Azerbaijan TECHNICAL University

7 AFFORDABLE AND CLEAN ENERGY

Report on Sustainable Development Goal 7

Affordable and Clean Energy

2025



Foreword

This report presents Azerbaijan Technical University's (AzTU) efforts and achievements in promoting clean and affordable energy in 2025, in alignment with the United Nations Sustainable Development Goal 7 (SDG 7).

Building upon the progress of 2023 and 2024, the university continued to expand energy efficiency measures, integrate renewable energy solutions across its infrastructure, and strengthen sustainability education and research.

Through cooperation with national and international partners—including the Ministry of Energy, the State Agency on Renewable Energy Sources, and universities in Germany, Türkiye, and Malaysia—AzTU has strengthened its commitment to sustainable energy innovation and technology transfer.

Introduction

AzTU's commitment to SDG 7 supports the national "Clean Environment and Green Growth" strategy and the global shift toward a low-carbon economy.

The university's Department of Energy Efficiency and Green Energy Technologies coordinates energy audits, renewable energy research, and capacity-building initiatives.

In 2025, AzTU deepened its efforts by integrating smart energy management systems into campus buildings, introducing student-led solar projects, and expanding training in sustainable energy technologies. These initiatives strengthen the connection between academic learning, applied research, and environmental responsibility.

The Quality Assurance Department monitors all university activities under the SDG framework to ensure transparency, efficiency, and measurable outcomes.

References

National Information Portal on Sustainable Development Goals of the Republic of Azerbaijan AzTU Sustainability

AzTU SDG 7 Report / November 2023

AzTU SDG 7 Report 2024

A Meeting with UN Experts on Energy Efficiency Eurasia Universities Summit 2025

GreenTech II Startup Competition

Collaboration with Malatya Turgut Özal University Collaboration with Holon Institute of Technology

SDG 7 keywords - Affordable and clean energy			
Affordable and Clean Energy	Renewable Energy	Energy Efficiency	Sustainable Energy Systems
Solar Energy	Wind Energy	Solar Photovoltaic Systems	Smart Energy Management
Energy Consumption Reduction	Carbon Emission Reduction	Low-Carbon Technologies	Green Energy Research
Sustainable Power Systems	Smart Grids	Hydrogen Technologies	Energy Storage Technologies
AI in Energy Systems	AI-Based Grid Optimization	Renewable Energy Integration	Energy-Efficient Buildings
LED Lighting Technologies	Smart Energy Monitoring Systems	Clean Energy Innovation	Sustainable Energy Education
Green Technology Entrepreneurship	Energy Research and Development	Renewable Energy Infrastructure	Carbon Management
Clean Energy Technology Transfer	Sustainable Energy Partnerships	Micro-Solar Charging Stations	Climate-Friendly Energy Solutions

SDG 7 Targets

- **Increase Energy Efficiency in University Buildings:** Reduce energy consumption in university buildings by 5-10% over the next 5 years through the installation of energy-efficient technologies (LED lighting, reinforced insulation, solar water heaters, and automatic control systems).
- **Expand Renewable Energy Infrastructure:** Increase the share of renewable energy in AzTU's energy mix, aiming for 20% of the university's energy consumption to be sourced from solar and wind energy by 2030.
- **Promote Carbon Reduction and Waste Management:** Achieve a 10% reduction in carbon emissions from campus activities over the next 5 years.
- **Enhance Green Energy Research and Innovation:** Position AzTU as a leader in green energy research and innovation by supporting at least 10 student and faculty-led projects annually focused on sustainable energy, energy efficiency, and carbon management.
- **Strengthen Sustainability Education and Awareness:** Increase awareness of SDG 7 across the AzTU community, with at least 75% of students and staff engaged in sustainability-focused initiatives by 2026.
- **Foster Digital Transformation to Optimize Resource Use**: Achieve a 15% reduction in overall resource consumption (e.g., paper, water, and energy) by 2027 through the implementation of digital tools and systems that streamline operations.
- **Strengthen Community and Stakeholder Engagement on Clean Energy:** Engage at least 10 local and regional stakeholders in discussions and partnerships on renewable energy and energy efficiency initiatives by 2025.
- **Reduce Single-Use Plastics and Carbon-Intensive Products:** Eliminate 80% of single-use plastics from the university campus by 2025 and reduce reliance on carbon-intensive materials and products.

Statistics and Their Indicators

Indicator	2023	2024	2025	Change (2023–2025)
Total energy consumption (MWh/year)	7,100	6,500	**5,720**	−19 %
Share of renewable energy in total use (%)	12	16	**23**	+11 pp
CO_2 emissions (tons/year)	960	890	**730**	−24 %
Number of energy-efficiency project implemented	8	11	**15**	+88 %
Energy-related research publications	5	8	**10**	+100 %
Students involved in energy project	520	640	**850**	+63 %
Partner institutions (SDG 7 collaboration)	5	8	**12**	+140 %
Buildings equipped with smart monitoring (%)	30	45	**60**	+30 pp

Positive impact on other SDGs

SDG 4 (Quality Education): AzTU's educational initiatives enhance knowledge and skills in energy and sustainability, contributing to quality education. The updated *Renewable Energy Engineering* curriculum, with courses such as Energy Economics, Smart Grids, and Sustainable Power Systems, strengthens students' technical literacy. More than 850 students participated in seminars and hackathons, promoting hands-on learning and employability in the green economy.

SDG 8 – Decent Work and Economic Growth: Training programs like *"Databricks Engineer Seminar"* and *"AI in Energy Systems"* build digital and energy-sector skills, increasing graduates' competitiveness in emerging green job markets. Entrepreneurship initiatives such as the *"GreenTech II Startup Competition"* foster clean-tech startups, while industry partnerships with Baykar *Technological Azerbaijan* and *Azerenerji OJSC* strengthen students' practical engineering experience and support sustainable economic growth.

SDG 9 – Industry, Innovation, and Infrastructure: AzTU's initiatives in energy-efficient infrastructure and green energy technologies are fostering innovation in sustainable building practices and creating resilient infrastructure. Through projects like the *Solar PV Project*, AzTU is showcasing cutting-edge renewable energy solutions that contribute to the development of green industry and sustainable construction practices.

SDG 11 – Sustainable Cities and Communities: AzTU's solar-powered and energy-efficient campus serves as a model for urban sustainability. Pilot micro-solar charging stations designed by the *Student Energy Club* promote decentralized clean energy access in local communities, while the university's renewable energy roadmap contributes data and best practices to national sustainability policies.

SDG 12 – Responsible Consumption and Production: LED lighting upgrades and the *Smart Energy Monitoring System* have reduced electricity use by 12 %, promoting responsible resource consumption. Awareness programs and student engagement activities further encourage sustainable behavior across the campus community.

SDG 13 – Climate Action: By implementing solar PV systems and LED technology, AzTU has reduced annual CO_2 emissions by 38 tons. Energy- and climate-focused courses, research, and international conferences strengthen climate education and reflect AzTU's commitment to clean energy and climate resilience.

SDG 17 – Partnerships for the Goals: Collaborations with Malatya Turgut Özal University, Holon Institute of Technology, and Namangan State Technical University have expanded international research and education partnerships. Engagements with UN experts and events like the Eurasia Universities Summit on Sustainable Energy and Technology reinforce AzTU's active role in advancing global SDG partnerships.

Current situation

1. Renewable Energy Infrastructure

- In 2025, AzTU installed solar photovoltaic **panels (capacity 210 kW)** on campus rooftops, covering **23 % of total electricity demand** for educational buildings.
- The "Smart Energy Monitoring System" reduced annual energy consumption by **12 %** compared to 2024.
- New **LED-based lighting replaced** 90 % of fluorescent systems, cutting emissions **by 38 tons CO_2/year.**

(reference: A Meeting with UN Experts)

2. Research and Academic Innovation

- AzTU researchers completed six energy-related R&D projects focusing on **hydrogen technologies**, **AI-based grid optimization**, and **energy storage**.
- The joint *"Energy 4 Future"* project with partners in Germany and Israel explored hybrid solar-wind models for off-grid laboratories.
- Publications on renewable-energy integration increased by 25 % in 2025.
- The university hosted training sessions such as "Artificial Intelligence in Energy Systems", which strengthened energy analytics skills, and the "Databricks Engineer Seminar for AzTU Students", which developed data engineering skills.

3. Education and Student Engagement

- The updated Renewable Energy Engineering curriculum now includes new courses on **Energy Economics, Smart Grids,** and **Sustainable Power Systems.**
- Over 850 students participated in 2025 energy-related workshops and hackathons
- The Student Energy Club launched pilot projects designing micro-solar charging stations on campus.
- At the "GreenTech II Startup and Green Technologies Competition", AzTU students won 2nd place in the Green Transport category with the "City Mobility" micromobility project.

4. Partnerships and Community Impact

- AzTU strengthened industry cooperation with Baykar Technological Azerbaijan, focused on engineering internships and applied projects, and with Azerenerji OJSC on renewable-energy research.
- International cooperation was expanded through agreements with **Malatya Turgut Özal University, Holon Institute of Technology,** and **Namangan State Technical University.**
- In 2025, AzTU hosted the **Eurasia Universities Summit** on Sustainable Energy and Technology, attended by 150 delegates from 10 countries.

(related: AzTU showcased at the Eurasia Universities Summit)

Future goals

1. **Expand Renewable Energy Capacity:** Install additional 300 kW of solar capacity and pilot a wind micro-turbine system by 2027.
2. **Establish a Clean Energy Research Center:** Create an interdisciplinary hub for advanced energy modeling, hydrogen storage, and sustainable design.
3. **Integrate Smart-Grid Training:** Introduce a Smart-Grid Simulation Laboratory for Electrical Engineering students.
4. **Achieve Carbon Neutrality:** Target 50 % reduction in campus emissions by 2030 via renewables and efficiency measures.
5. **Community Outreach:** Organize annual "Clean Energy Days" and renewable-energy workshops for high-school students nationwide.

Conclusion

In 2025, Azerbaijan Technical University strengthened its commitment to advancing affordable and clean energy solutions through infrastructure modernization, interdisciplinary research, and student participation.

AzTU's initiatives reflect its strong commitment to SDG 7 targets—ensuring access to reliable, sustainable, and modern energy for all—and contribute significantly to Azerbaijan's national sustainable-energy transition.