildings, reducing lighting energy use by 30%.
- 15% reduction in campus-wide CO₂ emissions since 2021.
- Ongoing energy management training programs for facilities staff and students.
- Introduction of “Sustainable Campus Week”, promoting awareness of energy-saving behaviors.

Expected Outcomes by 2028

By 2028, BSU aims to have achieved the following measurable outcomes:

- 25% reduction in total energy consumption across all facilities.
- 15% of campus energy supplied by renewable sources.
- 100% of buildings equipped with energy efficiency certifications compliant with national standards.
- Integration of smart energy systems for real-time monitoring and optimization.
- Strengthened student and faculty participation in sustainability initiatives and research.



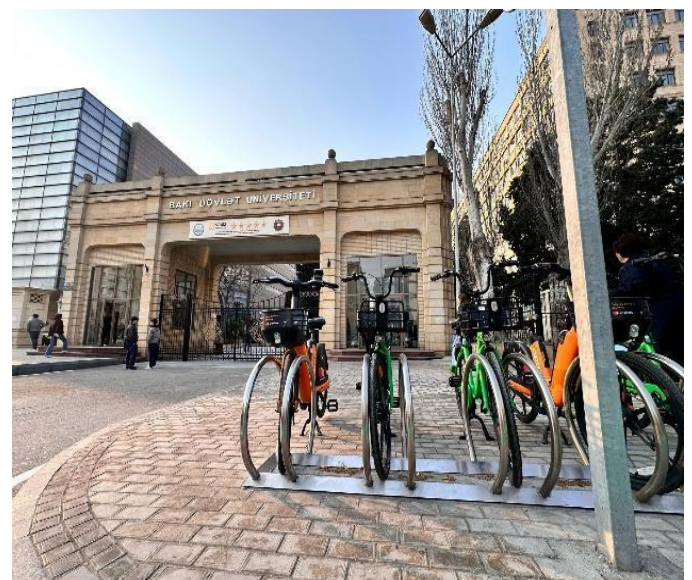
Partnerships and Collaboration

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BSU actively collaborates with national and international partners to accelerate energy transformation:

- **Ministry of Energy of Azerbaijan:** technical support and compliance verification.
- **Ministry of Ecology and Natural Resources:** collaboration on carbon management and renewable integration.
- **UNDP Azerbaijan:** partnership on campus sustainability programs.
- **Azerenerji and local municipalities:** development of pilot clean energy systems and grid integration projects.





Infrastructure

The BSU Energy Efficiency Plan considers infrastructure modernization as one of the main priorities, and it takes into account that the main part of energy consumption is related to buildings.

The university aims to create a smart and integrated energy infrastructure. In this context, old lighting systems are replaced with LED technology, which significantly reduces energy consumption.

High-quality insulation materials are used to improve the thermal properties of buildings. This reduces heat losses and increases energy efficiency.

At the same time, HVAC systems are being modernized. Systems equipped with smart thermostats and sensors automatically regulate energy use.



In addition, renewable energy infrastructure is being developed: solar panels, energy storage systems and hybrid energy projects are being implemented.

At the same time, innovative solutions such as green roofs, passive ventilation and ecological building materials not only increase energy efficiency, but also improve the quality of the campus environment.



Long-Term Vision Beyond 2028

Following the implementation of this plan, BSU will continue to expand its sustainability leadership role by:

- Achieving carbon neutrality by 2035 for all university operations.
- Establishing a Center for Sustainable Energy and Smart Buildings for research and innovation.
- Integrating climate literacy and energy efficiency into all academic programs.



GLOSSARY

Carbon Footprint

The total amount of greenhouse gases emitted directly or indirectly by an institution or activity.

Renewable Energy

Energy derived from natural sources that are replenished continuously, such as solar, wind, and hydro power.

Green Building

A building designed, constructed, and operated to reduce environmental impact and improve energy efficiency.



Climate Change Mitigation

Efforts to reduce or prevent the emission of greenhouse gases.

Energy Saving Measures

Actions or technologies implemented to reduce energy consumption without affecting performance.