

13 CLIMATE ACTION



NUMBER OF
PUBLICATIONS & THESES

13



NUMBER OF
PROJECTS

3



NUMBER OF
EVENTS

15



NUMBER OF
COURSES OFFERED

20



NUMBER OF
COLLABORATIONS

8



NUMBER OF
AWARDS

7

SDG 13 CLIMATE ACTION

Take urgent action to combat climate change and its impacts

Targets and Indicators

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

13.2 Integrate climate change measures into national policies, strategies and planning

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning

13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible

13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

Courses, Theses, Publications

On October 14, 2021, TEDU's University Senate made a commitment to pursue the Sustainable Development Goals (SDGs) to enhance awareness of these issues both at the university and in the local community.

Courses

TEDU offers 20 courses that directly support SDG 13: Climate Action Among these, two graduate-level and one undergraduate level courses offered by the Electrical and



Electronics Engineering Department and the Civil Engineering Department stand out for their strong integration of climate-focused learning outcomes.

EE 562 Economic Operation of Power Systems: This course is designed to equip graduate students with advanced competencies in the operation and management of modern power systems. The course cultivates an understanding of how technological and economic strategies can support sustainable energy transitions. A key learning outcome that reflects this target is the ability to analyze the opportunities and challenges that emerging distributed energy resources pose for the future operation and control of electricity systems.

CE 571 Sustainable Construction: This course provides students with the theoretical foundation and practical tools needed to implement green building principles and sustainable construction techniques. One of the core learning outcomes of this course is the capacity to evaluate renewable energy technologies in terms of their strengths and limitations, fostering both technical literacy and environmental responsibility among future engineers.

ENGR 490 Contemporary Issues in Engineering: This course is a senior level course and engages students in a series of seminars addressing emerging topics in engineering practice. The course aims to deepen students' understanding of the environmental and societal impacts of engineering decisions, fostering awareness of how technological choices contribute to or mitigate climate change. It also provides an opportunity for students to conduct focused studies on selected sustainability-related issues, integrating theory with applied research.

Theses

A graduate thesis titled “**Climate-Related Financial Disclosures: The Case of Commercial Banks in Türkiye**” examines the extent and quality of climate-related financial reporting in Türkiye's banking sector. The study evaluates banks' climate-

change disclosures using the Task Force on Climate-related Financial Disclosures (TCFD) framework and compares the results with their Carbon Disclosure Project (CDP) scores and key financial indicators. By generating data-driven insights into how financial institutions integrate climate risk into governance and transparency mechanisms, the research provides valuable evidence for national-level climate strategies and regulatory frameworks.

Another thesis completed in the Department of Mechanical Engineering, titled “**Machine Learning-Based Performance Prediction of Variable-Speed Hydraulic Turbines**,” focuses on optimizing the efficiency of Francis-type turbines, known for their high hydraulic performance. Using computational fluid dynamics (CFD) simulations, the study generated synthetic data to train two distinct machine-learning models, creating a digital twin of the turbine system. The analysis explored efficiency optimization by adjusting angular velocity, providing insights for more energy-efficient hydroelectric generation..

Publications

An article authored by TEDU researchers, titled “**Exploring Renewable Energy on the Coastline of Türkiye: Wind and Wave Power Potential**,” evaluates the wind and wave energy capacity along Türkiye's extensive coastline. The study offers a comprehensive analysis of the country's renewable energy potential in coastal regions, highlighting opportunities for the strategic development and sustainable utilization of marine-based energy resources. By generating critical data for energy policymakers and planners, this research provides evidence-based insights that can inform national energy strategies and enhance climate adaptation and mitigation policies.

Another publication by TEDU researchers, titled “**Strategic Adaptation to Climate Change through Monte Carlo-Based Multi-Criteria Decision Model in Marine Spatial Planning**,” addresses the complex policy and planning challenges posed by climate change in marine and coastal zones. The study



introduces a Monte Carlo-based multi-criteria decision-making model to assess the vulnerability of coastal defenses to climate-induced risks such as sea-level rise and storm surges. By developing a framework for strategic adaptation and resilience planning, the study underscores the necessity of evidence-driven policymaking in mitigating long-term environmental and socio-economic risks.

Events - Activities

There are 15 events organized and hosted by TEDU related with SDG 13. The Sustainability Conference activity held by SDS Student Hub Society took place in May 2024 with two panels and six invited speakers.

In December 2024, the TEDU Economics Research Student Society organized the “Climate Change and Sustainability,” conference. They hosted two invited speakers and attracting broad participation from the university community (See Image 1 and 2).



Image 1. Climate Change and Sustainability Conference

Climate Change and Sustainability Talk: Prof. Dr. Erdem Başçı, with Ms. Sultan Tepe, President of the Istanbul Chamber of Industry Sustainability Platform, as the guest speaker, moderated the event. The discussion focused on the economic dimensions of climate change, sustainable industrial practices, and the role of financial systems in facilitating the green transition.

The conference was open to all members of the TEDU community and additionally broadcast online to ensure accessibility and

wide engagement. Through this platform, participants gained a deeper understanding of climate change mitigation strategies, sustainability-driven policy approaches, and institutional capacity building.



Image 2. Keynotes-Climate Change and Sustainability Talk

Guest Lecture on Seismic and Tsunami-Resilient Design: On May 15, 2024, Cristián Alfredo Wittig Grell delivered the lecture titled “Successful New Anti-Seismic and Anti-Tsunami Architectural and Engineering Design Strategies from the Accumulated Chilean Experience (in the Context of Development of the ICAUS Turkey 2024–2025)” at 12:00 PM in the Ahmet Ersan Conference Hall (See Image 3).





Image 3. Guest Lecture on Seismic and Tsunami-Resilient Design

The presentation focused on architectural and engineering strategies for disaster-resilient urban design based on Chile's extensive experience in earthquake and tsunami preparedness. Participants gained insight into sustainable and adaptive construction practices and learned how climate resilience and disaster risk reduction can be integrated into built-environment planning.

Collaborations, Projects, Awards

Collaborations

AFETTEK: TEDU is the General Coordinator of the Disaster and Emergency Technologies Platform, known as AFETTEK, which is an initiative established by a coalition of universities, NGOs, private sector entities, and associations representing these institutions (See Image 4). AFETTEK envisions collaborative efforts in disaster-resistant structures, life sciences, climate and environmental technologies. By fostering public-private partnerships, AFETTEK also seeks to raise public awareness and preparedness in the face of disasters.



ORGANIZATIONAL DISTRIBUTION	PLATFORM FOUNDERS	PLATFORM MEMBERS TOTAL	CLUSTERING STAKEHOLDERS
UNIVERSITIES	5	11	8
RESEARCH INSTITUTIONS, OZG. TECHNOLOGY CENTERS	3	8	3
ASSOCIATIONS, UNIONS, CLUSTERING, COOPERATIONS	2	15	11
FOUNDATIONS	2	5	4
PRIVATE SECTOR (COMMERCIAL, INDUSTRIAL)	—	82	88
TOTAL	12	131	77

Image 4. AFETTEK Platform

Through its coordination role, TEDU actively engages in collaborative planning and coordination with national and local government institutions to strengthen preparedness for climate-related disasters, including those that may lead to displacement across borders. The university also provides technical input and expert consultation to regional authorities on early warning mechanisms, disaster monitoring, and climate risk management, thereby supporting evidence-based decision-making at the local and regional levels.

The AFETTEK Platform application includes work packages under 28 headings. The platform contributes to Target 13.1 "Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries" with two aspects. First, it is an umbrella, which holds an ecosystem for different sectors (information technology, resilient sustainable built environment, life sciences technology, climate agriculture and environmental technology, and industrial Technologies). Second, its focus is mainly on the prevention of devastating effects of disasters and emergencies and reduce the effects of inevitable ones (See Image 5).



FOCUS AREAS

Information and Communication Tech.	Resilient Sustainable Built Environment	Life Sciences Tech.	Climate, Agriculture and Environmental Tech.	Industrial Technologies
- Data Science (Big Data Processing, Prediction, Data Transfer, etc.) - Deep Learning (DL) and Machine Learning (ML) Systems - Cloud Computing, Blockchain, IoT - Geographic Information (GIS), Global Positioning Systems (GPS) - Smart City Infrastructures - Supply Chain, Value Chain Management Technologies - Remote Sensing Systems, Sensor Technologies - Wearable Technologies - AI, AR, VR, etc. Technologies 5G Technologies - Mobile Apps - Social Media Applications - Trainings, Simulations	- Rapid Construction Technologies-Earthquake-Speed-Environment - Building Expertise Systems - Innovative Retrofitting Technologies - Field Monitoring/Image Processing Technologies - Building Performance Monitoring Technologies - Seismic Isolation Technologies - Light Construction Materials - Nondestructive Earthquake Resistance Tests - Emergency and Flexible Shelter Technologies	- Health, Medicine, Vaccine, Medical, biotech - Test Kits - Telemedicine / Tele Health - Emergency Support - Disposal of Radiation Damage	- Security, Accessibility, Sustainability, Circularity of Natural Resources - Risk Analysis, Tracking, Evaluation Systems - Energy Efficiency, Clean Energy Systems - Transportation and Storage Systems - Alternative Resource Development Systems - Remote Sensing systems, Precision Agriculture and Sensor Technologies - Developing Policies Establishing Infrastructures, Preparing Plans for "Mitigation and Adoption" - Early Warning Systems - Inclusive Planning Studies - Improving Climate Literacy	- Electricity - Electronics - Machine - Robotics - Mechatronics - Materials science - Drones, UAVs 3D/4D Printing Technologies - Low Carbon Technologies

Image 5. Focus Areas of AFETTEK

TEMA: In line with Target 13.3, TEDU organizes awareness-raising and educational programs for local communities, students, and staff on climate change risks, adaptation, mitigation, and disaster preparedness. The university collaborates with various NGOs such as TEMA Foundation and other civil society organizations on afforestation, climate adaptation, and environmental awareness projects, reinforcing community-based resilience to climate impacts.

BORIS2 - Cross Border Risk: TEDU Civil Engineering Department is a stakeholder of "BORIS2 - Cross Border Risk assessment for increased prevention and preparedness in Europe: way forward" which is funded by the European Commission under the call of the Union Civil Protection Mechanism (UCPM). The aim of the project is to develop a shared methodology for assessing cross-border risk from earthquakes and floods. This project contributes to Target 13.3 of the SDG 13 "and improves education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning".

Projects

AfforesTED: This project aligns with the importance of environmental sustainability by supporting afforestation efforts in collaboration with TEMA. Through the use of

posters containing a QR code directing individuals to the donation page, the project facilitated a more accessible and efficient sapling donation process (See Image 6). The increased participation from both campus residents and community members demonstrates the successful implementation and positive impact of the initiative. By raising awareness on the consequences of urbanization and the value of preserving natural ecosystems, the project encourages individuals to take responsibility for protecting the environment. Overall, this initiative contributes to combating climate change and promotes a greener future for the next generations.

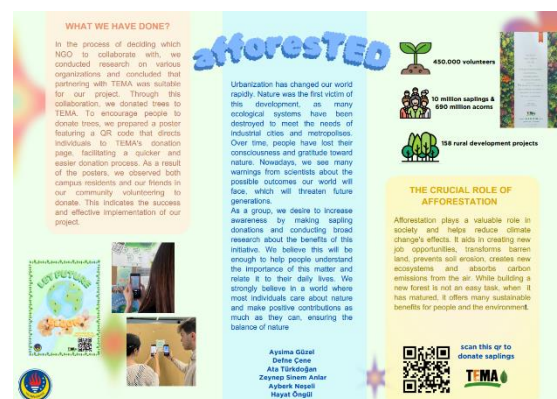


Image 6. AfforesTED

Climate Action: Climate action involves implementing strategies to mitigate climate change and adapt to its impacts, including the use of renewable energy sources and protection of natural ecosystems. As part of this project, a survey was conducted with participants from different age groups to gather insights and raise awareness regarding environmental responsibility. Based on the findings, clear objectives were set to encourage sustainable practices such as reducing greenhouse gas emissions and improving energy efficiency. The project highlights the importance of collaboration among individuals, communities, and governments in order to create measurable and effective outcomes. Ultimately, these efforts contribute to combating climate change and ensuring a safer, more sustainable future for the next generations (See Image 7).





Image 7. Climate Action

GreenNourish: This project aims to reduce the carbon footprint by encouraging individuals to adopt vegan consumption habits and to eliminate prejudices against vegan food (See Image 8). To achieve this, collaboration was established with boutique markets offering environmentally and animal-friendly products. Various vegan food options were presented to participants, and a survey was conducted to measure changes in their perceptions. Additionally, a social media account was launched to increase public awareness. As a result, the project contributed to informing society about the environmental benefits of vegan nutrition.



Image 8. GreenNourish

Artful Solution for the Pollution: This project addresses the global environmental crisis by raising awareness about pollution and the importance of recycling and upcycling. To evaluate public knowledge and behaviors, a survey including six questions was conducted with 88 participants from diverse demographic backgrounds. Bottle caps collected through designated bins on campus were repurposed into an artwork to demonstrate the creative and functional potential of waste materials. The findings revealed insufficient recycling habits and a lack of awareness regarding upcycling, indicating a continued need for environmental education. Overall, this project serves as a model for waste reduction and highlights the significance of transforming waste into valuable resources.

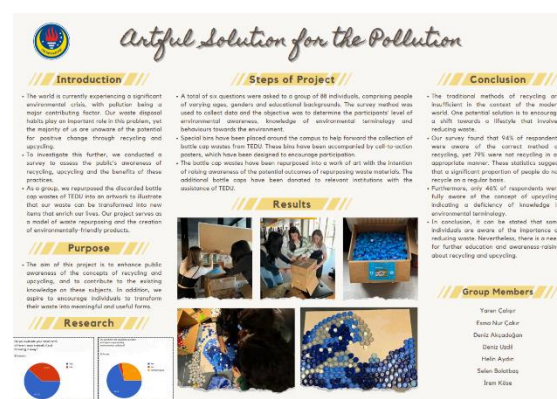


Image 9. Artful Solution for the Pollution

AFETTEK – Disaster and Emergency Technologies Platform Partners and Activities: The Disaster and Emergency Technologies Platform (AFETTEK) was established by a civil initiative aiming to prevent the destructive impacts of disasters and emergencies, and to reduce unavoidable risks. The founding members of the platform include TEDU (General Coordination), AKUT, ASO 1st Organized Industrial Zone, Başkent University, Başkent University – BIYOTEK Center, Bilim Ağacı Foundation, İzmir University of Economics, Koç University, Sabancı University, OSTIM Organized Industrial Zone, OSTIM Medical Industry Cluster, and TEPAV. Currently, the platform brings together 113 legal entities, including universities, research centers, industrial zones, technology hubs, NGOs, clusters,



foundations, and private sector companies. The founders are actively working toward transforming the platform into a foundation in the near future.

AFETTEK Search Conference: One of the initial and significant steps in the establishment process of AFETTEK was the Search Conference. On the first anniversary of this milestone, a panel titled "Disasters Related to Climate, Agriculture, and the Environment and Technologies" was held on March 28, 2024, at Başkent University. The opening speeches were delivered by Prof. Dr. Hakan ÖZKARDEŞ, Acting Rector of Başkent University; Prof. Dr. Mehmet HABERAL, Founder of Başkent University; and Prof. Dr. Ahmet YOZGATLIGİL, Deputy Minister of Industry and Technology. Additionally, the Rector of TEDU, Prof. Dr. İhsan SABUNCUOĞLU, presented the ongoing activities carried out within the AFETTEK Platform (See Image 10).



Image 10. AFETTEK Search Conference

The event received strong interest, with 135 participants from 38 different institutions, representing public authorities, universities, private sector organizations, and NGOs. The panel session, moderated by AFETTEK Platform General Coordinator Ömür DEMİR KIZILARSLAN, featured presentations from Prof. Dr. Mikdat KADIOĞLU (Director of ITU Disaster Management Institute), Çağatay ÇEBİ (FAO Türkiye Emergency and Resilience Program Project Coordinator), and Hanzade SARIÇİÇEK (Deputy Secretary General of the Technology Development Foundation of Türkiye). During the session, the speakers shared their insights and evaluations on climate-related disasters and relevant technological developments.

Campus

TEDU has been informed by the Ministry of Agriculture and Forestry regarding the collaborative initiatives to be carried out within the framework of the "Water Efficiency Strategy Document and Action Plan (2023–2033)" under the Changing Climate Adaptation Framework." (See Image 11). The activities related to the targets outlined in this action plan are jointly monitored and reviewed every six months between the university and the relevant authorities. In accordance with the timeline set forth in the plan, the required documents are prepared and submitted to the Ministry through official correspondence and e-mail.

This collaboration demonstrates the university's alignment with national objectives in the areas of climate change adaptation, water efficiency, and sustainable resource management.



Image 11. Water Efficiency Strategy Document and Action Plan (2023–2033)

Within the framework of climate change adaptation, TEDU actively participates in trainings, symposiums, and workshops organized by official authorities or held on national and international platforms. The purpose of these engagements is to plan, define, and implement joint activities in



collaboration with other institutions and organizations.

Furthermore, TEDU is among the founding representatives of the AFETTEK (Disaster Technologies Platform), which focuses on preparedness for emergencies and potential disasters resulting from climate change. Through this initiative, the university contributes actively to national coordination efforts in disaster management and climate resilience.

These activities reinforce the university's commitment to combating climate change, enhancing disaster preparedness, and supporting sustainable development as a responsible and proactive institution.

Disaster and Emergency Technologies Platform is a platform established by a civil initiative group formed by universities, non-governmental organizations, private sector organizations and associations representing these organizations, with the aim of increasing the economic and social benefits that the private sector can provide and ensuring that technological investments to be made with public coordination are used in the most efficient way.

Completed/ongoing and planned studies to increase efficiency within the framework of adaptation to the changing climate are communicated to the relevant official institutions via e-mail and official letters at certain periods.

Environment Week: The Ministry of Environment, Urbanization and Climate Change organizes Environment Week events every year in Ankara Capital National Garden. These events are not limited to talks, panels and workshops with participants who are experts in their fields and who carry out important studies on environment, zero waste and sustainability. It also stands are set up to exhibit the studies and innovative ideas of civil society organizations, industrialists, municipalities, sector representatives and ministries on environment and zero waste and to interact with the participants. In this context, TEDU participates in these events with its staff and students in order to increase

environmental awareness, contribute to the environment, invest in the future and develop sensitivity towards the environment.



Image 12. Participation to Environment Week

Climate Ambassador Student Representation: As part of TEDU's commitment to promoting sustainability, clean energy awareness, and climate action, a student has been appointed as a Climate Ambassador to actively contribute to institutional sustainability initiatives. The Climate Ambassador serves as a member of the University Sustainability Commission, representing the student community and ensuring that student perspectives are reflected in decision-making processes related to sustainability and energy efficiency. Through this role, TEDU strengthens youth engagement in advancing all of the United Nations Sustainable Development Goals including SDG 13 and fosters a culture of environmental responsibility and climate-conscious leadership among its students.

Evidence:

<https://sustainable.tedu.edu.tr/en/our-team>

TEDU as Provider of Sustainability Reporting Education: TEDU has become one of Türkiye's first accredited sustainability reporting training institutions. In line with the Türkiye Sustainability Reporting Standards (TSRS S1 and TSRS S2) introduced for major companies, the Public Oversight Authority (KGK) accredited TEDU, in cooperation with ANKON, as an authorized provider of sustainability reporting education. With this accreditation, TEDU is among the first six



institutions in Türkiye authorized to deliver sustainability reporting training programs. These programs aim to equip participants with the knowledge and skills necessary to prepare sustainability reports, focusing on key areas such as social responsibility, environmental impact, and economic performance. By enabling professionals to identify and report on sustainability-related risks and opportunities within their organizations, TEDU contributes to the creation of a more sustainable future.

Evidence: <https://www.tedu.edu.tr/en/whats-happening-tedu/tedu-one-turkeys-first-accredited-sustainability-reporting-training>

Within this framework, through its Continuing Education Center (TEDÜSEM), TEDU offers various programs that raise awareness among professionals and the local community about sustainability, energy efficiency, and clean energy. One of these programs, the ESG and Sustainability Workshop, provides comprehensive training on Environmental, Social, and Governance (ESG) principles and their integration into corporate strategies. The course covers global sustainability trends, the Sustainable Development Goals (SDGs), sustainable finance, the circular economy, and the Paris Climate Agreement. Addressing the environmental dimension of ESG including energy efficiency and sustainable resource management, this program enhances participants' understanding of clean energy transitions and fosters the adoption of environmentally responsible practices across sectors.

Evidence: <https://sem.tedu.edu.tr/course/esg-ve-surdurulebilirlik-atolyesi>

