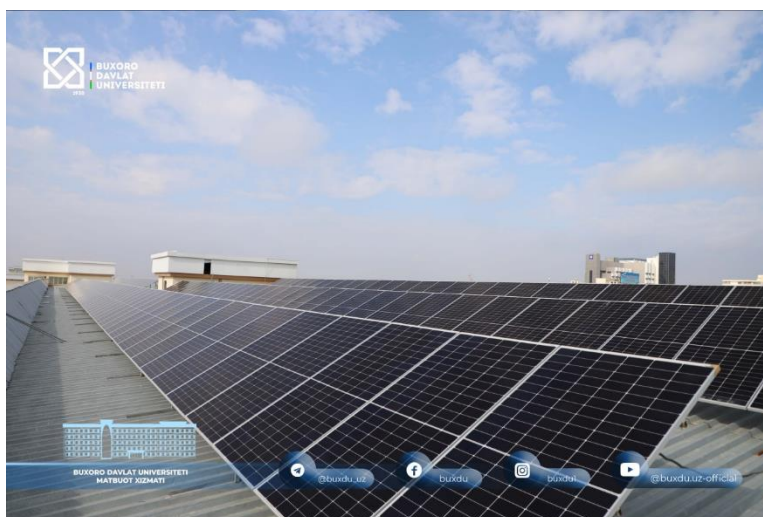




Report
on
The Sustainable Development Goal 7

7 AFFORDABLE AND
CLEAN ENERGY





The use of renewable energy

The use of sustainable energy on campus is one of the primary goals at Bukhara State University and considering the climate of the Bukhara region, which provides more than 300 days of sunlight annually, solar energy is not only capable of supplying the university with clean and affordable energy but also being connected to the grid may provide electricity beyond the campus. The state program initiated by the President of the Republic of Uzbekistan on the acceleration of the introduction of

renewable and efficient sources of energy across the country, and the perseverance of the university management, Bukhara State University has nearly transferred to renewable energy supply in 2023. The project of implementation of the use of renewable energy was monitored with scrutiny by the Ministry of Higher Education, Science and Innovations.



To date, 1965 units of solar panels have been installed on Bukhara State University campus buildings and electricity production with a capacity of 1085 kW/h has begun, exceeding the initial goal of 1000 kW/h. As a result of the measures taken, the established plan was fulfilled by 120%. The university allocated 11 billion UZS (980 000 USD based on the rate of the Central Bank of the

Stage	Building with solar panels	The energy produced per hour	Number of solar panels
1	Main building (main campus)	170 KWT/H	792
	2 nd and 3 rd buildings (main campus)	270 KWT/H	
2	Dormitory blocks (main campus)	565 KWT/H	1028
3	Agronomy faculty main building (agronomy and biotechnology campus)	80 KWT/H	145
	Total:	1085 KWT/H	1965 panels

Republic of Uzbekistan on 31 December 2022). The solar panel installation project was divided into three stages. Over three stages 10 buildings on two university campuses had solar panels

installed on the roof. The university is estimated to generate electricity for 1872 million UZS (1 667 706 USD based on the rate of the Central Bank of the Republic of Uzbekistan on 31 December 2022), reaching break-even in less than 6 years. The installation of the solar panels was finished and energy generation was launched in February 2023. Since then, Bukhara State University has had 1965 solar panels installed, producing 1085 kW/h electricity in total. Bukhara State University is estimated to produce and supply itself with 5200 kW/h daily, 156 000 kW/h monthly, and 1820 mW/h electricity annually. For its 8-month operation period starting in February 2023, the solar panels produced 1140 mW/h electricity which is 68.9% of electricity usage over the last 12 months.

The implementation of the “Green Energy Zone”

At Bukhara State University, under the leadership of the rector, Professor Obidjon Khamidov, a specially designated team was formed with the participation of experts on the organization of the "Green Energy Zone" at the university. First of all, at the main entrance to the university's main building, an autonomous solar photoelectric power station with a capacity of 900 watts was installed. This solar power station continuously supplies electricity to the pedestrian traffic light, gate barrier and 4 units of 100-watt floodlights. The solar power station was financed by the university's innovative development fund for 29 million UZS. The next step towards implementing the project was 50 units of 150-watt solar-powered autonomous street lights to illuminate the university in campus pathways for a total cost of 24 million UZS. The work on the organisation of the green zone continued, and 10 units of 200-litre solar water heating devices were installed to provide hot water in the student dormitory, the total volume is 2200 litres. The university allocated 105 million UZS for the purchase and installation.

The Net-zero plan

Bukhara State University is committed to leading the way towards a sustainable future by implementing a comprehensive net-zero plan. This plan outlines the actions and interim targets the university will undertake to achieve carbon neutrality and significantly reduce its environmental impact.

By 2045, Bukhara State University envisions itself as a carbon-neutral institution, where all emissions are balanced by equivalent carbon removal, energy efficiency and sustainable practices. The university will be recognized as a sustainability leader within the higher education community, inspiring students, staff and the broader community to become environmentally conscious global citizens.

Actions and Interim Targets:

1. Energy Efficiency and Renewable Energy:

Interim Target 1 (2026): Install solar panels on university buildings to generate 50% of the total energy demand on campus.

Interim Target 2 (2028): Increase energy efficiency by 20% through building retrofitting and technology upgrades.

Interim Target 3 (2030): Implement smart energy management systems to optimise energy consumption and reduce wastage.

2. Sustainable Transportation:

Interim Target 1 (2026): Increase the use of electric and hybrid vehicles in the university's transport fleet to 20%.

Interim Target 2 (2026): Encourage the use of bicycles and promote public transportation among students and staff, aiming to reduce single-occupancy vehicle trips by 30%.

3. Waste Reduction and Recycling:

Interim Target 1 (2026): Implement a comprehensive waste management system that diverts 30% of waste from landfills through recycling and composting initiatives.

Interim Target 2 (2026): Promote the use of reusable water bottles, containers, and other sustainable practices to reduce single-use plastic consumption by 50%.

Interim Target 3 (2025): Establish partnerships with local recycling facilities and organisations to maximise recycling efficiency and explore innovative waste reduction technologies.

4. Carbon Offset and Removal:

Interim Target 1 (2030): Invest in verified carbon offset projects to offset 10% of the university's remaining emissions that cannot be reduced internally.

Interim Target 2 (2028): Implement afforestation and reforestation projects on campus and in nearby areas to sequester CO₂.

Interim Target 3 (2030): Collaborate with research departments to explore and support cutting-edge carbon removal technologies.

5. Curriculum Integration and Awareness:

Interim Target 1 (2026): Integrate sustainability and climate change topics into 20% of the university's academic programs across disciplines.

Interim Target 2 (2025): Organise sustainability workshops, seminars, and awareness campaigns to engage students, staff, and the local community in sustainable practices.

Interim Target 3 (2025): Establish a sustainability centre to promote research, innovation, and outreach in environmental sustainability.

6. Engagement:

Interim Target 1 (2024): Engage with faculty, staff, students, and the local community to gather feedback and ideas for sustainable initiatives.

Interim Target 2 (2025): Establish a sustainability committee comprising representatives from different departments to guide and oversee sustainability efforts.

Interim Target 3 (2026): Foster partnerships with local businesses, government agencies, and NGOs to leverage resources and expertise for sustainability projects.

Monitoring and Reporting: The university will regularly monitor progress towards achieving interim targets and the net-zero goal. Annual sustainability reports will be published to transparently communicate results, challenges, and future action plans.

By following this net-zero plan with clear actions and interim targets, Bukhara State University aims to lead by example and contribute significantly to global efforts in combating climate change and securing a sustainable future for all.



So far, Bukhara State University has put several efforts to upgrade existing buildings to higher energy efficiency. The air conditioning system was upgraded to air-conditioning with inverters, the lightning has been replaced with LED bulbs as well and computers were replaced by energy-saving models, on campus sidewalks were equipped with motion-sensitive street lamps with solar batteries reducing the energy consumed. Also, the university continues on campus campaign to raise awareness of renewable energy.

Bukhara State University conducts measurement of the total carbon footprint using methodology developed by the University of Indonesia. A dedicated team measures carbon footprint in metric tons by taking into account metrics of annual electricity usage, the number of shuttle buses travelling inside the campus, number of cars, and motorcycles entering the campus. Detailed calculations are provided below:

- **CO₂ (electricity)**

$$=(\text{electricity usage per year (kWh)})/1000 \times 0,84$$

$$=(1,652,540 \text{ kWh})/1000 \times 0,84$$

$$= 1,388.133 \text{ metric tons}$$

- **CO2 (bus)**

= (number of shuttle bus in your university × total trips for shuttle bus service each day × approximate travel distance of vehicle each day inside campus only (KM) × 240) / 100 × 0,01
= (0 × 0 × 5 × 240) / 100 × 0,01
= 0 metric tons

- **CO2 (cars)**

= (number of cars entering your university × 2 × approximate travel distance of vehicle each day inside campus only (KM) × 240) / 100 × 0,02
= (140 × 2 × 0.1 × 240) / 100 × 0,02
= 1.344 metric tons

- **CO2 (motorcycle)**

= (number of motorcycle entering your university × 2 × approximate travel distance of vehicle each day inside campus only (KM) × 240) / 100 × 0,01
= (0 × 2 × 5 × 240) / 100 × 0,01
= 0 metric tons

- **CO2 (total)**

= 1,388.133 + 0 + 1.344 + 0
= 1,389.477 metric tons



The total carbon footprint in 2022 was 1,389.477 metric tons

The university extends its commitment to reducing carbon dioxide emissions through several university programs. In campus tree planting program involves teachers and students participating in seedling planting in the vegetative areas in autumn every year. Volunteers among teachers and students can participate in the program to contribute to the green landscaping of the campus. Besides that, the “Green Commuter Initiative” encourages the university population to use bicycles to commute to work and study places. Once a week the university population including academics, administration and students join the initiative and arrive at the university by cycling, once classes are finished followers move towards the next

such as sights and parks.

Raising awareness of renewable energy sources is one of the main steps towards building sustainable communities. The university believes that people must understand the importance of sustainable energy and its crucial role in building future societies not within the campus only but in the city as well. The university has been promoting renewable energy efficiency through the “Green Energy Area” installed in front of the university's main campus entrance.

