AZERBAIJAN TECHNICAL UNIVERSITY

Climate Action Plan

A roadmap for advancing climate education, research and technological solutions that reduce environmental impact.

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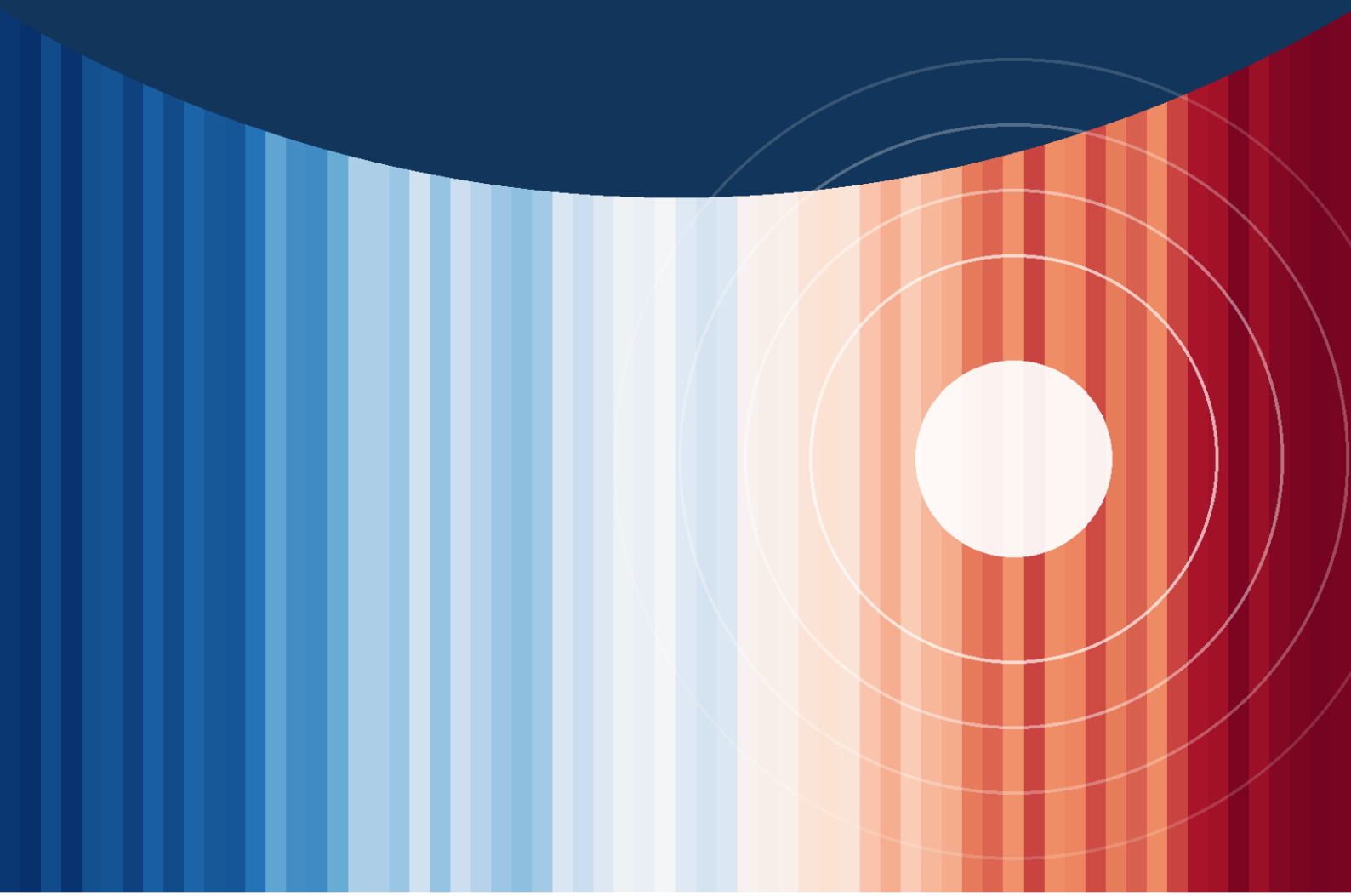

SDG 13 Climate Action · Net zero by 2050

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1 Overview of the Present Circumstances

Introduction

Earth's climate has always changed naturally, but it is now changing far faster than at any time in the past. The main cause is human activity: burning fossil fuels such as coal, oil, and gas, along with agriculture and land use change, releases greenhouse gases (GHGs) faster than natural systems can absorb them, so more heat is trapped in the atmosphere. This warming is occurring too quickly for many ecosystems and species to adapt, making climate change a serious global challenge.

In response, Azerbaijan Technical University (AzTU) has developed this Climate Action Plan. It sets out the university's roadmap for advancing climate education, research, and technological solutions that reduce environmental impact, particularly in the oil, chemical, and water sectors.

AzTU has a long tradition of leadership in science, engineering, and technology. Through this plan, it aims to continue that tradition by training skilled specialists and developing research and technologies that contribute to a more sustainable future.

Vision and Mission

VISION

AzTU aims to be a leading center for climate education and research in Azerbaijan, preparing informed and responsible specialists who develop innovative solutions for a sustainable and resilient future.

MISSION

Our mission is to contribute to climate change mitigation and adaptation by reducing environmental pollution and advancing environmentally friendly technologies. Through education, research, and collaboration, we aim to:

- Provide accessible, science-based education on climate change and sustainability;
- Equip students with practical knowledge and tools to reduce environmental impact;
- Develop and promote technologies that address pollution, water scarcity, and soil contamination;
- Inspire innovation and leadership among students and faculty in pursuit of a sustainable future;
- Raise awareness of the causes and consequences of climate change among students, faculty, and the wider community.

By integrating sustainability into teaching and research, AzTU strives to lead by example and to contribute to local and global climate solutions.

Current Initiatives

AzTU participates in regional and international networks that promote sustainability and higher education, including the Eurasian Universities Union (EURAS), the Eurasian Universities Association (EUA), the Association of State Universities of Caspian Region Countries, the Black Sea Universities Network, the CIS International Innovation Centre for Nanotechnology, and EIFL (Electronic Information for Libraries). These partnerships support collaboration and knowledge-sharing with universities and organizations worldwide.

To reduce its environmental impact, the university has introduced energy efficiency measures, including cleaner heating systems, energy-efficient double-glazed windows, and low-carbon fuels. It has also expanded renewable energy production, introduced efficient waste management technologies, and supported the expansion of forest areas. AzTU has installed two wind turbines and plans to add solar panels.

AzTU also supports national initiatives to develop "smart" cities and villages and green energy projects in the liberated territories, contributing its scientific expertise and research capabilities. Sustainability guides the university's activities at both the local and global levels.

2 Climate Change Plan/Policy of AzTU

Purpose

The Climate Action Plan of Azerbaijan Technical University (hereinafter “the Plan”) is based on the decisions of the United Nations Framework Convention on Climate Change (UNFCCC) adopted at the COP 28 (2023) and COP 29 (2024) conferences, the Basic Regulations of the Forest Development Service under the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan (Baku, 2020), and the Decree of the President of the Republic of Azerbaijan, Ilham Aliyev, dated February 2, 2021, on the “Azerbaijan 2030: National Priorities for Socio-Economic Development.”

The purpose of the Plan is to reduce activities at Azerbaijan Technical University (AzTU) that contribute to climate change, environmental pollution, and atmospheric contamination by greenhouse gases and other harmful emissions, and to strengthen climate education, research, and technological solutions.

AzTU is committed to maintaining a teaching and working environment that prevents or minimizes activities contributing to climate change and environmental pollution. It will take appropriate measures to address climate change in line with international agreements and decisions and with the national legislation of the Republic of Azerbaijan.

Causes of Climate Change

Climate change is driven mainly by rising concentrations of greenhouse gases in the atmosphere, which strengthen the greenhouse effect. The main causes are the burning of fossil fuels (coal, oil, and gas), deforestation and land use change, and agriculture. These activities increase emissions of carbon dioxide (CO2), methane, and other gases, including freons (CFCs), which are also potent greenhouse gases. Some aerosols, such as black carbon, also contribute to warming. AzTU conducts scientific research on reducing greenhouse gas emissions and environmental pollution, particularly in the oil and chemical industries, and will continue to do so.

The resulting rise in global temperatures has intensified extreme weather events such as storms, droughts, heatwaves, hurricanes, and floods, and has caused glaciers to melt and sea levels to rise. The oceans have absorbed most of the excess heat, and warming now reaches depths of 2000 meters, harming marine flora and fauna.

AzTU’s leadership and employees are committed to contributing to the global goal of limiting the rise in average temperature to well below 2°C, and pursuing efforts to limit it to 1.5°C.

Scope

This Plan applies to all students (bachelor’s, master’s, and doctoral), academic staff, and administrative staff of Azerbaijan Technical University (AzTU). It includes, in particular, those in bachelor’s programs such as “Environmental Engineering,” “Chemical Engineering,” and “Occupational Safety Engineering,” and in master’s programs such as “Reprocessing Technologies of Metallurgical Waste,” “Efficient Use and Protection of Natural Resources,” “Conservation and Recycling of Natural Resources,” “Transport Ecology,” and “Environmental Protection in the Oil and Chemical Industry,” as well as other related fields. It also applies to all participants in the university’s events and social activities.

Core Values

This Plan opposes activities that contribute to climate change through greenhouse gas emissions and environmental pollution, and supports efforts to reduce them in all sectors through education, research, and cooperation.

This Plan declares AzTU’s commitment to environmental protection, to reducing the risks and impacts of climate change, and to creating a clean, healthy environment that supports human well-being.

AzTU promotes a work culture that prevents environmental pollution and encourages responsible practices, including the avoidance of open burning of waste, the discharge of untreated effluents into the environment, or the emission of gases into the atmosphere without purification.

Education and Awareness

AzTU is committed to organizing regular conferences, seminars, and training sessions to raise awareness of environmental pollution and climate change and of ways to reduce them. These activities aim to build knowledge and a culture of environmental responsibility within the AzTU community and among the wider public.

The “Eco-Technology” society operates at AzTU and brings together bachelor’s, master’s, and doctoral students and faculty. The society carries out awareness-raising activities and publishes scientific articles on climate change and environmental protection.

Management and Responsibilities

1. All members of the AzTU community, including leaders (rectors and vice-rectors), employees, workers, students, and faculty, share responsibility for supporting and promoting this Plan and the reduction of pollution that contributes to climate change.
2. Heads of departments and units, and academic staff, bear direct responsibility for preventing and addressing environmental incidents within their areas of competence and for reporting them promptly. The Department of Labor Protection and Technical Safety is responsible for coordinating the implementation of these activities.
3. Any member of the AzTU community who witnesses an environmental incident, such as pollution, leaks, uncontrolled emissions, or open burning of waste, must report it immediately to the Department of Labor Protection and Technical Safety or another responsible person.
4. All members of the AzTU community collaborate on joint activities based on the approved action plan to promote sustainable development, address climate change, and protect ecosystems on the university campus and at other AzTU facilities.

3 Carbon Reduction

Carbon Reduction Targets

Azerbaijan has committed to reducing greenhouse gas emissions by 40% by 2035 compared to 1990 levels. AzTU supports this commitment and has set a target of net-zero carbon emissions by 2050. To achieve it, the university will address emissions across all three scopes.

40%
National greenhouse gas emissions reduction commitment by 2035, compared to 1990 levels

Net zero
AzTU target for carbon emissions by 2050, addressing all three emission scopes

Scope 1 Direct emissions

Emissions from sources the university owns or controls.

- Replace gasoline and diesel vehicles used on campus with electric or hybrid vehicles.
- Move building heating to lower-emission systems, using natural gas only as a transitional step and shifting to biogas or electric heating where feasible.
- Replace backup diesel generators with battery storage or renewable systems.
- Improve building efficiency through better insulation, efficient lighting, and low-emission appliances.

Scope 2 Purchased energy

Emissions from electricity, heating, and cooling the university buys.

- Expand on-site renewable energy, building on the existing wind turbines and planned solar panels, and purchase green electricity where available.
- Reduce energy consumption through efficient appliances, smart lighting, and upgraded heating and cooling systems.
- Carry out regular energy audits and optimize energy management.
- Invest in energy storage so more renewable energy can be used on campus.

Scope 3 Other indirect emissions

Emissions from commuting, waste, and purchasing.

- Encourage walking, cycling, and public transport, with bike-sharing or electric scooter stations if feasible.
- Reduce waste through recycling, composting, fewer single-use plastics, and less food waste in canteens.
- Consider the carbon footprint in procurement, including sustainable materials, efficient equipment, and local sourcing, and encourage suppliers to set their own reduction goals.

Implementation

AzTU will establish a baseline emissions inventory, set interim targets, and report progress annually. A student-led sustainability committee will support these efforts and promote them across campus.

By taking these steps, AzTU will systematically reduce its emissions and contribute to national and global climate goals.

4 Current Situation of SDGs at AzTU

Ensuring Clean and Safe Drinking Water

AzTU is located in the Yasamal district of Baku. Drinking water for the district, including the university, comes from the city's central supply system, which draws on sources such as the Jeyranbatan reservoir and the Oguz-Gabala-Baku water pipeline, supplemented by other aqueducts and groundwater sources.

Water supplied to the city and to AzTU is treated and disinfected using modern technologies. AzTU's specialized laboratories test drinking water on campus using physical, chemical, and physico-chemical methods. These tests include heavy metals, nitrites and nitrates, turbidity, and general chemical and physical composition, and are carried out to protect the health of students, employees, and visitors. Water quality is assessed against national drinking water standards, including limits for substances such as fluoride and calcium.

Because climate change increases the risk of water scarcity, AzTU promotes responsible water use among its students and staff and supports research on wastewater purification (see Goal 5).

Access to Drinking Water

AzTU provides free drinking water to students, staff, and visitors. Drinking water dispensers are available in every classroom and office on campus, and a drinking fountain in the campus garden is open to everyone.

Azersu, the national water utility, is responsible for the quality of the supplied water, and the university also monitors it through its own laboratories. Mineral water is also made available to employees and visitors.



Biodiversity Conservation

AzTU works to protect and expand green areas on its campus. The university has planted a variety of drought-resistant trees and other plants, which are well suited to Baku's dry climate, and university gardeners provide regular agrotechnical care, including soil preparation, watering, and planting of new species.

Greening the campus supports local biodiversity, improves air quality, and helps absorb carbon dioxide, which links this work to the university's climate goals. For specialist support, AzTU works with the city's landscaping and green management services.



Environmental Education and Waste Management

AzTU trains specialists in Ecological Engineering and Environmental Protection, so ecosystems, and water quality in particular, have an important place in teaching. Courses on waste management, recycling, and cleaner production are taught at both bachelor's and master's levels.

Household and plastic waste are major concerns because of their volume. Plastic persists in the environment for hundreds of years, fills landfills, and pollutes rivers, seas, and oceans, making it a global problem. Reducing plastic use comes first, followed by reuse and recycling. Recycled plastic can be turned into packaging boxes, waste bins, and household items that do not come into contact with food. Collection points in places such as catering establishments, parks, and educational institutions make recycling easier.

AzTU students take part as volunteers in waste reduction and cleanup campaigns, including collecting and handing over plastic containers in the city's recreation areas and on its beaches.



Compliance with the SDGs

SDG 13 Climate Action

AzTU supports Sustainable Development Goal 13 (Climate Action) and is committed to achieving net zero greenhouse gas emissions by 2050. The university contributes through research and technology on wastewater purification and soil remediation, through climate education for students and staff, and through outreach tailored to different audiences, including students at various levels and the wider public.

Progress toward net zero will be guided by transparent monitoring, annual reporting, and active engagement with government bodies, industry partners, and the university community. The specific measures for reducing emissions are set out in the Carbon Reduction Targets section.

By working toward net zero by 2050, AzTU aims to contribute to a healthier planet while preparing engineers and professionals to build a more sustainable future.

SDG 4 Quality Education

AzTU supports Sustainable Development Goal 4 (Quality Education) and Goal 13 (Climate Action) by integrating sustainability, environmental ethics, and climate action into its academic programs and research. The university promotes a culture of environmental responsibility among its students and faculty.

Addressing climate change requires collaboration across disciplines, so AzTU works to bring these topics into a range of programs, including environmental engineering, chemical engineering, and occupational safety engineering, and into master's and doctoral education. Students gain the knowledge and skills to tackle environmental problems, and the "Eco-Technology" society offers further opportunities to take part in research and awareness activities.

Through its curricula and research, AzTU aims to prepare professionals who can address global environmental challenges and contribute to sustainable development in Azerbaijan and beyond.

Engagement with the COP Process

AzTU follows the work of the UN Climate Change Conferences (COP), including COP29, hosted by Azerbaijan in Baku in 2024, and aligns its activities with their outcomes. To contribute to this process, the university will:

1. **Research and innovation:** Share research on emission reduction, wastewater purification, and soil remediation through conferences, publications, and side events related to the COP process.
2. **Student involvement:** Encourage students and members of the Eco-Technology society to take part in climate conferences, youth forums, and related events, and to follow international climate negotiations.
3. **Policy engagement:** Support national climate policy by providing expert input from faculty to government bodies and environmental organizations.
4. **Capacity building:** Organize training programs, workshops, and joint projects that strengthen climate skills, building on the university's own conferences and symposiums.

5 Environmental Challenges and AzTU's Role

Environmental issues are especially relevant to AzTU. In Azerbaijan, the oil and gas industry is one of the main sources of environmental pollution, and leaks, accidents, and losses during extraction, storage, transport, and processing contribute to it.

Biodiversity loss and ecosystem degradation are major global concerns, and attention is growing to ecosystem services, the benefits nature provides to people, and their effects on human well-being. Assessing these services and integrating their value into public and private decision-making is a key objective of national and international strategies on biodiversity, ecosystem conservation, and sustainable development.

Many ecosystem services are degraded or used unsustainably, which harms business and production. The consequences include:

- Services that are currently free, such as clean water, will become costly as ecosystems degrade.

- The loss of ecosystem services raises costs and risks for enterprises, including worker safety and insurance.
- More efficient use of ecosystem services opens new business opportunities.

Disrupting water ecosystems, for example, affects biodiversity, agriculture, food production, and climate, and can stop an enterprise from operating. Industrial emissions of carbon dioxide and methane strengthen the greenhouse effect and drive climate change, while gases such as CO, SO2, NO2, and H2S harm air quality and health.

AzTU responds to these challenges through education and research preparing specialists in environmental protection and carrying out scientific work on pollution and emission reduction.

6 Climate Action Plans of AzTU

Climate Action Plans

- Conducting lectures and seminars on environmental sustainability to educate students.
- Training doctoral students and assigning dissertation topics on climate change mitigation, with practical exercises for the oil and chemical industries and intensive scientific research.
- Organizing conferences and symposiums for students and the “Eco-Technology” community to discuss climate change, mitigation strategies, and modern research methods for minimizing emissions (CO2, H2S, NOx).
- Publishing scientific articles on climate change and mitigation strategies in prestigious international journals (Web of Science, Scopus, etc.) by the university’s professorial staff.
- Exploring the scientific foundations and practical application of technologies for purifying wastewater to address water scarcity related to climate change.
- Developing and implementing technologies for cleaning oil-contaminated soil at AzTU.

Goals and Action Steps

GOAL 1 Increase Awareness of Environmental Sustainability Among Students

ACTION STEPS

- Develop a comprehensive curriculum and organize seminars on environmental sustainability.
- Invite guest speakers and experts to share insights and practical experience.
- Facilitate interactive discussions and workshops to encourage active student participation.
- Provide resources and materials to support student learning.

GOAL 2 Strengthen Doctoral Training and Research on Climate Change Mitigation

ACTION STEPS

- Design and organize training sessions and practical exercises on climate change mitigation, focusing on its impact on the oil and chemical industries.
- Assign dissertation topics related to climate change and support intensive scientific research.
- Provide resources, tools, funding, and access to research facilities.
- Facilitate collaboration with industry partners and research institutions, and provide ongoing mentorship throughout training and research.

GOAL 3 Foster Collaboration, Knowledge Exchange, and Research Innovation Through Conferences and Symposiums

ACTION STEPS

- Plan and organize conferences and symposiums on climate change, mitigation strategies, and modern research methods for reducing emissions (CO2, H2S, NOx).
- Invite researchers, experts, and stakeholders from various fields to participate.
- Encourage students to present their research findings and innovative solutions.
- Facilitate networking and interdisciplinary collaboration among students, faculty, and participants.
- Organize open lectures and community events to raise public awareness of climate change.

GOAL 4 Promote Scholarly Contributions on Climate Change in Prestigious Journals

ACTION STEPS

- Encourage university professors to conduct research and write scientific articles on climate change and mitigation strategies.
- Support faculty in submitting articles to reputable international journals (Web of Science, Scopus, etc.).
- Collaborate with editorial boards and reviewers to ensure publication quality.
- Track and measure the impact of published articles on advancing knowledge in the field.

GOAL 5 Investigate Wastewater Purification Technologies to Address Water Scarcity

ACTION STEPS

- Research innovative technologies for wastewater treatment.
- Collaborate with industry partners and experts in the field.
- Pilot test promising technologies in real-world settings.
- Disseminate findings and recommendations to stakeholders and policymakers.

GOAL 6 Develop and Implement Soil Remediation Technologies for Oil-Contaminated Areas

ACTION STEPS

- Conduct research to identify effective methods for cleaning oil-contaminated soil.
- Design and test prototype remediation technologies in laboratory settings.
- Conduct field trials to assess the feasibility and efficacy of selected methods.
- Collaborate with environmental agencies and local communities for implementation and monitoring.

A Alignment with the Sustainable Development Goals

The Plan contributes to the Sustainable Development Goals shown below. Primary goals are addressed directly by measures and goals in this Plan; supporting goals are addressed in part. Target numbers refer to the UN 2030 Agenda for Sustainable Development.



PRIMARY GOALS

13 Climate Action	**Targets 13.2 · 13.3** Climate measures integrated into university planning; education, awareness and capacity on climate change.	Net-zero target and Scope 1–3 measures (Ch. 3); Compliance with the SDGs and COP engagement (Ch. 4); Goals 1–3.
4 Quality Education	**Targets 4.7** Knowledge and skills for sustainable development, delivered through programs, research and the Eco-Technology society.	Education and Awareness (Ch. 2); Environmental Education and Waste Management (Ch. 4); Goals 1–2.
6 Clean Water and Sanitation	**Targets 6.1 · 6.3** Safe drinking water on campus; water quality, pollution control and wastewater treatment research.	Clean and Safe Drinking Water, Access to Drinking Water (Ch. 4); Goal 5.
7 Affordable and Clean Energy	**Targets 7.2 · 7.3** Renewable energy (wind turbines, planned solar panels) and energy efficiency of buildings and equipment.	Current Initiatives (Ch. 1); Scope 1 and Scope 2 measures (Ch. 3).
9 Industry, Innovation and Infrastructure	**Targets 9.4 · 9.5** Scientific research and cleaner technologies for the oil, chemical and water sectors.	Environmental Challenges (Ch. 5); Goals 2–6 (Ch. 6).
12 Responsible Consumption and Production	**Targets 12.5** Waste reduction through prevention, recycling and reuse; fewer single-use plastics.	Waste Management (Ch. 4); Scope 3 (Ch. 3).
15 Life on Land	**Targets 15.3** Remediation of oil-contaminated soil; campus greening and biodiversity.	Goal 6 (Ch. 6); Biodiversity Conservation (Ch. 4).

SUPPORTING GOALS

3 Good Health and Well-being	**Targets 3.9** Reducing health risks from air, water and soil pollution.	Drinking water testing (Ch. 4); air quality impacts (Ch. 5).
11 Sustainable Cities and Communities	**Targets 11.6** Support for smart cities and villages; air quality and waste management.	Current Initiatives (Ch. 1); Scope 3 (Ch. 3).
14 Life Below Water	**Targets 14.1** Reducing plastic pollution of rivers, seas and beaches through clean-up campaigns.	Waste Management (Ch. 4).
17 Partnerships for the Goals	**Targets 17.16 · 17.17** University networks, industry and government partners, and the COP process.	Current Initiatives (Ch. 1); COP engagement (Ch. 4); Goals 3 and 5.

The alignment is indicative and was prepared for this draft from the content of the Plan. "Ch." refers to the numbered chapters of this document.