



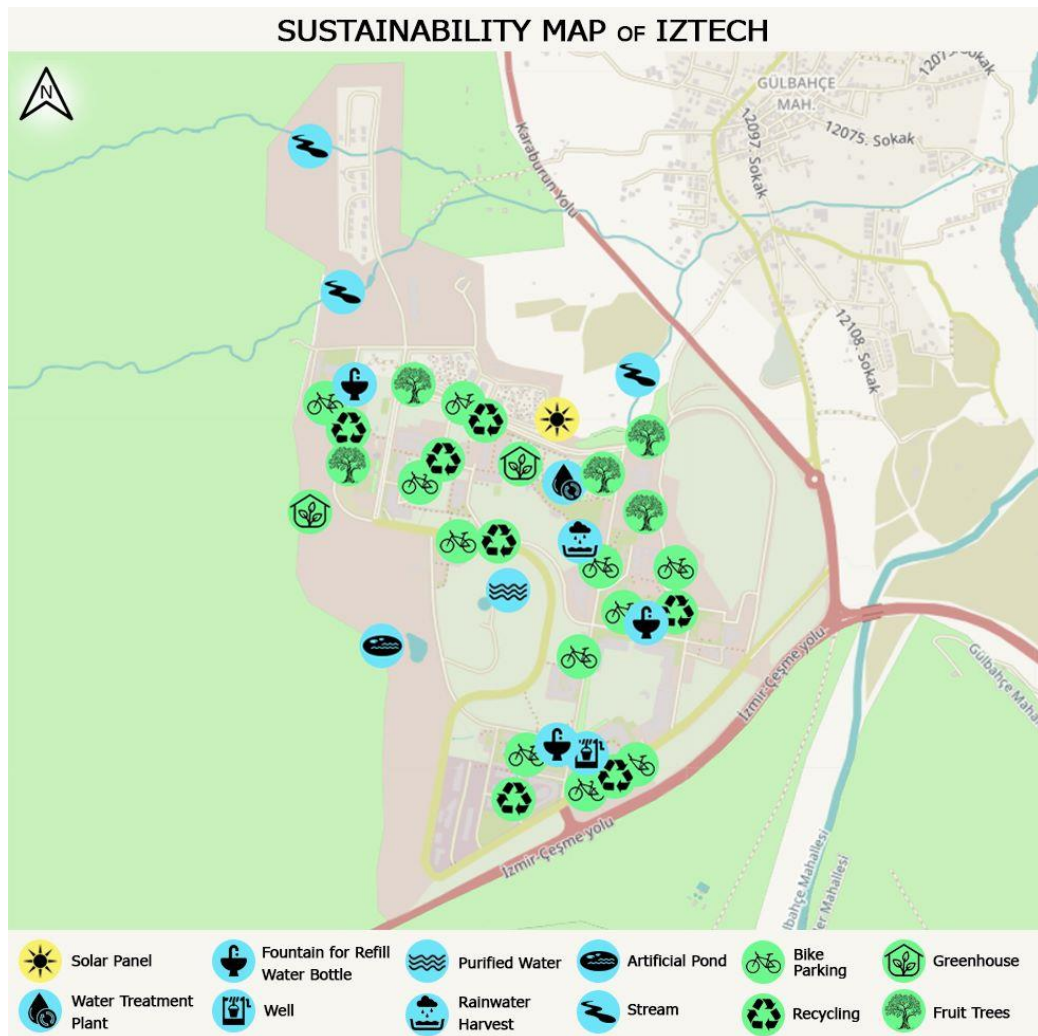
İZMİR INSTITUTE OF TECHNOLOGY
SUSTAINABILITY REPORT
2022

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The report can be found online via:

<https://surdurulebilir.iyte.edu.tr/en/iztech-sustainability-report-2022/>



ABSTRACT

Izmir Institute of Technology (IZTECH) aims at creating a sustainable and resilient campus environment that outreaches the boundaries of the campus in order to serve the in-campus and out-campus communities alike.

In line with this main aim, IZTECH has initiated application to the Greenmetric World University Ranking that was developed by Universitas Indonesia. Therefore, IZTECH has undertaken a gap analysis in terms of its sustainability performance by determining the current situation and the future targets.

There were 6 main topics to investigate and eventually improve: **Setting and Infrastructure, Energy and Climate, Waste, Water, Transportation, Education and Research.**

October 2022 marks IZTECH's third year of application to the Greenmetric Ranking.

- In its first year IZTECH was ranked **217th out of 912 institutions.**
- In its second year, IZTECH was ranked **198th out of 956.**

In order to determine the scopes to develop and improve from each ranking IZTECH endeavors to create a sustainable campus environment. **With a motto of “happy campus, happy peninsula, happy Izmir”, the IZTECH Sustainable Green working group** was set up – consisting of **35 volunteering** academics, employers, researchers, assistants as well as 15 students from the Eco-motion Student initiative - for a sustainable future.

1. INTRODUCTION

Izmir Institute of Technology (IZTECH), a leading unique research institute in **Türkiye (Turkey)**, has strategically embraced the notion of sustainability in its campus located in the rural area - rapidly emerging periphery of Izmir, a multi-linguistic, multi religious harbor city.

Currently, there are ten universities (six public /state universities and four foundation universities) in Izmir. Established in 1992, IZTECH is the third public / state university in Izmir. IZTECH is located in Izmir province on the western coast of Türkiye. Izmir is the third largest metropolitan area of the country as the city inhabits **4.455.294** people by 2022.

The city experiences a rapid increase in population and rate of urbanization. Within the context of Izmir, IZTECH locates in approximately at the geographical center of Izmir Peninsula that lies at the western part of the city. Located in the rural periphery of the city, the campus of IZTECH has a special context compared to other campus universities in the central city.

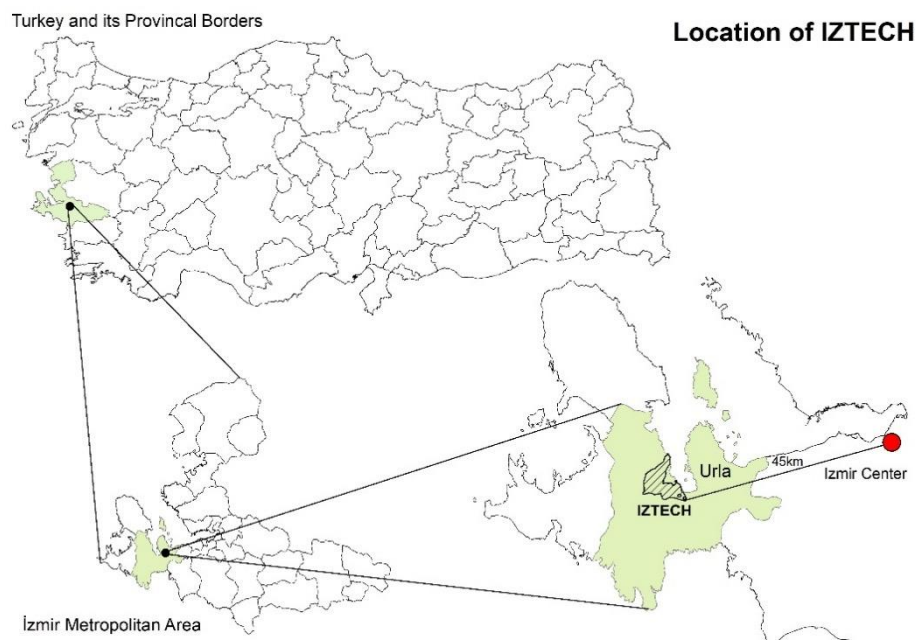


Figure 1. IZTECH location map. (Akpinar et. al., 2021)

IZTECH university campus located in a rural area, establishes a different social and spatial relationship with the city and its immediate surroundings.

The medium of education in IZTECH is English and it covers three Faculties (Science, Architecture and Engineering). The Graduate School gives the opportunity of studies at graduate level in several fields to prospective students. As a leading national research institute, IZTECH has a research ecosystem that is unique for Izmir as the campus area also includes a planned technology development zone, Technopark IZMİR, Innovation Center, Technology Transfer Office, and Research Centers.

In 2014, IZTECH Sustainable Green Campus Coordinatorship was established; a **search-conference for a sustainable living campus** with a motto of **“happy campus”** was conducted by a collective participation from the Campus actors. However, only starting from December 2019, a **Framework on Sustainable Campus** was defined. And, IZTECH has decided to apply the **GreenMetric** for critical self-evaluation and development in the field of sustainability in 2020, and continued to apply in 2021, as well. **With a motto of “happy campus, happy peninsula, happy Izmir”**, the **IZTECH Sustainable Green working group** was set up – it consists of **35 volunteering** academics, personnels, researchers, assistants as well as 15 students from the Eco-motion Student initiative.

Contributing to the development and transformation of the urban and rural character and public services in its immediate surrounding, IZTECH campus, which stands out with its rural features, is taking steps towards becoming a sustainable and green campus. However, due to its peripheral location, the educational processes and the campus space have been deeply affected by the pandemic. In this regard, a need for an assessment that takes into account the effects of the pandemic had emerged for the IZTECH campus. Following the peak-days / haydays of the Covid Pandemic, the education as well as activities have become hybrid, and continuously physical – which necessitated a new self-evaluation for the interior and exterior spaces to face new conditions and dynamics in the campus.

Following our first application to UI GreenMetric World University Rankings (*GreenMetric*) in 2020, IZTECH has set up first of all, a strategical plan for the institutionalization of the system as well as the road map. Currently, the Strategic Plan of IZTECH weakly addresses the concept of sustainability. The research team on the sustainability of the institution has argued that the conceptual framework of sustainability is far from being completed. In this framework, an ethical policy document had been initiated by the university administration. The document collectively prepared by internal actors of the university covers its institutional positioning vis-à-vis the sustainability of IZTECH. The policy text covering our meeting with nature has been discussed and written, and officially approved by the University Senate in October 12th 2021. As part of this institutionalization process, the mission as well vision of the coordinatorship have been established based on this policy text.

Secondly, IZTECH has applied to the Higher Education Council (YÖK) for the establishment of a research center in the Academic year 2021-2022. The rejection was received as the coordinatorship didn't have regular income from international / European union research projects. Based on the justification, the IZTECH Sustainable Green Campus working group shas been applying to a large number of calls by the European Union research axes on energy, sustainability theme. Along with the Institute, the team has succeeded to receive three international EU projects. And, therefore, the coordinatorship is going to re-submit the application for a **Research Centre on Sustainability**.

Alongside the structural steps towards the institutionalization of sustainability at IZTECH, student initiatives focusing on sustainability and environmental issues also exist within the campus.

Table 1. Our Positions in terms of sustainability. (Akpınar, I., et, all, 2021)

Theme	Our Positions
Three Pillars of Sustainability	IZTECH adopts economic, social and ecological sustainability as the basic principle in terms of education, research and benefit to society, and strives to ensure that all assets in the IZTECH campus exist in a sustainable environment.
Sustainable Development	Starting from its own campus and its immediate surroundings, IZTECH considers it a duty to contribute to the development of individuals who care about sustainable future of the planet and are aware of the threat to society and environment, and to raise awareness on this issue.
Use of Resources	IZTECH monitors and archives resource usage values, shares them regularly with campus stakeholders and the public, and takes the necessary measures for the continuous improvement.
Education-Research Ecosystem	IZTECH redefines its campus as a sustainable, living and nature-friendly “education-research ecosystem” that considers the sustainability of natural and cultural assets. It adopts the principle that all components in this ecosystem are equal.
Governance	IZTECH is determined to develop its corporate governance, corporate culture and organizational capacity with a participatory structure and to ensure quality of life in the campus.
Vision	IZTECH continues its activities with the vision of a global sustainable future by improving its institutional and cooperative infrastructure on a national and international scale, through its campus, its immediate surroundings and the city of Izmir.

IZTECH has discussed how the pandemic affected the daily routines of the campus users, together with the ways they commute, use campus outdoor public spaces and indoor working spaces. A critical review of sustainability issues through questionnaire technique applied to the IZTECH campus users, including administrative and academic staff, and students at IZTECH. The multidimensional survey has been designed to strengthen the understanding of the socio-spatial and educational characteristics of IZTECH, to grasp the perspectives of the campus users on the sustainability performance of the campus, and to gather some intangible data on the Covid-19 period and its impacts on the use of campus spaces (Akpınar, et, all, 2021).

In the light of the answers of participants and a critical evaluation of the previous application, our sustainability team (academics, young researchers, graduate students) have led the below-mentioned axes of GM and executed small-medium scale transformations and implementation at IZTECH campus.

- Along with this transformation, the existing Strategic Plan has been challenged and a new team has been established for the setting up of a new Strategic Plan in 2023 at IZTECH.
- IZTECH sustainability team has become an active part of the University sustainability collective amongst Izmir 10 Universities. The member universities, impressed by our achievements at Green Metric, are going to visit the campus, and physically experience the site and the results of works on sustainability in November 2022.
- IZTECH sustainability team has become an active board member of the Sustainable Network of cities in Türkiye.
- Along with the Institute achievements, IZTECH sustainability team has succeeded to receive three EU research projects in 2022.
- Along with this preparation, IZTECH has applied for the national accreditation, and the online interrogation was set up on October 2022. A physical panel meeting is going to be organized in 7 to 9 of November, 2023 – where sustainable campus (infrastructure, research, education) is going to be one of the main steam-line for self-evaluation of the Institute.

2. SETTING AND INFRASTRUCTURE

The IZTECH campus is located in a large area blended with forests, plants, vegetable gardens, greenhouses and a large number of animals. Our campus has rather low portion of buildings which allows a sustainable campus life and good quality of air. 45% of the total campus area is a forest and the biodiversity in our forests are studied and recorded systematically.

The campus contains a planted vegetation area over 10% to the total area. We planted 20.000 trees in the last 2 years. Recycled/filtered water for plants allow us to grow the vegetation area without increasing the water consumption. The water absorption is taken in consideration while building open areas, pedestrian ways and even roofs. Natural stones are used instead of concrete or asphalt in all pedestrian areas.

We have greenhouses in our campus which are used for academic activities in a large perspective. This is a long-term vision of our university and being actively used. In addition, bio-diversity in the forests of our campus has been investigated for academic purposes (Deniz Gerçek's BAB fund). In this framework, Doganlar/Frary lab at IZTECH, a new type of cotton was developed. The new cotton species has higher efficiency and quality when compared to the conventional cotton plant. Moreover, Doganlar/Frary lab aimed at determining if the expression of a Bt cry gene in tomato could provide control of the leaf miner *Tuta absoluta*. This insect was initially only a threat to crops in South America but within the past decade it has spread to Europe and Africa where it has earned the nickname 'tomato Ebola.' Control of this pest is especially difficult in developing countries which may not have access to insecticides or may not be able to afford the repeated sprays that are needed to eliminate leaf miner. In our research, the cry1Ac gene was introduced into tomato plants. The transgenic plants were then examined for their response to leaf miner infection. Up to 100% of leaf miner larvae died after feeding on leaves producing crystal proteins.

Almost 100 homeless dogs are living in our campus and fed by the university. We established a system which produces dog feed out of the rest food from the cafeteria and restaurants within the campus. The dogs are fed daily and vaccinated, when necessary, as well.

IZTECH has a total budget of 17.165.789 USD for the last 12 months and over 15% of this budget was spent for the sustainability purposes. The sustainability budget mainly focused on sustainable research/education, water recycling, accessible campus as well as CO₂ emission reduction in transportation and lighting:

- Staff services for mass transportation are organized by the university to reduce the CO₂ emission by reducing the number of private vehicles.
- The fuel and maintenance of the buses are covered by the university.
- For a sustainable education life of the students, Daily meal expenses are supported by the university as well.
- The campus infrastructure and facilities are continuously improved for a better accessibility.
- Since the campus is in a rural area, both graduate and undergraduate students might have accommodation problems. Therefore, dormitory construction is performed continuously in the campus.

- Students might need study rooms when they must study in extensive periods, these study rooms are constructed at the university which are open till midnight.
- The buildings are improved for a better heat isolation.
- University activities are conducted for kids to assure a sustainable education life in the future.
- Students coming from low-income families are supported for accommodation, daily food needs and health.

The buildings in our campus are accessible with either ramps or lifts in the outside of the buildings. Each building has an elevator and accessible toilets. We have 3 campus entrances which are controlled by the security staff as well as the cameras. In addition, entrance of each building in the campus as well as some parts of the campus are recorded by the security cameras. Every building has a fire alarm system, several fire extinguishers in every floor, an integrated fire hydrant through the walls as well as a large fire hydrant outside of the buildings.

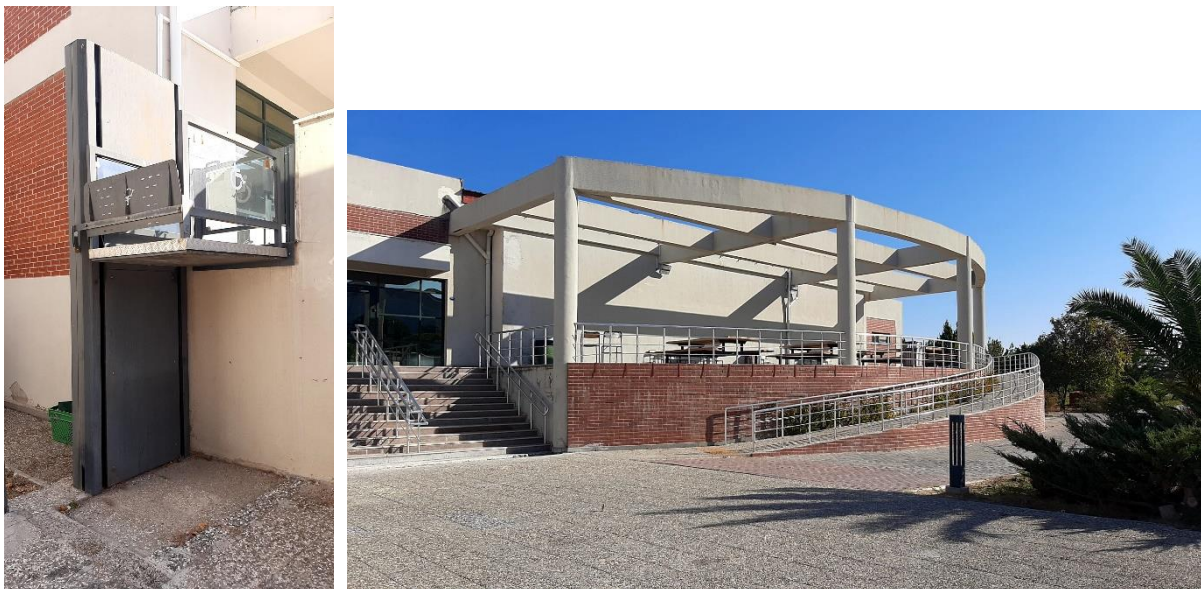


Figure 2. Examples of a lift and ramp designed for a better accessibility.

A Health infrastructure in our campus is available. We have a clinic in the campus with first aid, emergency room, and certified health personnel including nurses and medical doctors. The clinic has capability to perform dental examination and treatment, vaccination, emergency service and laboratory. The main nursing services are given below:

Patient admission and registration

Preparation of monthly statistics of health services

First aid services (IV, ECG, wound dressing...)

Supervision of dental operations, sterilization, and disinfection

Vaccination monitoring and administration

Tracking vital signs (body temperature, blood pressure, pulse, breathing rate)

Health supervision of cafeterias and canteens

Emergency response services

In emergencies, first response to the victim is performed by physicians and nurses.

If necessary, the patient is referred to our Health Centre or the nearest health care facility.

3. ENERGY AND CLIMATE

IZTECH works for the improvement in energy efficiency, production of renewable energy and energy consumption reduction thus decreasing greenhouse gas emissions. At the IZTECH campus, energy efficient appliances are installed in the buildings such as LED light bulbs, light bulbs with motion sensor, energy efficient air conditioner systems, etc. Most of the buildings has natural lighting and ventilation. Solar panels and a wind turbine have been built in the campus to contribute on the renewable energy generation and decrease the CO2 emission.



Figure 3. Examples of natural lighting in our buildings.

Most of the buildings have the natural daylight design as well as natural ventilation. The Gulbahce region has a very high sunshine duration during the year. Greenhouse gas emission reduction is considered from different scopes such as e-vehicles managed by the university, free bicycles in the campus, waste sorting bins (metal, plastic, paper, glass, batteries and rest), wastewater treatment and usage, renewable energy sources (wind and solar) and drinkable water fountains.

During Covid-19 pandemic, IZTECH conducted several research activities to contribute the academy by different innovative programs.

IZTECH has undertaken the tasks of developing an identification and quantification kit for viral loads in the environment and humans. Several trials have been conducted in IZTECH labs and successful results were obtained.

- IZTECH conducts research on the production of COVID-19 vaccine candidate via *Nicotiana benthamiana* transient expression system. Within the project, producing recombinant COVID-19 antigens in *N. benthamiana* using a transient expression system

was aimed, which could be used for development of vaccine and diagnostic test kits. We target production of different variants of recombinant S glycoprotein and N protein in our production system.

- Another project works on the “in silico analysis of phytochemicals for use in COVID-19 treatment and in vitro testing of potential drug candidates”. Phytochemicals obtained from the plant databases are subjected to molecular docking studies to assess their anti-viral and anti-inflammatory activity.
- Furthermore, in the light of the necessity of mobility for human health, especially for the elderly, the ‘Next generation implants for everyone’ project at IZTECH established the gait analysis lab of the Aegean region at IZTECH. Through this lab, Turkey's first walking database and movement data of daily activities are collected. The database will also be put into service for use in biomechanical modelling over the web. Through this laboratory, people with gait disorders and musculoskeletal disorders will be able to be diagnosed. Lastly, a face shield to help healthcare professionals was produced via 3D printers. First products are used by the IZTECH emergency response team.

A Conceptual model of the Gülbahçe geothermal system, Western Anatolia, Turkey was developed based on structural and hydrogeochemical data. This data established the base for the study which examines the heating of İzmir Institute of Technology with geothermal energy. In this context, the potential of the geothermal license area was evaluated, and the heating need of the university area was calculated. The heating system was designed in the university area and the material lists were prepared and a feasibility report was prepared by the experts that work in GMK Energy.

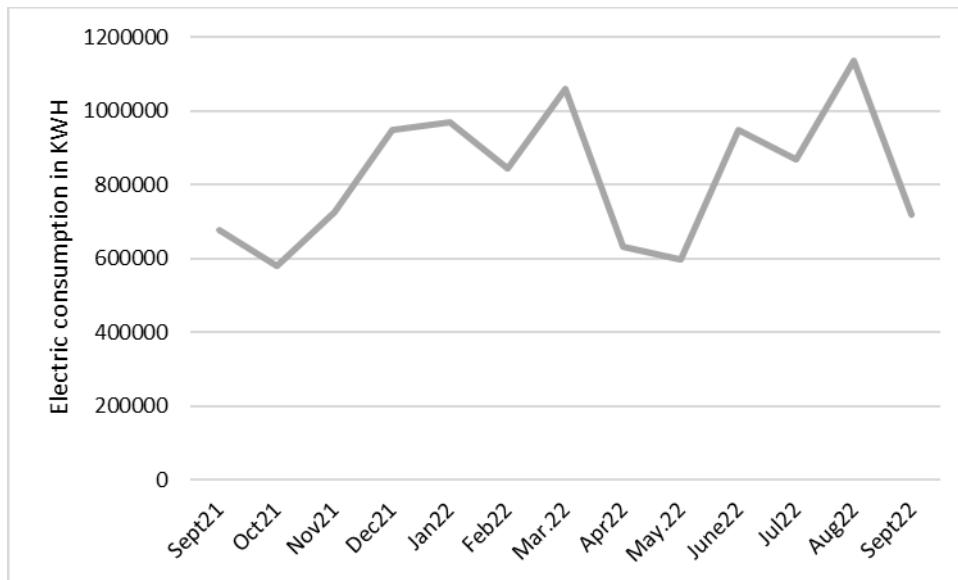


Figure 4. Electricity consumption of IZTECH campus in last 12 months

4. WASTE

Performance of IZTECH at waste management was evaluated according to the data collected on several aspects: (1) rate of recycling program applied to university waste, (2) number of programs to reduce the use of paper and plastic on campus, (3) rate of organic waste treatment, (4) rate of inorganic waste treatment, (5) rate of toxic waste treatment, and (6) the means of sewage disposal.

4.1. Recycling Program:

In Turkey, the Zero Waste Project (<http://zerowaste.gov.tr>) is in effect. Izmir Institute of Technology is bound by law to give all of the recyclable wastes generated on premises to a designated recycling company, Ada Recycling Company. IZTECH implemented a system that informs everyone on campus about what is recyclable and what is not. The Waste Commission of IZTECH is responsible for structuring the rules and execute the collection of specific waste (Electronic Waste, batteries, and ink-cartridges from printers. E-waste items are collected separately and not disposed of in regular trash bins) (Figure 5).



Figure 5. Recycling Program for IZTECH, Turkey

4.2. Reduction of Paper and Plastic On Campus:

IZTECH has implemented and participated in the following efforts in order to reduce the paper and plastic use on campus:

- a. IZTECH, being a state university, is currently using the Electronic Document Management System, that has been established by all state offices by the government decree, thereby reducing paper use.
- b. IZTECH is bound by law to establish the “Zero Waste Project” on campus.
- c. IZTECH has built several drinking water fountains on campus to provide free drinking water for all, hence reducing the consumption of plastic bottles.

- d. IZTECH has distributed glass water bottles to reduce single-use plastics.
- e. Reuse of plastic bags is also encouraged on campus as a part of the nation-wide initiative. Within the initiative the previously free single-use plastic bags are sold at 0.25 TRY/bag. Also, IZTECH produces shopping bags from waste textile and sells them to raise money to give as scholarship.

4.3. Organic Waste Treatment:

In IZTECH, organic waste is produced at canteens and cafeterias of varying capacity. All of the organic waste produced on campus is collected by Izmir Metropolitan Municipality's garbage trucks and is transported to a transfer station and then to Harmandalı Landfill Area, where it is landfilled according to health and safety regulations. The Harmandalı Landfill Area, where a biogas production facility is also managed by Izmir Metropolitan Municipality. ([https://www.izmir.bel.tr/tr/AtikKabuluVeBertarafUcretleri\(harmandaliDuzenliKatiAtikDepolamaAlani\)/46/91](https://www.izmir.bel.tr/tr/AtikKabuluVeBertarafUcretleri(harmandaliDuzenliKatiAtikDepolamaAlani)/46/91)) IZTECH is bound by national legislations to give its organic waste to the municipality so that it can be disposed safely and according to the national law (Figure 6).



Figure 6. Organic Waste Treatment at IZTECH, Turkey

4.4. Inorganic Waste Treatment:

Inorganic waste treatment is managed at IZTECH in cooperation with the Izmir Metropolitan Municipality. IZTECH is bound by the Solid Waste Directive in effect in Turkey. Therefore, IZTECH is bound by law to give all its inorganic waste to the garbage trucks of Izmir Metropolitan Municipality. As mentioned above, the Waste Commission of IZTECH is responsible for collecting Electronic Waste, batteries, and ink-cartridges from printers. E-waste items are collected separately and not disposed of in regular trash bins (Figure 7).



Figure 7. Inorganic Waste Treatment at IZTECH, Turkey.

4.5. Toxic Waste Treatment:

Hazardous/toxic waste management is managed by the Waste Commission at IZTECH. Every lab at IZTECH has one person assigned to inform the lab staff and students on how to manage toxic/hazardous waste within the lab. Wastes are collected in temporary storage rooms in the buildings. Every year, the Waste Commission collects the data on the type and amount of the

waste before getting quotes from licensed waste transport and disposal companies. Once the data are collected, the company that gives the best service and economic quote is contacted to visit the campus to collect all hazardous/toxic waste. Also every three years the fuel tanks are also cleaned to remove the toxic fuel waste, for which the data is entered to a national database and the collected waste is sent to licensed incineration facilities (Figure 8).



Figure 8. Toxic waste management at IZTECH, Türkiye.

4.6. Sewage Disposal:

Sewage is collected through closed pipes at IZTECH campus and it flows towards the IZTECH Wastewater Treatment Plant, that is managed and operated by İzmir Metropolitan Municipality (İzMM) Water Directorate abiding the sanitary rules and regulations. The wastewater treatment plant is designed to treat 2000 m³/day flow rate and the treatment is done by an activated sludge system. Previously, treated water did not meet the national standards for irrigation. Therefore, IZTECH Rectorate has contacted İzMM Water Directorate officially in 2020, in order to implement a disinfection unit on the effluent stream, producing treated water that is suitable for irrigation use. Following the disinfection unit's implementation in 2020, treated wastewater from the wastewater treatment plant is pumped to a storage unit in IZTECH campus at higher elevation and is

used for irrigation of all green areas on campus. Since the wastewater is treated to be used for irrigation, it can be concluded that the wastewater is downcycled.

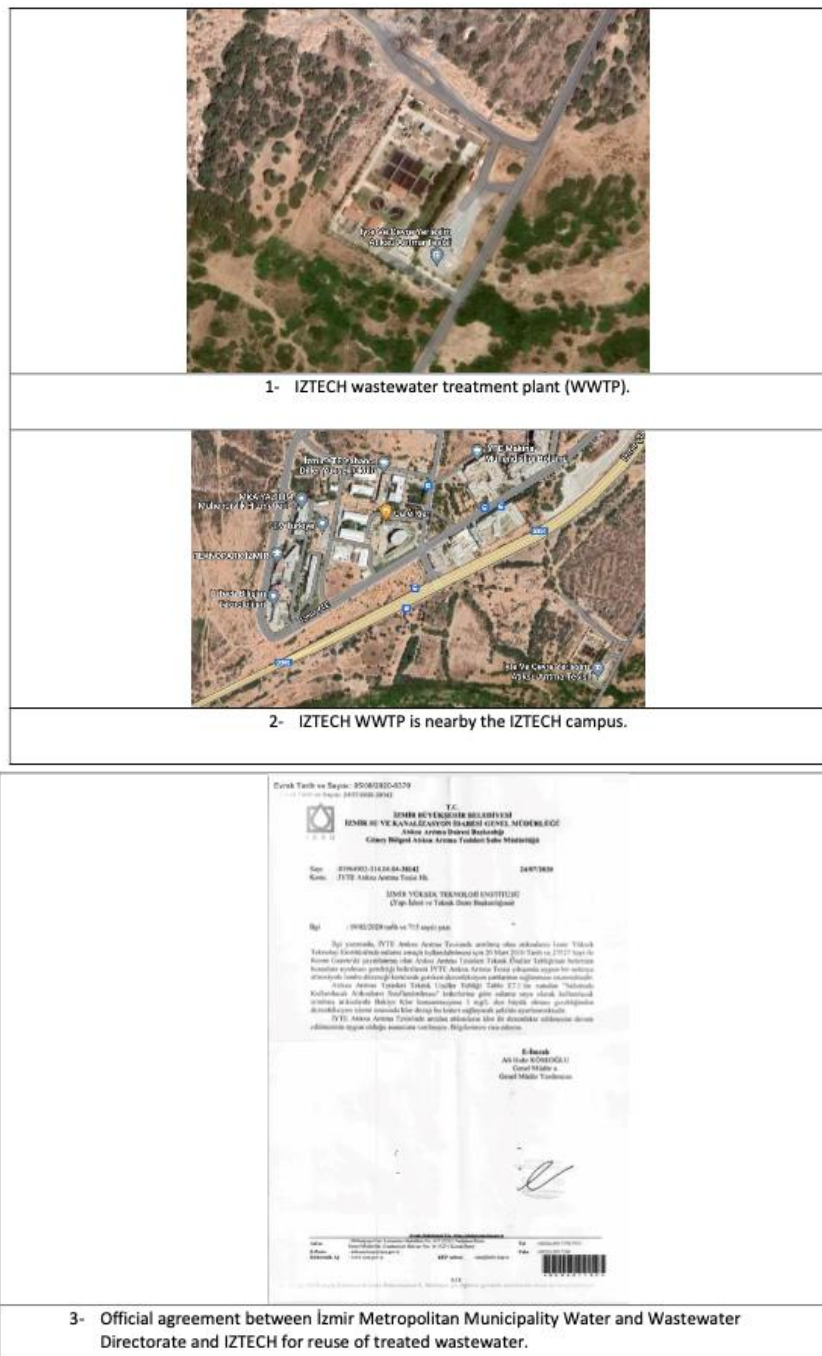


Figure 9. Sewage treatment and reuse at IZTECH, Turkey.

5. WATER

Water conservation and water recycling/reuse are two main topics IZTECH has undertaken in order to tackle the water scarcity problem in the region. The water axis has been a critically focus and improved domain in terms of research, education, and execution/implementation at the IZTECH campus. As a leading research university in Turkey, IZTECH commits to become an exemplary community and to conduct educational outreach activities on the topics of water conservation, efficiency, and recycling.

5.1. Water Conservation Program:

Water conservation projects have been extensively studied in the last years at IZTECH campus since the Aegean region and particularly the province of Izmir is under severe water stress. We have a natural surface runoff pool that is being rehabilitated for use in plant watering at IZTECH campus. Also another previously unused area in the campus is restored to form a creek, preventing occasional water flooding at nearby buildings and directing the water to olive trees. Rainwater harvesting project is designed by the students and academics together and in collaboration with Izmir Metropolitan Municipality and the Rotary Club the project was realized. Furthermore, the “Water Route” project was continued by our IZTECH faculty members to raise awareness about drought in order to improve the water culture in Turkey. Problems caused by drought can be solved by protecting groundwater resources. The awareness project named 'Water Route', prepared by IZTECH to draw attention to drought, aims to develop water culture in Turkey (Figure 10).

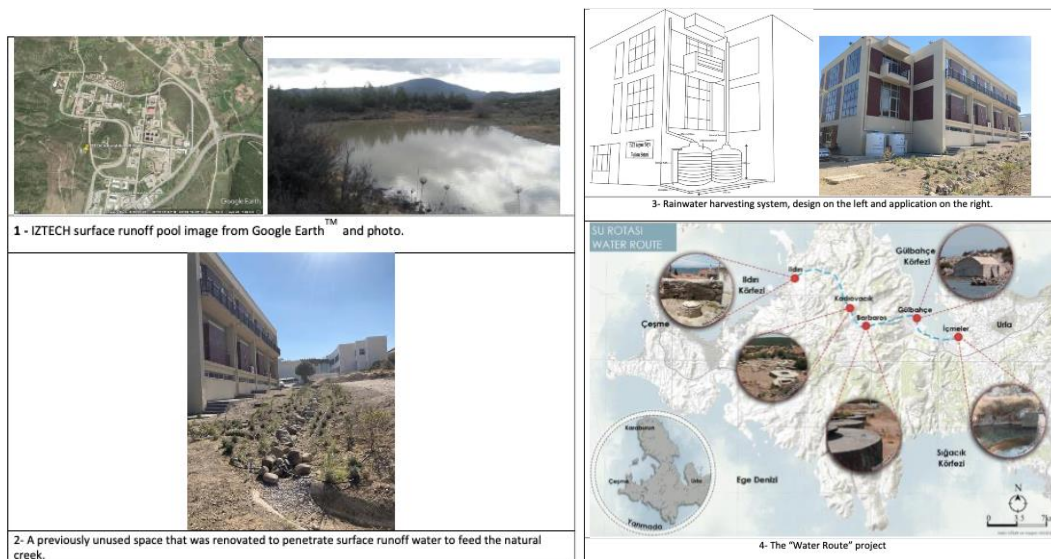


Figure 10. Water conservation at IZTECH campus, Turkey.

5.2. Water Recycling Program:

Official correspondence between IZTECH and Izmir Water and Wastewater Directorate ensured treated water to be supplied to IZTECH campus on demand from a nearby wastewater treatment plant. A disinfection unit had to be implemented to the end of the wastewater treatment plant's flow scheme, so that the national regulations were met. Correspondence regarding the implementation of the disinfection unit was led to production of irrigation quality water. In 2021, 235680 m³ water was consumed at IZTECH campus. The red squares

shown on the graph represents the water consumption in months May, June, July, August, September and October 2021. During these months watering of green areas and trees on campus was done on a daily basis since there was a prolonged dry season with minimal rainfall. Considering the plant was able to provide 2000 m³ of water on a daily basis, approximately 64.5% of water was recycled (Figure 11).

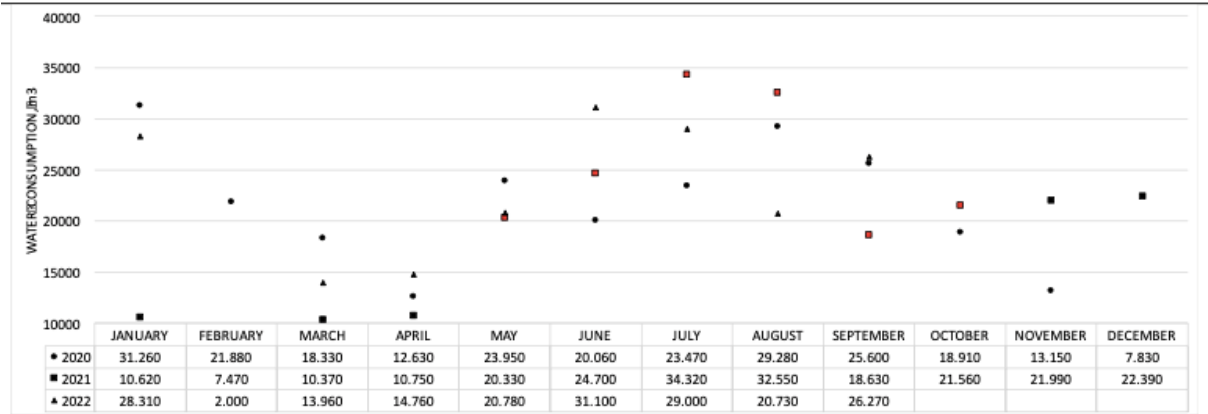


Figure 11. Monthly water consumption for years 2020 to 2022 on IZTECH campus

5.3. Water Efficient Appliances:

Motion-activated hand washing taps were installed throughout the campus in order to reduce water consumption (Table 1). The data were retrieved from the Construction Works Directorate of IZTECH.

Table 2. Motion activated water faucets.

Appliance	Total Number	Total number water Efficient appliances	Percentage
Taps	712	366	51.4 %
		Average Percentage	51.4 %

5.4. Consumption of Treated Water:

Treated water is consumed for plant and tree watering on IZTECH campus. In order to ensure a health reuse that abides with the national regulations, a much-needed disinfection unit was implemented as a result of official correspondence between IZTECH and Izmir Water and Sewerage Directorate. The red squares shown on the graph represents the water consumption in months May, June, July, August, September and October 2021. During these months watering of green areas and trees on campus was done on a daily basis since there was a prolonged dry season with minimal rainfall. The IZTECH wastewater treatment plant can produce 2000 m³/day treated water. During the irrigation season, we calculated that approximately 152090 m³ of water was recycled, which corresponds to approximately 64.5% of the total annual water consumption (235680 m³ for the year 2021).

5.5. Water Pollution Control in Campus Area:

Policy

IZTECH has identified actions towards mitigation and adaptation to climate change as its priority. Thus, projects on water conservation have gained impetus in recent years. Since IZTECH does not have direct or indirect discharge to any nearby water body, it prevents pollution by default.

In its 2019-2023 Strategic Plan IZTECH has identified sustainability as an important target and put in hard efforts to realize that target by:

- Decreasing plastic use by distributing glass water bottles and building water fountains throughout the campus.
- Decreasing paper use by encouraging two-sided printing and shifting to Electronic Document Management System.
- Increasing water conservation by increasing permeable surfaces, renovating surface runoff regions in campus and building a rain harvesting system.
- Supporting academic staff on grant applications on climate change.

Wastewater Treatment ^[1]_[SEP]

Sewage is collected through closed pipes at IZTECH campus, and it flows towards the IZTECH Wastewater Treatment Plant, that is managed and operated by İzmir Metropolitan Municipality (İzMM) Water and Wastewater Directorate abiding the sanitary rules and regulations. The wastewater treatment plant is designed to treat 2000 m³/day flow rate and the treatment is done by an activated sludge system. Previously, treated water did not meet the national standards for irrigation. Therefore, IZTECH Rectorate has contacted İzMM Water and Wastewater Directorate officially in 2020, in order to implement a disinfection unit on the effluent stream, producing treated water that is suitable for irrigation use. Following the disinfection unit's implementation in 2020, treated wastewater from the wastewater treatment plant is pumped to a storage unit in IZTECH campus at higher elevation and is used for irrigation of all green areas on campus. ^[1]_[SEP]

Guideline standard ^[1]_[SEP]

IZTECH is bound by national law regarding its discharges to closed channels. The Water Pollution Control Regulation has been put in effect in 2004 (Official Gazette 25687: ^[1]_[SEP] <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=7221&MevzuatTur=7&MevzuatTertip=5>) . The regulation aims to protect the potential of water resources, prevent water pollution and to determine the technical and legal aspects in water management for sustainable development.

Monitoring and Evaluation

According to the Regulation mentioned above, the legal authorities conduct monitoring in 6-month intervals on random samples collected from manholes.

6. TRANSPORTATION

In IZTECH campus, the close locations of buildings such as the library, sports centre, swimming pool, shopping mall, and central cafeteria provide an efficient distance for sustainable transportation modes like walking and biking. All sidewalks are separated from the carriageway by elevation for pedestrian safety. Additionally, elevated sidewalks are equipped with guiding blocks and ramps to provide access for disabled people and are lighted for security. Maintenance and repair work of sidewalks and pedestrian paths are done regularly. The roads on IZTECH Campus are designed for safe traffic. Bicycles and vehicles are sharing the same platform and the speed limit on the campus is 30 km/h. The elevated crosswalks serve as speed ramps (traffic calming) on campus streets and provide easy access for physically disabled persons.

In 2019, the Ministry of Health donated 59 bicycles to IZTECH Cycling Community, and these bicycles can be used free of charge in the campus area. Also, there are bike-sharing systems and shared e-scooter services on the campus that serve to users at very little charge. On campus, secure bicycle parking facilities are located nearby to the buildings.

University is providing a free shuttle for the trips in the campus (a ring service) every 30 minutes, and the shuttle extends its route four times a day (once in the morning, twice at midday, and once in the evenings) to the nearest settlement, Gulbahce, where most of the students live. The shuttle has 50 passenger capacity (with 27 seats) and everyone on the campus (staff, students, or visitors) can take the shuttle for free. The route and schedule of the shuttle can be reached on the university website.





Secure Parking Facilities for Bicycles



Campus Shuttle



Bicycles of Unibike Bike Sharing System	E-Scooters Operating in The Campus Area
	
Electric Vehicles Owned by The Uni	Electric Public Busses Serving to The Campus

Every year a protocol is signed between a transportation company and the University for transporting campus members (students & staff) for free from twelve different locations of the city, İzmir, to the university in the morning and reverse direction in the afternoon. In addition, there is a night bus service (20:00 Bus Service) for staff and students who work after hours. The bus is operated by the university rectorate and one can take the bus with online daily registration from the university webpage free of charge. These campus bus services correspond to more than a 30% reduction in private car usage on campus. There is a strong public bus transit service in the city of İzmir, which is operated by İzmir Metropolitan Municipality. There are 3 regular bus lines (882, 883, and 982) serving to IZTECH campus, and timetables and the schedules of these bus lines can be followed by smartphone applications. These lines are also interconnected with other bus lines and transportation modes. By mutual agreement between the university rectorate and İzmir Metropolitan Municipality (IMM), electric buses have started to serve the campus location, regularly. The use of an environmentally friendly public transit system will decrease the carbon footprint around campus.

The university rectorate added two electric minivans and two e-bikes to its fleet. The minivans are used for routine freight transportation on the campus and the e-bikes are used by personnel of the department of construction works. In near future, the university rectorate is planning to buy an electric bus that will be used as a shuttle bus to decrease CO2 emissions.

Existing shuttle buses, campus bus services, and bike-sharing systems are the main transportation policy tools to limit the number of motor vehicles on campus and play an important role in carbon emission reduction.

7. EDUCATION AND RESEARCH

As a leading national research institute, IZTECH aims to integrate principles of sustainability into its pioneering research and education. In IZTECH, the total number of courses offered, including graduate and undergraduate degrees, are 1293. Among them, 195 courses are related to sustainability. These courses are offered in engineering, natural sciences, and architecture faculties. In recent years, there have been efforts to offer sustainability related courses common to whole students in IZTECH. For example, the course of “Global Sustainable Development” offered by the department of Chemical Engineering for the last three years is open to all students

IZTECH has a research ecosystem that is unique for Izmir as the campus area also includes a planned technology development zone, Technopark IZMİR, Innovation Center, Technology Transfer Office, and Research Centers. Also, the bureaucratic processes continue to open a research center titled “Center for Sustainability and Resiliency”. These research departments and individual researchers/faculty members have been conducting research funded by different institutions such as EU, The Scientific and Technological Research Council of Turkey and Scientific Research Projects funded by IZTECH. In 2022, total research funds are calculated as 7 274 423 USD, while the total research funds dedicated to sustainability research are calculated as 5 427 008 USD. Already representing a majority in the overall research, research funded dedicated to sustainability is expected to increase in the next years. In the last three years, total of 258 articles were published on the issues of sustainability which makes average of 86 publications per annum.

It is important to mention the sustainability related events, student organizations, cultural activities existing in the campus to explain social dimension of sustainability in IZTECH. The total number of events related to environment and sustainability issues which were hosted or organized by different departments, units, and members of the University in the academic year 2019-2021 is 116. These events include conferences, workshops, awareness raising and practical trainings. While this number is 48 in 2019, it is 36 in 2020 and 32 in 2021 respectively even though the uncertain environment caused by the pandemic. This increase is partly related to increased attention towards sustainability issues because of the pandemic. Additionally, student initiatives focusing on sustainability and environmental issues also exist within the campus.

In terms of student organization at IZTECH campus, there are approximately 40 student organizations dealing with sustainability in different areas.

Examples: Permaculture and Ecological Living Community, Environment and Young TEMA Community, ECO-Motion Community, Natural Research Community. Concerning cultural activities, Women in Business, etc.

There is a website titled “Sustainable Green Campus” which was established on 2020 (<https://surdurulebilir.iyte.edu.tr/en/>). The website is regularly updated and designed to include announcements of sustainability related events, projects, student organizations and news. Also, the website is connected to collection of publication and these related to sustainability under IZTECH Library Catalogue.

IZTECH get the 3rd rank among the state universities in Turkey that was found successful in transition to distant education. Trainings were given to both students and faculty members to ease the transition process to distant and online learning systems. Microsoft Teams that offer classrooms and meeting spaces was adopted. An online classroom was established to be used by faculty members to record their lectures. More than 1000 lectures were recorded by using Microsoft Teams and Adobe Connect. Tablet computers were distributed to support faculty members and students to continue education by online means. Apart from that, sanitation related measures (i.e. signs and mask/disinfection stands) were adopted all around the campus.

IZTECH is home to 18 of sustainability-related startups. The number is expected to increase in the coming years. To initiate this, IZTECH has become a part of scheme that funds innovate start-ups. The call for this year supports startups that are in line with Green Growth approach (<https://biggsinerji.com/>)

8. REFERENCES

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