



IZTECH Climate Change Action Plan (2025–2050)

'Building a Sustainable Campus is Our Priority'

Introduction

Izmir Institute of Technology (IZTECH) is committed to formulating an institutional plan to attain net-zero greenhouse gas (GHG) emissions and to increase the University's sustainability research and instructional initiatives. In line with its goal of becoming a Climate-Friendly University, IZTECH is also working to develop and implement policies to reduce GHG emissions, conserve natural resources, promote their sustainable use, and tackle climate change.

The Paris Agreement, adopted at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015 and entered into force on November 4, 2016, aims to limit the increase in global average temperature to well below 2°C by the end of this century (2100), and to pursue efforts to limit it to 1.5°C. Following the Paris Agreement, the European Union published the European Green Deal in December 2019, setting ambitious climate targets: a 50–55% reduction in emissions by 2030, and achieving net-zero emissions by 2050.

In Türkiye, the law approving the Paris Agreement was published in the Official Gazette on October 7, 2021, thereby entering into force. Additionally, the President of the Republic of Türkiye has announced the national goal of achieving net-zero emissions by 2053. To effectively combat climate change, it is essential to implement greenhouse gas reduction measures across all sectors, particularly energy, transportation, industry, urbanization, and agriculture. In this context, key priority areas include:

- Reducing the use of fossil fuels,
- Increasing the use of renewable energy sources,
- Conducting agricultural activities in line with sustainability principles,
- Protecting the quantity and quality of water resources.

IZTECH acknowledges its responsibility in addressing the climate crisis and supporting Türkiye's pledge under the Paris Agreement to limit global warming to well below 2°C, aiming for 1.5°C. This action plan outlines IZTECH's roadmap to reduce its carbon footprint, transition to clean energy, and embed climate resilience into campus planning.

Vision

To become a carbon-neutral, climate-resilient, and innovation-driven research campus — a model green campus in the Mediterranean region by 2050.

Mission

IZTECH is committed to leading a transformative and equitable climate transition that not only meets but exceeds the goals of the Paris Agreement. By harnessing the power of research, innovation, education, infrastructure, and collaboration, the university aims to become a model of climate leadership in higher education.

We are committed to the following objectives:

- Substantially reducing greenhouse gas (GHG) emissions across all campus operations and activities;
- Adapting to climate-related risks through the implementation of resilient, nature-based, and science-informed solutions;
- Promoting a just and inclusive climate action grounded in the principles of equity, diversity, and social responsibility;
- Integrating climate science and sustainability into all academic disciplines and research agendas;
- Engaging students, faculty, staff, local communities, and global partners in the collective effort to build a sustainable and climate-resilient future.

Current Situation on Campus

IZTECH is located in the Urla region, within the borders of Izmir Province in western Türkiye. The campus is one of the largest in the country, spanning a total area of 35,000,000 m². The landscape is predominantly composed of gently sloping terrains and plains, featuring Mediterranean pine forests, maquis (Mediterranean shrublands) with rich biodiversity, wetlands, and small but fertile plains. The region has a typical Mediterranean climate, characterized by hot, dry summers and mild, rainy winters.

IZTECH's campus initiatives in infrastructure, energy, transportation, waste, water and education are driving us toward becoming a leader in sustainable development. The current status of these six thematic areas on campus is summarized below. For more detailed information, please refer to the link provided below.

Link: <https://sustainability.iyte.edu.tr/>

Infrastructure: Recent infrastructure developments at IZTECH, with a focus on green spaces and healthcare, have significantly enhanced campus life. Ongoing projects have enabled the university to significantly enhance its vegetated area over the past 5 years, now totaling 5,856,320 m². IZTECH is also committed to the conservation of plant, animal, and wildlife genetic resources related to food and agriculture, securing them in dedicated conservation facilities. Our campus houses two greenhouses used for plant science research and the propagation of ornamental plants for landscaping purposes.

These research activities are carried out by the Izmir Institute of Technology Plant Science Application and Research Center, which focuses primarily on plant genetics and biotechnology. Currently, the center is conducting several research projects related to the conservation of local species.

Energy: Our campus continues to operate as a positive-energy institution, supported by the recent installation of photovoltaic (PV) panels on the rooftops of the engineering faculty buildings, contributing an additional 280,000 kWh of electricity annually. Outdated heating systems have been replaced with modern electric alternatives, and insulation improvements on rooftops have been completed—both measures significantly reducing energy consumption and enhancing indoor comfort. Solar panels and wind turbines are actively operating on campus. Electricity is generated by solar panels installed on the rooftops of several buildings, and solar energy is also used to heat the swimming pool. Wind turbines located on campus, with a total capacity of 13.5 MW, produce approximately five times more electricity than the campus consumes. The surplus electricity is transferred to the city grid.

Transportation: A new agreement has expanded the frequency of transit bus services, leading to a significant 28% reduction in private vehicle entries to the campus. For the first time, two electric bicycles have been made available to students with physical disabilities, promoting greater equity and accessibility across campus. Additionally, parking areas occupy only 0.1% of the total campus area, reflecting a commitment to sustainable land use and reduced car dependency. Two electric vehicles were purchased for use within the university. Additionally, ten electric charging stations have already been installed in the campus area.

Waste: The campus generates various types of hazardous waste, including batteries, laboratory chemicals, and electronic waste. In the past year, a total of 6.54 tons of toxic waste were processed, with each category requiring specialized handling and treatment. Dedicated vehicles—such as those assigned to general inorganic waste and paper/cardboard recyclables—ensure proper collection and transportation in line with the highest environmental standards. The university's strong commitment to recycling is further highlighted by its receipt of the Zero Waste Certificate, awarded in 2022 by the Ministry of Environment, Urbanization, and Climate Change, recognizing IZTECH's efforts in waste minimization and resource recovery.

Water: Our commitment to water sustainability is evident in the recent 13.2% reduction in campus-wide water consumption, which has decreased to 297,453 m³. Recycled wastewater now meets 51.3% of our total water needs, supplied by a treatment plant with a daily capacity of 1,500 m³. In addition, rainwater harvesting efforts have yielded 5.4 m³, helping to sustain the natural greenery around collection areas and reduce reliance on freshwater sources.

Education: Our commitment to sustainability in education is reflected in the integration of sustainability content across 1,141 courses out of a total of 4,434 offered in the 2023–2024 academic year. These courses span multiple faculties, including Engineering,

Natural Sciences, and Architecture, and directly address UN Sustainable Development Goals through themes such as energy efficiency, renewable energy, urban sustainability, environmental ethics, and disaster management. Campus-wide initiatives such as the “Global Sustainable Development” course, open to all students, further enhance interdisciplinary learning. Beyond the curriculum, 155 sustainability-related events, seminars, and workshops were organized between 2021 and 2023, with a rising trend after the pandemic. In addition, around 40 active student organizations foster hands-on engagement with ecological practices, renewable energy, and community-driven sustainability projects, ensuring that sustainability principles are embedded both in academic programs and in the wider campus culture.

Goals and Action Plans

The Climate Change Action Plan has been developed to safeguard regional and national well-being by promoting a low-carbon development framework and implementing an efficient water management system.

As part of this plan, short-term (2025–2030), medium-term (2030–2050), and long-term (2050–2070) strategies and capacity-building opportunities have been identified in the following priority areas to support climate change adaptation and risk reduction:

- Energy Management
- Transportation Systems
- Water Management
- Waste Management
- Education and Public Awareness

Through its strategic approaches in these areas, Izmir Institute of Technology aims to minimize environmental impact, increase resource efficiency, and build institutional resilience against the climate crisis.

1. Carbon Neutral Campus

Goal: Reduce campus-wide carbon emissions by 25% by 2030 (baseline: 2023).

Actions:

Term	Milestone	Status	Monitoring
Short-term	Encourage hybrid work models, video conferencing, and e-learning platforms to reduce travel emissions.	100%	% of total courses offered online or in hybrid mode and Average number of days on campus per person per week/month

Medium-term	Electrify university fleet and install EV charging stations.	25% 50% 100%	Percentage of Electric Vehicles (EVs) in the Fleet and Number of Installed EV Charging Stations
Short-term	Implement energy-efficient retrofits for all buildings (LED, insulation, HVAC upgrades).	100%	kWh used for lighting per building and Annual energy consumption per square meter
Short-term	Launch a "Green Labs" initiative to reduce lab emissions.	100%	% of lab staff trained in sustainable lab practices and Total electricity or energy consumption per lab per year
Short-term	A Pilot net-positive energy building	100%	Total renewable energy produced - total energy consumed
Medium-term	Increase the diversity of renewable energy sources	50%	Track how many different types of renewable energy systems are implemented.
Medium-term	Install daylight sensors throughout the Integrated Research Centers (TAM) building	50%	Record electricity consumption before and after daylight sensor installation.
Long-term	Reconfiguring the central air conditioning system to enable zoned temperature control, with each area (corridors, offices, laboratories, etc.) managed by separate control panels	75%	Record energy consumption.

2. Renewable Energy Transition (100% RE Vision)

Goal: Increase the share of renewable electricity generation to exceed 25% of total consumption by 2030, 50% by 2040, and achieve 100% renewable electricity consumption by 2050.

Actions:

Term	Milestone	Status	Monitoring
Medium-term	Solar PV systems (rooftop, carports, floating PV) across all available surfaces.	50%	Number of installations per type
Medium-term	Wind generation (onshore and offshore) based on feasibility study and wind atlas data.	75%	Total electricity generated by wind turbines annually
Medium-term	Battery Energy Storage Systems (BESS) for campus microgrid resilience	75%	Total energy storage capacity installed on campus
Medium-term	Solar thermal collectors in cafeterias, dorms, and research centers.	50%	Amount of heat energy generated by the solar thermal collectors annually
Medium-term	Implement digital tools and technologies to enhance real-time monitoring and management of renewable energy systems	50%	Energy Output

3. Sustainable Mobility

Goal: Reduce single-occupancy vehicle use by 30% by promoting carpooling and remote work/study options

Actions:

Term	Milestone	Status	Monitoring
Short-term	Install 5-kilometer shaded walkway with pedestrian safety	100%	Install motion or pressure sensors to measure daily and peak pedestrian flow.
Short-term	Install 5 km of bicycle lanes, covered bike parks, and electric scooter hubs.	50%	Number of daily/weekly users of bicycles and e-scooters on campus
Medium-term	Replace vehicles including shuttle fleet with electric/hybrid shuttles	25%	Number of electric and hybrid vehicles in the fleet

4. Sustainable Water Management

Goal: Reduce water consumption by 30% and enhance water resilience.

Actions:

Term	Milestone	Status	Monitoring
Short-term	Install grey-water reuse (water in swimming pool)	50%	Cubic meters (m ³) of grey-water collected and reused monthly/annually

Short-term	Install rainwater harvesting systems.	50%	The amount of rainwater collected monthly/annually
Short-term	Investigation of accessible and efficiently exploitable groundwater resources	100%	Percentage of total land area surveyed for groundwater potential
Short-term	Increase permeable pedestrian pathways and areas	%50	Total surface area of pathways
Short-term	Switching from liquid soap to foam soap to reduce water consumption	100%	Amount of liquid soap used and related billing data
Short-term	Document the existing natural resources on campus land and map all freshwater sources, existing water routes, and areas of campus	100%	Total length of natural and artificial watercourses (streams, drainage channels) mapped with GIS tools
Short-term	Use smart irrigation systems and drought-resistant landscaping.	25%	Total volume of water used for irrigation (m ³ /month or year)

Medium-term	Monitor and optimize water use in laboratories and dormitories.	25%	Number of leaks identified and fixed per period and Total volume of water consumed separately in laboratories and dormitories
Short-term	Increase the number of areas with water fountains on campus	50%	Map and measure the distribution of water fountains across the campus
Medium-term	Integrating seawater desalination systems with renewable energy sources—such as solar, wind, or geothermal	50%	% of freshwater extracted from seawater
Medium-term	Implement digital tools and technologies to enhance real-time monitoring and management of efficient water management	50%	Collect real-time data on water flow
Long-term	Implementation of a closed-loop water recycling line/system (e.g. Integrated Research Centers)	50%	Calculate water savings

5. Zero Waste Campus

Goal: Achieve 70% waste diversion from landfill.

Actions:

Term	Milestone	Status	Monitoring
Short-term	Expand composting, recycling, and food waste reduction programs.	50%	Percentage of total waste diverted to composting, recycling, or reuse programs; Number or % of dining facilities, cafes, or events participating in waste reduction; Volume or weight of single-use items eliminated or replaced with sustainable alternatives
Short-term	Implement reusable container systems and ban single-use plastics.	50%	Total reusable containers issued to students, staff, dining services, etc
Medium-term	Integrate digital documentation to reduce paper use.	75%	Track paper purchases
Short-term	Establishment of a campus-wide system for collecting household waste oils through the installation of strategically placed collection bins	50%	Measure the amount (in liters or kilograms) of waste oil collected from each bin
Medium-term	Biomass Energy Generation from Forest and Plant Residues	50%	Calculate the ratio of energy output to feedstock input (energy efficiency)
Short-term	Utilization of Pruning Waste for Mulching	50%	Track the volume of pruning waste collected and processed for mulch.

Medium-term	Implement digital tools and technologies to enhance real-time monitoring and management of zero waste initiative	50%	Track total waste generated
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6. Climate Education, Research, and Innovation

Goal: Empower students, staff, and faculty as climate leaders.

Actions:

Term	Milestone	Status	Monitoring
Short-term	Offer interdisciplinary climate and sustainability courses.	100%	Number of newly introduced interdisciplinary sustainability courses per academic year and Number or percentage of courses that integrate sustainability-related topics into their curriculum
Medium-term	Establish a Climate Innovation Hub supporting startups and projects.	50%	Number of climate-focused startups supported annually
Short-term	Host annual Climate Action Week with workshops and exhibitions.	75%	Total number of sessions, workshops, panels, exhibitions, and activities hosted during annually; Survey feedback scores
Short-term	Incentives can be promoted for projects that are sustainability-themed and aligned with the Sustainable Development Goals (SDGs)	25%	Number of sustainability-themed projects supported annually

7. Funding and Strategic Partnerships

- Access:
 - EU Green Deal funding
 - TÜBİTAK 1004 / 1512 / Horizon Europe funds
 - National Climate Finance Mechanisms
- Partner with:

i. Governmental Partners

- Izmir Metropolitan Municipality
- Local Governments / Municipalities
- General Directorate of State Hydraulic Works (DSİ)
- Izmir Water and Sewerage Administration (IZSU)
- Ministry of Agriculture and Forestry
- Ministry of Environment, Urbanization and Climate Change
- Ministry of Energy and Natural Resources

ii. Academic & Research Institutions

- National universities (e.g. Ege University)
- The Scientific and Technological Research Council of Turkey (TUBİTAK)
- Sustainable Development Solutions Network (UN SDSN) and other international networks

iii. NGOs & Civil Society

- Local environmental and climate action NGOs
- Community-based sustainability organizations

iv. Private Sector

- Renewable energy companies
- Renewable Energy R&D clusters

8. Evaluation

Evaluation of climate action plans through Higher Education Quality Board (YÖKAK) evaluation results, stakeholder feedback integration, including:

- Number of surveys, workshops, or consultation sessions conducted annually
- Percentage of students, staff, and partners participating in feedback activities.

Conclusion

By aligning this 2025–2050 strategy with the Paris Agreement, IZTECH strengthens its identity as a climate-smart research university. Through systemic decarbonization, resilience building, and academic innovation, IZTECH will serve as a role model for Türkiye’s low-carbon transformation, empowering the next generation to tackle climate change globally and equitably.