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WASTEWATER IN JAPAN TEXTILE & SUSTAINABILITY **GREENHOUSE** ECOLOGY **GLOBAL WARMING** ISTANBUL AIRPORT IGA INTERVIEW **INTERVIEW WITH POLAT ENERGY**



21

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VISION

Dergi21 is a publication that addresses the concept of sustainability, which is one of the most important global agendas of the 21st century, with its structures that brings together various sectors.

MISSION

Sustainability is a reality where everyone can make significant impacts through small changes. Dergi21 is an objective magazine that approaches the concept of sustainability with a realistic perspective from everyday life, addressing current issues, approaches to these problems, and genuinely effective problems.

WHO ARE WE?

We are university students who aim to convey the globally crucial topic of sustainability to everyone without sectoral limitations. This magazine, with a priority for Marmara University students, embraces the collaborative efforts of all disciplines without discrimination.

It is a publication prepared as a result of the collective work of many branches of science, such as Engineering, Law, Business, Social Sciences, Natural Sciences, Architecture, and Art. This magazine community consists of students who want to highlight the importance of the concept of sustainability, feature global news, and discuss current technologies and the significance of sustainability.



PREFACE

Sustainability is a concept that is familiar to most people, yet not one that many would have thought deeply about. Waiting until 2030 and 2050 for it to draw attention wouldn't be accurate. As long as we humans live, we leave behind many irreversible marks such as carbon footprints, emissions, waste production, and resource consumption. Is it really possible to reduce or limit this footprint? Can a single person impact the future?

Dergi21 begins with the belief that not only environmental sustainability but also social and economic sustainability are possible. It aims to raise awareness about sustainable living models. The magazine strives to be a collection of articles that will capture everyone's interest by discussing current news, issues, and potential solutions.

Through interviews with experts who have proven themselves in various fields, information obtained from reliable resources, and an objective perspective on contemporary issues, Dergi21 is a carefully curated magazine for you.

Zehra Horoz

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January 2024

WASTEWATER PROBLEM IN JAPAN

Translator: Utku İlday

Eylül Hazal Akkaya

On March 11, 2011, Japan was struck by the most destructive earthquakes in history. The earthquake was so destructive that some towns were wiped from the map, and there was a 17-meter shift in the Earth's axis.[1]
This disaster paved the way for a series of events that still have an impact today. The tsunami after the earthquake caused some damage to Fukushima Nuclear Power Plant, resulting in damage that still shows itself. Today, due to this accident, the radioactive wastewater that has accumulated in the power plant for years has begun to be discharged into the Pacific Ocean, which is just one of these events.

HOW DID THIS DISASTER HAPPEN?

The powerful earthquake and the following tsunami caused the formation of giant waves up to 14-meter. These waves demolished the protective wall, therefore causing the electricity generators to go underwater, resulting in power outage in the power plant. With the earthquake, the reactors feeding the power plant were automatically stopped. The radioactivity of nuclear fuel in reactors has increased the heat energy of the reactors to high levels. Since there was already a power outage and the sea water pumps were not working, cooling water transfer could not take place, causing fire, chemical explosions, and fuel equipment meltdowns on the plant.[2] There were six reactors at the Fukushima Power Plant. Only three of them were actively working. The other three were closed due to being under maintenance.[3] With the hydrogen gas explosion caused by increasing pressure and temperature, the roofs of three separate reactor buildings blew off, resulting in radioactive leakage. The size of the area, which began to be evacuated gradually to ensure security, reached up to 20 km² on March 12.[4]

Although there wasn't any death caused directly by the radioactivity thanks to the swift evacuation of the area, but there were 19,759 deaths caused by the earthquake & tsunami, and much more with the inclusion of injured and missing. Around 1 million houses were left unusable.[5] Radioactive iodine was found in the tap water of Tokyo, one of the surrounding cities, at levels exceeding the legal limit. In addition, the fact that radioactive findings have been found in Iceland and America, extending beyond the cities around the region, is also an indication that the disaster caused intercontinental spread.[6]

Senior technology leader Fukumatsu Teruki explains the path followed this accident, which is known as the biggest nuclear disaster after Chernobyl, as follows:

"Here the damaged reactor contains molten fuel and needs to be constantly cooled, so we pour water on it. The dirty water that comes out is sucked in by a pump and this water is sent to the Advanced Liquid Processing System (ALPS). Ultimately, radiation is practically removed, except for the tritium, which will be stored in tanks."[7]



Hydrogen Explosion

It is still said that the amount of rain, groundwater and wastewater entering buildings is increasing day by day, the underground walls built to stop water ingress cannot provide full protection and radioactive contamination of water continues. The expected results were not obtained from this underground wall project, which cost $320 million dollars. By 2023, it has been understood that this amount will exceed 1 million metric tons and will no longer be stored. The Japanese government, which said that the storage areas started to fill up in 2019 and that they had no choice but to release the water into the ocean, officially discharged its wastewater into the Pacific Ocean on August 24, 2023, with the approval of the United Nations. It is known that other options are to bury it in the ground or evaporate it.[8]

The evacuation is planned to last 40 years through a 1 km long tunnel, built meters below sea level from durable water-tight material. It is estimated that 31 thousand tons of water will be discharged by March 2024.[9]

The water stored in the facility is filtered, but it cannot be completely removed from tritium. This is because tritium is a radioactive isotope of hydrogen. According to experts, although this substance does not pose a danger unless consumed in large amounts, there are disagreements on this issue. According to the statement of the Japanese Ministry of Environment, the tritium concentration in samples taken from locations close to the power plant was found below the detection limit.[9]

Although Japan said that this process was safe, criticism from neighboring countries was immediate. China, which reacted to the practice and filed an official complaint, decided to stop all seafood imports from Japan to protect consumer health. In the statement made by the Chinese Ministry of Foreign Affairs, it was said: "The ocean is the common property of all humanity, and discharging Fukushima's nuclear wastewater here, despite all objections, is an extremely selfish and irresponsible action that ignores international public interests."[10] South Korea also announced that it had stopped the trade of food and fish products from the region with a similar practice.

Although contrary claims are made, at this point, tritium in water endangers life. Many radioactive, nuclear, and similar substances spread all over the world thanks to the hydrological cycle. Substances mixed into water, like rain, also affect agricultural lands and the living spaces of animals and people. Radioactive substances spread in any part of the world affect every part of life.

People, animals, plants... Making sustainable decisions for the continuation of life should be supported and the Earth's integrity should not be disrupted.



Tanks where radioactive water is stored. [11]

TEXTILE & SUSTAINABILITY

Translator: Utku İlday *Ayşe Zeynep Haliloğlu*

You've probably heard the term 'sustainability' many times. So, what is the meaning of this term, is it a fact that shows itself in every aspect of life? Sustainability is not a term that is not limited by anything, it is a fact that shows itself in every aspect of life. And this text will be focusing on the effects of sustainability on textile & the fashion industry.

First and foremost, the word 'fashion' means 'to make' and comes from the Latin word 'facere'. Fashion, which is generally an indispensable part of the textile industry, is the creation of a product by combining different clothing pieces and patterns. But in this age, it is mostly used for clothing that have a short-term popularity. The emergence of this situation therefore caused the mass production, also causing crazy amounts of consumption. With this, the effects of the textile industry increased rapidly.

During and before the Second World War, people sewed their own clothes, mended their old clothes, and wore them again. But after the 1980s, everything started to change. A new and fast-turnaround fashion business model that produces more clothing collections at lower cost appeared.

In the Report of the Environmental Audit Committee of the UK House of Commons in 2019, the effects of rapid consumption are explained as follows: "A glut of second hand clothing swamping the market is depressing prices for used textiles. What can't be sold is torn up and turned into insulation and mattress stuffing. Worse still, around 300,000 tonnes of textile waste ends up in household black bins every year, sent to landfill or incinerators. Less than 1% of material used to produce clothing is recycled into new clothing at the end of its life. Meanwhile, retailers are burning new unsold stock merely to preserve their brand."



For example, in 2018, a British clothing company burned its unsold products with a net value of more than $40 million in order not to lose value. If the company were to reduce production, they could have taken important steps on the concept of sustainability.

According to the same report, if the textile sector continues to grow, clothing sales in 2050 will increase by 160 million tonnes, equivalent to three times today's figure. If the current trend continues, the textile industry could consume more than 26 per cent of its carbon budget in 2050.

The 'fast and cheap workforce' mindset of the textile industry shifted the focus to the poor countries with cheap labor. And this caused harsh working conditions and disasters, such as the Triangle Shirtwaist Factory fire in 1911 and the incidents in 2012 such as the fires in textile factories in Pakistan and the collapse of Rana Plaza. Such incidents revealed the environmental damage caused by the textile sector.

Rana Plaza, located in Dhaka, Bangladesh, was built in 2006 as five floors. The first five floors were designed for banks and various shops. Later, three floors were added illegally on top which were used as textile factories. As heavy machinery was located on the upper floor and a having a generator, the building could no longer bear the stress and collapsed. In the building there were nine international brands manufacturing in the building. These nine brands were using cheap labor in return for mass production. To meet the high demand for their products and reduce costs, these nine brands, like others, preferred cheap labor.

On 24 April 2013, at around nine o'clock in the morning, Rana Plaza collapsed. Cracks in the building had been noticed the day before, and the shops and banks below were closed, while production continued in the factories upstairs. The death toll was 1134. With this figure, the Rana Plaza collapse was recognized as "The Worst Garment-Factory Disaster Ever Recorded".

In the aftermath, more than 2500 workers were injured and killed, and the necessary compensation was not paid to their families. Initially denying that they had a factory in Bangladesh, some brands have been affected by the discovery of their own documents and labels during debris searches, so they came to surface. On the first anniversary of the disaster, these brands were boycotted by activists in front of their stores. The explanation of the brands mentioned in the incident for not paying compensation was that they had donated to the necessary charitable organizations.

While the textile sector produces more and more every year to respond to this consumption frenzy, most products that are produced become unrecyclable. The fact that it has not been taken responsibility for in this regard in the sector, raises questions in the public opinion.

As the environment and sustainability hold a great importance in human life, this problem should not be avoided. As the environmental damage of the fashion and textile industry increases, not only the manufacturers but also the consumers who shop from these brands need to change their habits. More natural products should be preferred, and the mindset of fast production and low cost should be put aside. Every sustainability step taken by consumers for the environment is a contribution to improving the quality of life of future generations.



GREENHOUSE

Translator: Mert Taşkın

Defne Kocaman

Our habit of consuming has given irreversible harm to our "known as an outright grace" nature with industrialization and urbanization. This unconscious and uncontrolled consumption merely has drained and has pushed off the limits of the nature, the very resources which have been bestowed upon us.

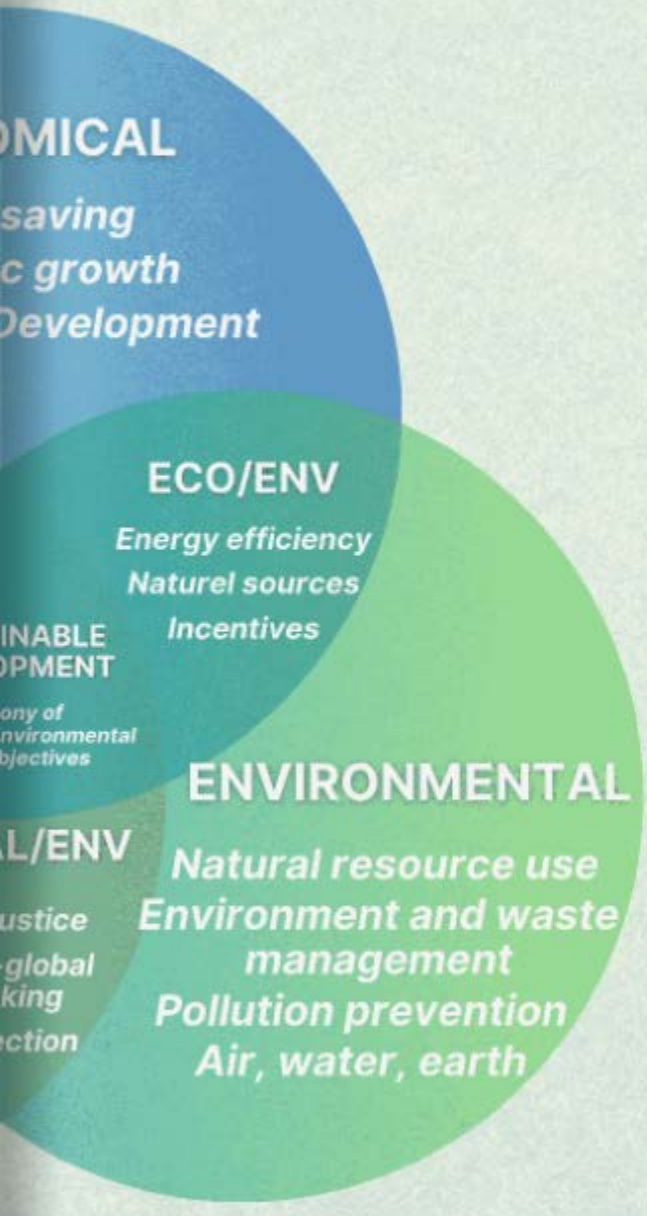
The concept of sustainability can be defined as the idea of production of services using the resources which don't harm and alter the nature.[1]

Sustainable reconstruction has some rooted basics. This approach aims a fair sharing mentality and a long lasting future by focusing the relationship between human and nature. It also carries the desire of making the term of justice be valid not only among humans but also between human and environment.[2]

As it is seen on the chart, sustainability is in the heart of economic, social and territorial factors. It is the working of these factors harmonizingly.



TECHNOLOGY



The nature has started alarming these consequences of unconscious consuming in various ways. As a result, people started finding an alternative energy resource and the idea of being sustainable is in the basis of these resources.

In nowadays people who became one with the city, in other words, who became the city itself has started to produce and develop various research and development ideas. These ideas has been integrated in different places of cities. As a result of these idea productions, green roofs project came in.

Green roofs which date back to old times comes from the term "roof garden". Of course, even used in BC they had a different purpose. Regardless of serving an economic an an ecologic purpose, it served as aesthetic garden at the building which it was used.

Green roofs which in today's world exists in many countries and houses split into two types in basic: Intensive(advanced) and Extensive(basic) roofs. With variety and depth in plants they have, intensive systems are more intense systems. Because of the herbal materials which are used in these systems, more effort is required for some components like; static, water insulation, root protection, drainage and plantation environment.[11]

Extensive systems on the other hand, is planned with the vegetation which has the most shallow plantation environments possible, doesn't require any additional watering other than rain and doesn't require intense maintenance.[11]

If there would be a consideration regarding the effects of green roof systems on cities, it would be possible to detect the benefits in social, ecologic and economic aspects. These effects can be exemplified with benefits such as; gentrifying the city, managing rain water and providing usage of it, prolonging life of the roof material, improving air quality, retarding speed of a potential fire, insulating heat of the building and increase in social consciousness.

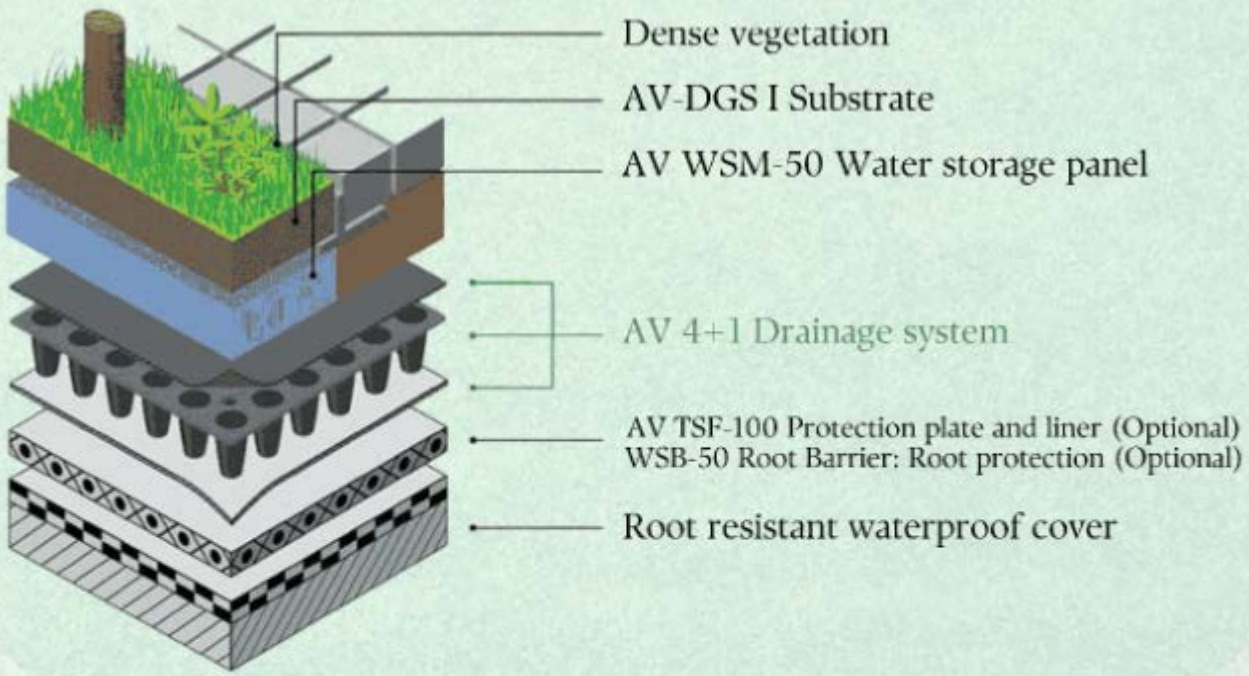


In near future despite the positive effects mentioned if green roofs are not generalized even when there are enough resources for it, a sad future will be waiting for us. Especially because of big population they have big cities will be affected more than small cities.

Green roof has an important place at the concept of sustainability. Because green roofs exactly provide the meaning of sustainability which is "prevent the usage of natural resources in order to protect ecologic balance".[3]

In spite of all these positive sides referred before, green roof practices have limited availability. The biggest reason of it is the cost of these roofs are high in today's economy. Watering and drainage, maintenance of the plants and the necessity of working with experts due to complexity of these systems are reasons that increase the cost. Another reason is that the created system causes weight at the roof and exceeds the load carrying capacity of it.

Considering these situations, green roof is a construction which should be researched and practiced. It is one of the systems we can incorporate in out life so as to make us and next generations live a bright future.



ENGINEERING AND SUSTAINABILITY SOCIETY

Translator: Senrat Şira Çavluer

Greetings to everyone, we, as Marmara University Environmental Engineering students, established the Engineering and Sustainability Club (ENSUS) on November 14th, 2022. We are a university club formed to increase awareness of environmental sustainability, natural resource management, various impacts, and activities among students.

Our club consists of a management structure divided into three main categories: Activities, Social Media, and Sponsorship Committees.

These committees are further divided into different departments such as IT, Communications with Alumni, Sustainability Days, Joint Events-Projects, and Social Responsibility, depending on the type of impact we aim to achieve. Each department is categorized based on the nature of the influence we plan to make within its specific domain.

All these departments work collaboratively under the leadership of the President, Vice President, and Club Secretary. Team members within each committee contribute together to the design, planning, and organization of activities and projects. It is a collective effort in brainstorming and implementing initiatives.

As a newly established club, we gather with new members at the beginning of each semester. We carefully select venues for introductory events that bring together the board members and committee members. At all the places we meet, we emphasize waste management and engage with businesses in collaborations related to these issues.

Due to the initial period of being online, our activities were conducted virtually. During this time, we organized two seminars; one focused on disaster preparation training, and the other on sustainability days.



In our disaster preparation event, we collaborated with the Tim Association, specifically with the Vice President in charge of the Search and Rescue Organization. The aim was to raise awareness among our members about both disaster preparation and social responsibility.

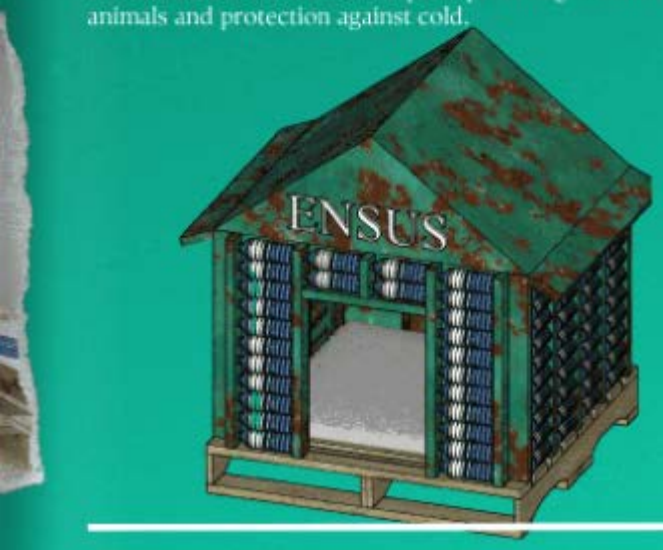
During the Sustainability Days, we provided our members with the opportunity to explore new areas within the field of sustainability through insightful talks from experienced speakers representing three different companies with expertise in sustainability. This allowed our members to gain practical insights and knowledge in the field.

With the completion of our first year, our newly elected leadership quickly began planning our activities for the summer term, aiming to continue and expand our impact.

This year, we participated in the Campus Impact Competition by "Akbank Gençlik Akademisi" with our main project, the Sustainable Animal Shelter project, and we were selected for the final round. The primary goal of our project is to create an animal shelter entirely from recycled materials, focusing on upcycling techniques, using waste plastic, canvas, and wood.

On the exterior of our shelter, there are also eco-bricks made by our members. These eco-bricks are created by filling clean and dry plastic bottles with both fine and non-recyclable plastic packaging waste.

This not only reduces the space occupied by plastics in nature but also forms a functional material, essentially creating a brick from waste. This way, as the walls of our shelter become more robust, the variety of waste we use also increases. To enhance this diversity, we collect leftover canvases and banners from past school clubs and events. We utilize these materials to create soft flooring and insulation for the lower part, providing comfort for animals and protection against cold.



Upon completion of our project, we will prevent dozens of kilograms of plastic waste from entering nature and oceans. For this initiative, we seek assistance from our members and various recycling workshops in Istanbul. The plastic portions are processed in a plastic recycling workshop called "Plab", while the canvas and insulation parts for the lower section are created using "reppatch".

While the entire project continues throughout the semester, we are also continuing to plan our other activities. Our first realized event was the "Sustainability Summit 23", organized in collaboration with the Verda Community. We had a total of 9 speakers who shared their projects, experiences, and plans related to sustainability with our members under the theme of sustainability. As a token of appreciation, we made three donations to TEMA Foundation for each speaker. During the event, we encouraged participants to dispose of their waste in recycling bins and provided information on waste separation.

In addition to participating in events as speakers, we are also engaged in social responsibility initiatives. We took part in an event organized by the "Çorbada Tuzun Olsun Foundation." This foundation has been distributing soup to homeless citizens for years, aiming to make a positive impact on their lives. We are eagerly looking forward to contributing to this effort by adding our ingredients to the soup and distributing it alongside our members.

In addition, we are considering concluding the semester with two more impactful events. The first one is the Alumni Event, where we plan for former students who have graduated from our department to share their experiences and insights from their workplaces with current students through a panel discussion. The second one is to organize a more comprehensive and larger-scale version of the Sustainability Days, which we initiated for the first time this year.

With every impactful event and project we undertake, we hope to reach people and bring about positive changes in their lives. The happiness derived from making a difference and the hope for an even greener future inspire us in all our endeavors.

"The nature of tomorrow is created today."
-Mustafa Kemal Atatürk

ECOLOGY

Translator: Utku İlday Zehra Horoz



Humankind emerged around sixty-five million years ago. Since then, their consumption of resources has rapidly increased. Initially living as hunter-gatherers before settling down, humans began engaging in agriculture as they adopted sedentary life. Looking for places to plant their crops, they prioritized locations near water sources, marking the beginning of water resource utilization.

With sedentary life, agriculture led to a lifestyle with increased usage of water and a growing population. As the population expanded, the demand for resources also increased rapidly, contributing to the Industrial Revolution. Both the first and second Industrial Revolutions are among the primary causes of today's sustainability challenges. The Industrial Revolution introduced machines as alternatives to manual labor. Oil, natural gas, and electricity became the foundations of almost all modern conveniences. This led to the establishment of many industrial facilities, resulting in unprecedented levels of air pollution.

A notable example of this issue is London in 1952. A thick fog struck the capital of United Kingdom, decreasing visibility to near zero. The main cause of this severe air pollution was identified as the excessive usage of coal. Coal not only created a layer in the sky, but also resulted in the loss of 4,000 lives and respiratory issues in 100,000 people.[1]

As time flew by, climate change became an globally significant topic. During periods of intense consumption, the contributions of those offering early warnings should not be ignored. People like Rachel Carson, author of the book "Silent Spring", foresaw the seriousness of these situations a hundred years ago and suggested to take precautions on many environmental problems, from air pollution to nuclear energy, and from pesticides to the consumption of water resources.

In her book Silent Spring, Rachel Carson suggested to add ecological issues such as climate and environmental crises to the international agenda.[2] Published in 1962, the book has foreseen the future and warned humanity beforehand. As humans continued to exploit the resources unconsciously, they realized too late the likelihood of resource depletion. Although mass awareness has brought these problems into focus today, the importance of Carson's book, was recognized much later.

Former United States Vice President Al Gore brought the book back to the surface as environmental and sustainability issues emerged as some of the most pressing global problems of the 21st Century.

In "Silent Spring", Carson highlighted many critical issues by discussing the concept of sustainability and her efforts in this field. Although Carson addressed these issues even before the United Nations, her views initially received little attention due to the social and economic conditions of the period.

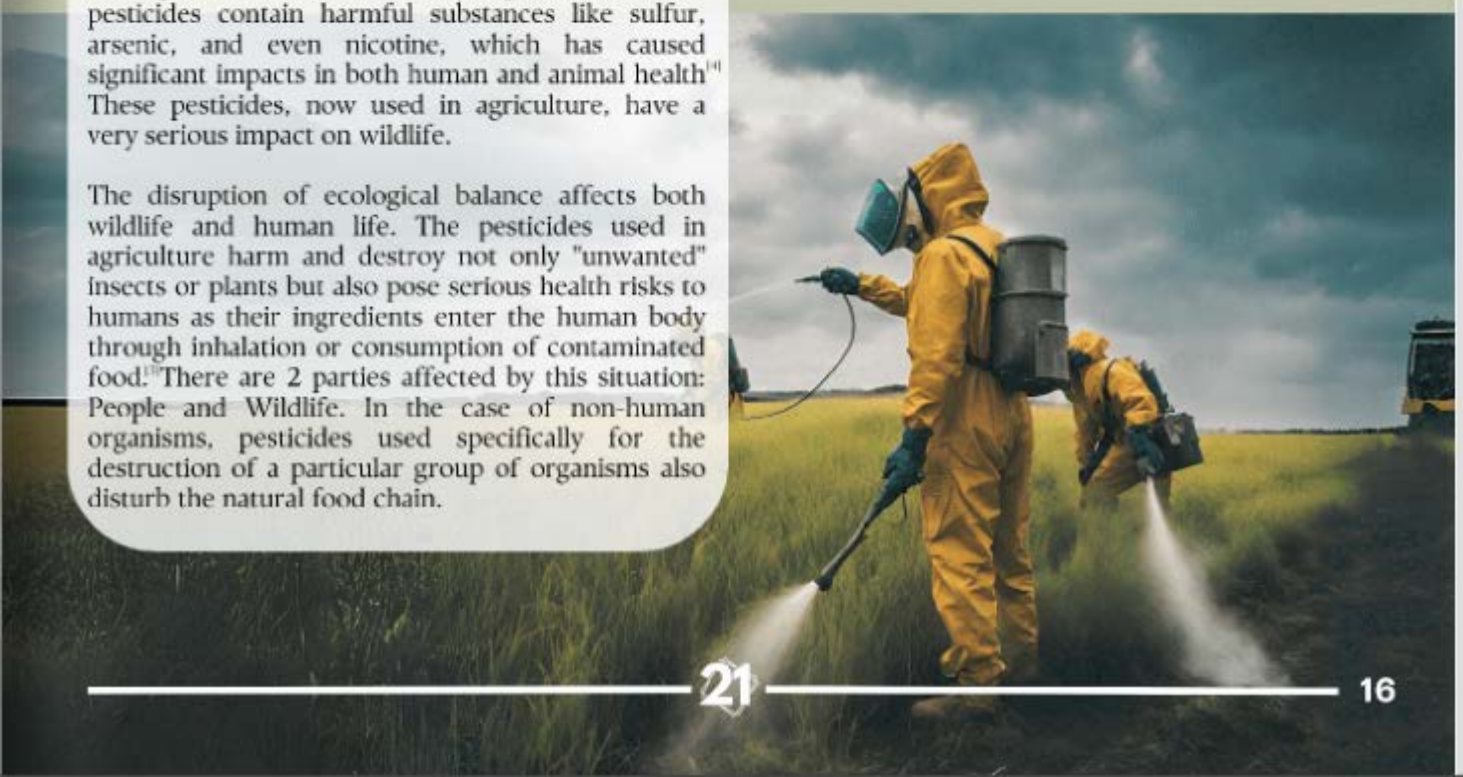


One of the most important points mentioned in the book is the use of pesticides, dating back to 1500 BC. Originally developed for lice, fleas, and wasps, these pesticides are now used in agriculture.[17]These pesticides contain harmful substances like sulfur, arsenic, and even nicotine, which has caused significant impacts in both human and animal health[18] These pesticides, now used in agriculture, have a very serious impact on wildlife.

The disruption of ecological balance affects both wildlife and human life. The pesticides used in agriculture harm and destroy not only "unwanted" insects or plants but also pose serious health risks to humans as their ingredients enter the human body through inhalation or consumption of contaminated food.[19]There are 2 parties affected by this situation: People and Wildlife. In the case of non-human organisms, pesticides used specifically for the destruction of a particular group of organisms also disturb the natural food chain.

An example of the indirect effect of pesticides is a family in the Assos region of Çanakkale used pesticides to get rid of snakes in their wooden house. Although they thought they had solved the problem at first, they found later that the house was overrun by rats, a situation exacerbated by the wooden structure. Their only solution was to demolish the house.

Ecological problems, which have increased significantly with human activities, have become an inevitable issue of our time. For example, the early humans who discovered fire could not have known the long-term environmental impact of smoke emissions. From the discovery of fire to the industrial revolution, factories, and mass production, the situation has deteriorated until today, with ethical values regarded as 'things to be aware of'. Companies, factories, and people in the 21st century must solve these increasing ecological problems by adhering to sustainability principles.



Unfortunately, the steps taken in the field of ecology and sustainability have been hindered, deemed either insufficient or unimportant, or sidelined for economic reasons. Will the 2030 and 2050 agreements, which promise to save our environment, truly save our ecology? Is it possible to achieve these goals in 27 years without changing people's lives? In fact, the answer to these questions goes hand in hand with the speed of action.

This global problem, long ignored despite warnings, cannot continue. Although we've been warned about it for nearly a century, we must not delay action any longer. The key goals are to meet the sustainable development goals by 2030 and achieve carbon-neutrality by 2050. Basic human needs encompass the fundamental requirements for every individual, including the capacity to breathe clean air, access clean water, and consume food free of harmful chemicals. Hece, the concepts of ecology and sustainability combine, aiming for a future where awareness prevails.



GLOBAL warming

Translator: Nursena Ulusu

Sena Demirkan

Global warming is the abnormal and artificial way of rise in the Earth's average temperature due to the increase in greenhouse gases in the atmosphere, captivating heat.

Continental drift and volcanic eruptions existing in natural systems and caused by the movement of Earth around the Sun have led the Earth to be extremely hot or cold. While many animal and plant species have gone extinct in those times, many new species that may adapt to the new conditions have appeared.

Life does not cease to exist currently as there are not any abrupt changes in temperatures. However, thousands of years of human activities such as fast and reckless consumption habits of natural resources and fossil fuels, pollution due to industrialization et cetera have brought a global issue about that might affect the life in the Earth by accelerating the tendency of its climate system to change.

The human's effects on global warming dates before the industrial age. They have developed cultivation activities for their nourishment needs; cultivation activities have developed settled life. As humanity progresses more, the rise in production from past to present has grown pollution apace.

Especially the temperature rise observed in the late 1900s has become a turning point in global warming. The fossil fuels provided and used, increase in industrialization, decrease in green areas and resources due to increase in population and urbanization have caused a rise in greenhouse gases. All of these cases are the main reasons of global warming and the change it brings in global climate.

An indispensable medium for life on Earth, the atmosphere is consisted of a mixture of various gases. The main gases in the atmosphere are nitrogen (78.08%), oxygen (20.95%) and carbon dioxide (0.93%).

Greenhouse gases, one of the most crucial factors in global warming, appear in many aspects of life from fossil fuels such as coal, petrol and natural gas to the aerosols in spray cans. The increase in greenhouse gases plays a major part in global warming and the changes of climate systems.

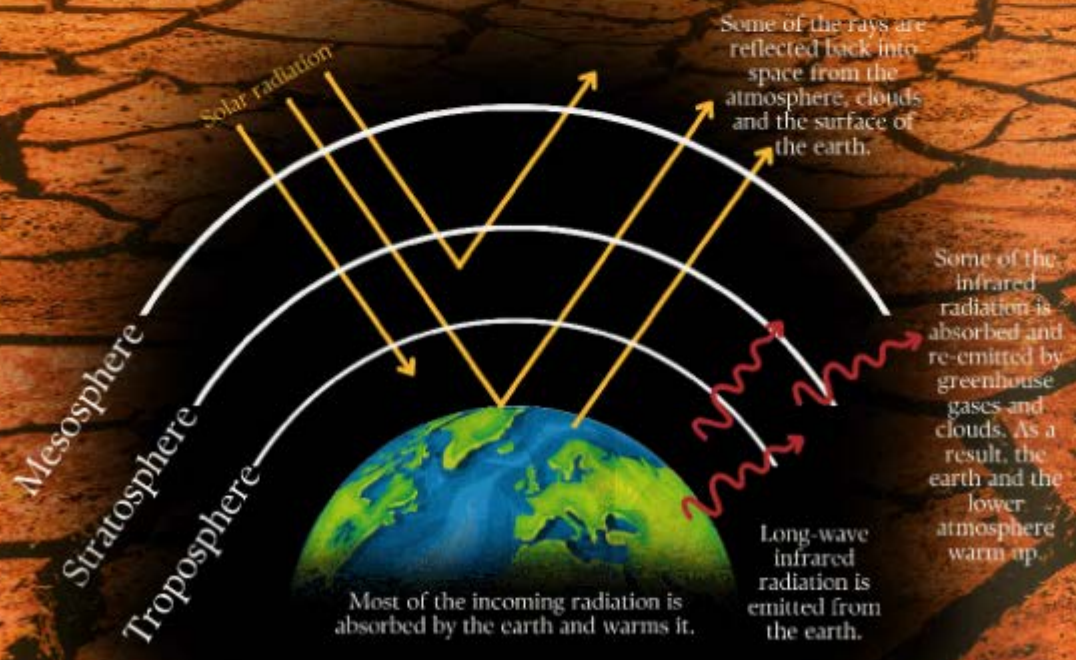
Majority of the solar radiation passes through the atmosphere and it is absorbed by the surface of Earth. However, some of the radiation released from Earth's warm regions cannot be reflected back.[1]Thus, the heat which is expected to be under regular conditions increase all around the world and this is called greenhouse effect.

Global warming and climate change jeopardize the ecosystem and the natural habitats of life forms. It affects the interactions among seasonal activities, migration times, numbers and species of life forms adversely. The rainfall regimes also change with the increase in temperature:

The expected temperature change in Turkey until the 2080s according to carbon dioxide accumulation is envisioned as 3-4° C increase in worst-case and 1-2° C increase in best-case scenarios.

The envisioned rainfall changes on Turkey according to carbon dioxide accumulation until the 2080s, unless the emissions are taken under control, is estimated to cause a 0 to -1 mm/day change (decrease) in best-case; and 0 to -0,5 change (decrease) in worst-case scenario.

Although different climates occur in the world as a result of the changes in temperature and rainfall, the results leave the same effect. Being a global issue, global warming has especially affected hydrologic systems. With the increase in forest fires drought, glacier melting, the danger life forms face in waters and the decrease in clean water supplies are only some of the results. Considering the temperature and rainfall envisions, in 50 years, the yearly decrease in stream basins per year is expected to be between 20% to 50%



The hydrologic effects have brought issues about in cultivation first. 70% of water usage in the world is for cultivation. In the upcoming years, if the global warming is not taken under control, a decrease up to 2.5% in production of cultivated goods is expected. A decrease in water quality and the usage of the same water in cultivation will damage the soil and the goods. It will also deeply affect human life as well as all of the other life forms and it will damage biodiversity.

The abrupt climate changes observed as a result of global warming increases the diseases by deviating the balance of the body. There are diseases seen commonly in tropical regions due to heat waves and are fatal. Although malaria and West Nile fever are usually seen in warm regions, due to global warming, these diseases have begun to be seen in northern latitudes as well over time. This will cause spreading of such diseases and similar serious health issues in the majority of the world in future.

Provision and consumption of fossil fuels are some of the main reasons of global warming. The air pollution occurring due to increasing fossil fuel consumption endangers the lives of people. The increase in cardiovascular and respiratory diseases caused by the consumption of fossil fuels also increase the health expenses.

Rise in sea levels, soil salinization, the increasing acidity of the oceans due to global warming and climate change; the melting of glaciers due to rising temperatures and the bodies of land shifting in the world highly deviates the world's balance and this situation sets a place up for natural disasters.

91% of the disasters occurring in the world emerge from climate. The most effectual disasters causing the death of millions of people are earthquakes and the flood that comes after. "Aside from people affected by disasters emerged by nature in moral and material ways, they leave their homes behind and migrate to places where they can feel safe."[2] Some statistics show that in the last 10 years the number of climate immigrants due to naturally occurring disasters and more than half of the immigrations in the world are caused by climate, forcing people to migrate.[3]

Global warming is one of the most important issues that is scarring and will scar our world. Considering the role global warming plays in the climate change and the effects, the vitality of this case should not be overlooked.

Instead of using fossil fuels that partake in global warming, renewable energy systems should be spread. Instead of single use products, sustainable ones should be used. Products that require lower fuel and give better results should be used for less carbon dioxide emissions.

Today's world destroys tomorrow's world. Global warming is not one of the subjects than can be overlooked. Continuing to take further steps, environment-friendly corporates becoming market leaders and such will help people limit the progress of global warming. In order to stop climate change, we need a world where global warming is noticed and sustainability is accepted.



ISTANBUL AIRPORT IGA INTERVIEW

Translator: Senrat Şira Çavluer

IGA, the operator of Istanbul Airport, continues to work, with its pioneering projects in the sector, sustainability policies and out-of-the-box innovative ideas by addressing the concept of sustainability in various aspects.

In order to make the journeys of its guests more comfortable and safe, it aims to work with the focus of bringing the mobility methods of the future to the present by using technology with a focus on human and environmental benefits.

Let's dive deeper into IGA, the operator of Istanbul Airport, which incorporates life-long issues such as Emission Management and Clean Energy, Water and Wastewater Management, Biodiversity, Gender Equality and art into its projects.

EMISSIONS MANAGEMENT AND CLEAN ENERGY

Within the scope of the Airport Carbon Accreditation (ACA) program of Airports Council International (ACI), IGA Istanbul Airport started its certification process as Level 1 in 2021 and crowned it with Level 4 certification in 2023. With the Level 4 certificate, IGA Istanbul Airport has clearly documented that it has a long-term carbon management strategy for absolute emission reductions in line with the Paris Agreement targets, has taken action in this direction and actively guides its stakeholders to reduce their emissions. It is also the first airport in Turkey to achieve level 4 in the "Airport Carbon Accreditation" certification.

IGA Istanbul Airport aims to use energy that is efficient, economical, sustainable and does not harm the environment, and instead of fossil fuel-consuming vehicles, it is turning to clean-source fuels and electric vehicles. It has declared its goal of achieving a "Net Zero" emission commitment by 2050 and published the 2050 Net Zero Carbon Roadmap.

In 2022, the amount of emissions realized was less than the amount of emissions committed in the roadmap. Various projects have also been implemented to increase the rate of green energy used at the airport.

Aiming to improve its environmental performance through Effective Energy Management, IGA is moving towards its sustainability goals with the measures taken regarding greenhouse gas management with ISO 14001, ISO 14064 and ISO 50001 standards.

In 2022, as a result of the carbon footprint management and reduction efforts carried out within the framework of the sustainability policy, it received an (A-) score in the CDP Climate Change Program. At the same time, a "5,000 Hectare Afforestation Cooperation Protocol in 5 years" was signed between IGA Airport Operation and the General Directorate of Forestry, and sapling plantations have started, and afforestation works carried out are expected to create approximately 1,258,554 tons of CO2 sinks for 25 years.

WATER AND WASTEWATER MANAGEMENT

Aware that water is an indispensable resource for the continuity and health of life on earth, IGA carries out its activities with the belief that its proper and efficient use is not a choice but an obligation, and carries out an effective water and wastewater management in order to reduce water consumption, use it efficiently and minimize water pollution.

The wastewater generated by operations is collected through the wastewater sewage infrastructure system and treated at the Advanced Biological Wastewater Treatment Plan with a capacity of 15 thousand m3/day. Water quality is monitored through continuous online analysis and the water recovered fro this system is used as landscape water. 100% of the irrigation needs of landscape areas are met from recycled water. Thus, 35% of the water consumed at the airport is recovered. Efforts are underway to increase the recovery rate.

WASTE MANAGEMENT

IGA Istanbul Airport works to minimize waste generation and regularly monitors the key performance indicators of all its stakeholders on waste, aiming to spread "Zero Waste" awareness among its stakeholders.

Waste collected from the airport is transferred to the Solid Waste Collection and Sorting Facility. All waste arriving at the facility is weighed and sorted in a semi-automatic sorting system.

Hazardous wastes are stored in the Hazardous Waste Temporary Storage Area after weighing and are collected by licensed recovery and/or disposal companies.

Domestic waste is utilized in incineration plants and organic (biodegradable) waste in biomethanization and composting plants, contributing to the circular economy.

Within the scope of the Waste Management System, 34% of waste is recycled thanks to sorting at source and semi-automatic sorting practices, and the company is committed to increasing the recycling rate day by day.

BIODIVERSITY

IGA also offers job opportunities in various engineering positions. With the Biodiversity Action Plan (BAP),IGA continues to work to protect biological values at the Istanbul Airport site and mitigate potential impacts. Within the scope of the BAP, which currently consists of 17 articles, bird monitoring and protection, afforestation, wildlife management and species monitoring are also ongoing. A special team monitors bird migrations and makes adjustments accordingly.

ART AND SOCIAL SUSTAINABILITY

The concept of sustainability is intertwined with art as well as economics and engineering. Deniz Sağdıç's "0" The Zero Point exhibition adds meaning to sustainability and consumption awareness with its works created with waste materials. The exhibition, which consists of portraits bearing the characteristics of different nations and includes the works created by the artist and his team after a four-month workshop, was exhibited in the "Bosphorus" area of the International Lines of IGA Istanbul Airport for three months. The proceeds from the sales of the artworks were donated to be used in a project in cooperation with the Cerebral Palsy Foundation and the Association of Pediatric Orthopedists to purchase 49 different medical supplies for children with disabilities.

The exhibition focuses on creating social value while guiding people towards conscious consumption habits by revealing the value of artistic transformation of waste.

SUSTAINABLE DEVELOPMENT

Adopting the principle of gender equality within the scope of the United Nations Sustainable Development Goals, IGA Istanbul Airport includes seed balls produced by working women in its projects.

After employees complete their online training, seed balls are dropped in hard-to-reach areas using eco-drones.This approach aims to support personal development while contributing to environmental protection and the sustainability of ecosystems.

IGA Istanbul Airport, which has the highest passenger density in Europe, welcomes thousands of passengers every day. While creating a comfortable space, it also invites passengers to contribute to its own policy of "sustainability" with environmentally friendly systems, actions and projects. While aiming to minimize the amount of waste, it works on projects where the waste generated can be utilized. It respects human, animal, and other living beings.

IGA Istanbul Airport Environment and Landscape Director Mr. Dr. Faruk Anılsın, Environment and Water Management Manager Mr. Fatih Altay, Deputy Director of Environment and Water Management Mr. Saner Töksöz, Merve Beşiktepe, Emircan Kara and our esteemed teacher Assoc. Prof. Dr. Neslihan Semerci for the interview.

INTERVIEW WITH POLAT ENERGY

Translator: Utku İlday

ENERGY

• You are one of the leading names in this sector, how did you turn to electricity generation, from renewable energy sources?

At the end of the 90's, when wind energy was becoming widespread in Europe, and there was not even legislation on this subject in our country yet. So, we set out with the idea that wind energy, which is one of the renewable energy sources, should be brought to the national economy, considering the developing technology and environmental impacts of conventional electricity generation facilities. At this stage, we are the largest energy company in terms of installed capacity in wind energy, and we continue to invest in renewable energy power plants to minimize the contribution of energy production to climate change, reduce foreign dependence on energy and ensure energy supply security.

• What do renewable energy and sustainability mean to you?

Humanity has needed energy, firstly for heating and then to establish efficient production facilities and to reach from one place to another. Humanity first used wood, which is an easily accessible energy source, and then coal. With the beneficial use of oil and natural gas, previously inaccessible comfort and efficiency has been achieved, which has led to an increase in the welfare of humanity. However, because of this, global warming and climate change have started to threaten the world. Renewable energy emerges as a solution at a time when these problems are becoming evident. Renewable energy power plants not only provide the energy needed by humanity, but also provide this need of humanity in harmony with nature, without harming the environment and the world.

As an energy company investing exclusively in renewable energy, the most important concept that guides us in our business is primarily sustainability. We carry out our activities in accordance with environmental, social, and economic principles, which are the basis of sustainability.

WIND POWER PLANTS

• What are the positive and negative ecological impacts of the power plants in the project areas?

Compared to conventional power generation plants, wind and solar power plants have no carbon emissions and water consumption. They also do not produce any waste. The ecological footprint left by wind power plants in nature is quite low compared to all other types of power plants. To avoid negative ecological impact, from the very beginning of the project development process, starting with the site selection, the necessary evaluations are carried out for the plants to operate in harmony with nature and the plant investments are implemented in parallel with these studies.

• What are the precautions you have taken for the existing habitats during the construction of the project or have any precautions been taken?

Before the construction of the Project, the habitat is assessed by analyzing the current situation and necessary measures are taken to protect the habitat. Birds and bats are regularly monitored before construction, during construction and during operation. Monitoring is carried out by academic staff under the control of the General Directorate of Nature Conservation and National Parks. All personnel working in the field are trained about the habitat before starting to work in the field, the measures taken to prevent damage to the habitat in the field and the issues to be considered during the work are explained. Environmental impact assessment studies in national and international standards are carried out specifically for each power plant and necessary actions are taken.

• Do the settlement areas of your power plants include the migration routes of birds?

We do not have any power plants on the main bird migration routes determined by the General Directorate of Nature Conservation and National Parks. The locations of our power plants have been selected considering the migration routes of birds. In addition, ornithological monitoring is carried out twice a year during spring and autumn bird migration periods.

• What are the changes in the environment after the power plants are built?

First, roads are improved to provide easy access to the previously problematic areas for qualified transport vehicles, and then these roads are kept open 365 days a year. In this way, transport facilities are improved for the people living in the region.

• How has the impact of the turbines on residential areas been observed and what are the impacts?

Noise analyses are carried out within the scope of the project EIA and ESIA studies for the areas where wind turbines will be located and the effects of the sound that will occur on the site after the construction of the wind turbines are examined. It is ensured that the sound from the turbines is below the threshold values of national and international standards. In this context, a guarantee is obtained from the wind turbine manufacturer for sound levels.

• What are the effects of the electromagnetic field created by wind turbines?

Wind turbines do not have any electromagnetic effect. However, if they enter the field of view of radar systems, they may appear as aircraft in some radar systems or the aircraft behind the wind turbine cannot be visualized by the radar. For this reason, technical interaction analysis is carried out at the project development stage before licensing to understand whether the points where wind turbines are planned to be built before licensing affect radar systems and the construction of wind turbines at the relevant points is allowed upon the understanding that there is no interaction.

SOLAR POWER PLANTS

• Although the efficiency of solar panels is less than that of wind turbines, why did you choose them?

Both wind and solar energy are energy sources that can be easily converted into electrical energy. It is important to bring both resources to the economy. If the lands that are not suitable for agriculture and not forested, where the wind is not at a sufficient level to produce electrical energy, are efficient in terms of sunshine duration and radiation, solar power plants will be the right method to produce electrical energy on the relevant land. Each project needs to be evaluated in line with the conditions and needs.

• What are the most important issues you take into consideration when choosing the location of your solar power plants?

To benefit more from the sun's rays, site selection is made by considering the angle of incidence of the sun, sunbathing time, amount of radiation, land slope, shading risks, accessibility, environmental impacts, and constraints.

• How do heavy metals used in solar panels affect the environment and the construction process?

With new technological developments, solar panels that do not use heavy metals have been developed. Heavy metals are not used in the solar panels we use.

• How do you solve the problem of hazardous waste from solar panels? Can these wastes be valorized?

With new technologies, solar panels can be produced in a way that does not contain heavy metals and does not leave hazardous waste. The panels we use in our facilities are the latest technology and are selected in harmony with the environment.

• What is the lifetime of solar panels? What kind of solutions do you produce or plan to produce for the waste arising from solar panels?

The useful life of solar panels is 25 years. Since solar panels contain valuable metals that can be economically utilized, there are serious recycling companies working on the recycling of panels.

• Solar Power Plants or Wind Power Plants?

Both our hybrid projects are together. All of them are useful and valuable for our country and our world.

TECHNOLOGY

• How is technological waste utilized? Does your principle of sustainability also apply in this area?

All technological waste is recycled in recycling facilities to be recycled back into the economy and not to harm nature.

• Technology means electricity and electricity means carbon emissions. How do you ensure this balance?

Electricity produced from renewable energy means electricity produced without carbon emissions. In this respect, we not only ensure this balance ourselves, but also ensure that people and institutions that use the electrical energy we produce contribute to this balance.

• What is accessible and sustainable electric energy?

Accessible and sustainable electric energy means that individuals and organizations can access environmentally friendly electric energy under competitive conditions in their activities. To achieve this, the price performance ratios of renewable energy electricity generation technologies must be affordable and wind and solar resources must be sufficient. Our company produces accessible and sustainable electrical energy by using wind and solar energy efficiently at well-selected sites using the latest technologies.




1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE AND JUSTICE STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
THE GLOBAL GOALS
For Sustainable Development

BIBLIOGRAPHY

Japan and Wastewater

[1]: Ntv. (2011, March 15). Dünya'nın ekseni kaydı! Son Dakika Teknoloji Haberleri | NTV Haber. https://www.ntv.com.tr/teknoloji/dunyanin-ekseni-kaydi,oR3DzYOqsku2exn5_IhuIQ

[2] [3]: Atakan, Y. (2021, March 11). Nükleer reaktör kazasından 10 yıl sonra Fukuşima'da durum ve alınabilecek dersler | Bilim ve Gelecek. Bilim Ve Gelecek. https://bilimvegelecek.com.tr/index.php/2021/03/02/nukleer-reaktor-kazasindan-10-yil-sonra-fukusimada-durum-ve-alinabilecek-dersler/

[4]: Başkanlığı, T. İ. B. a. V. a. D. Y. (n.d.). Fukushima Daiichi nükleer Santral kazası. T.C. İçişleri Bakanlığı Afet Ve Acil Durum Yönetimi Başkanlığı. https://www.afad.gov.tr/kbrn/fukushima-daiichi-nukleer-santral-kazasi

[5]: Tokyo şehir suyunda radyasyon - Haberdar.com. (n.d.). https://web.archive.org/web/20110813235512/http://www.haberdar.com/haber/tokyo-sehir-suyunda-radyasyon-2409275

[6]: Wikimedia projelerine katkıda bulunanlar. "Fukuşima I Nükleer Santrali Kazaları." Vikipedi, 13 Mar. 2011, tr.wikipedia.org/wiki/Fuku%C5%9Fima_I_N%C3%BCkleer_Santrali_kazalar%C4%B1.

[7]: Alexandrowicz, L. (2021, April 6). Fukuşima nükleer felaketinin 10. yıl dönümü: Bölgedeki çalışmalarda son durum nedir? Euronews. https://tr.euronews.com/2021/03/11/fukusima-nukleer-felaketinin-10-y-l-donumu-bolgedeki-cal-smalarda-son-durum-nedir

[8]: Japonya Çevre Bakanı: Fukuşima'daki radyoaktif suyu okyanusa boşaltmak zorunda kalacağız. (n.d.). https://www.cevremuhendisligi.org/index.php/cevre-aktuel/haberler/1183-japonya-cevre-bakani-fukusimadaki-radyoaktif-suyu-okyanusa-bosaltmak-zorunda-kalacagiz

[9]: Japonya'daki nükleer santralde depolanan atık suyun tahliyesi 30 yıldan uzun sürebilir. (n.d.). https://www.aa.com.tr/tr/dunya/japonyadaki-nukleer-santralde-depolanan-atik-suyun-tahliyesi-30-yildan-uzun-surebilir/2975946

[10]: Gazete, Y. (2023, August 24). Japonya, radyoaktif atık suyu okyanusa boşaltmaya başladı. Yeşil Gazete. https://yesilgazete.org/japonya-radyoaktif-atik-suyu-okyanusa-bosaltmaya-basladi/

[11]: Çolak, Ö., & Çolak, Ö. (2020, April 21). Fukuşima'da sonsuza kadar temizlik. Atlas. https://www.atlasdergisi.com/gundem/fukusimada-sonsuza-kadar-temizlik.html

Textile & Sustainability

"7 Ways to Break the Fast Fashion Habit - and Save the Planet." World Economic Forum, 8 Feb. 2020, www.weforum.org/agenda/2019/02/7-ways-to-break-the-fast-fashion-habit-and-save-the-planet/?DAG=3&gclid=CjwKCAjw6p-oBhAYEiwAgg2PguyiSY78efEWbXPCYjVFfTM1qXwHjaMOfrANZJenXmi7MOzvyb6qSxoC9d4QAvD_BwE.

https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/1952.pdf

https://emf.thirdlight.com/file/24/uiwtaHvud8YIG_uiSTauTIJH74/A%20New%20Textiles%20Economy%3A%20Redesigning%20fashion%E2%80%99s%20future.pdf

Green House

[1]: Cambridge Dictionary, 29.05.2017

Görsel 1: https://www.ewadanismanlik.com.tr/images/ckeditor/5_1.JPG

[2]: Bilgili, 2017: 563

[3]: Weller ve Sholz&Bart , 2009;Ekşi, 2014

[4]: Ekşi ve diğ., 2016

Görsel 2: https://www.aquaverde.com.tr/images/intensive_yesil_cati_katmanlar_sema.png

Görsel 3: https://www.parkroyalhotels.com/en/hotelsresorts/singapore/pickering.html , 30.05.2017 [5]: Oxford Dictionary, 29.05.2017

Ecology

[1]: CARSON, Rachel. Silent Spring. 2002.

[2]: ÇETİNKAYA AÇAR, Özge. "Pestisit-Eğitim-Notu". T.C. Gıda Tarım Ve Hayvancılık Bakanlığı Ulusal Gıda Referans Laboratuvarı. Temmuz 2015.

[3]: KARAKAŞ, Mehmet. "Bitkisel İnsektisitler". Türk Bilimsel Derlemeler Dergisi, c. 11, sy. 2, 2018, ss. 32-37.

[4]: ÖĞÜT, Serdal. "PESTİSİTLERİN OLUMSUZ SAĞLIK ve ÇEVRE ETKİLERİ". Şehir Sağlığını Geliştirme Araş. ve Uyg. Merkezi. (n.d.).

[5]: CARSON, Rachel. Silent Spring. 2002.

Global Warming

[1]: KÜRESEL İKLİM DEĞİŞİKLİĞİ VE OLASI ETKİLERİ, Murat TÜRKEŞ, Utku M. SÜMER ve Gönül ÇETİNER Devlet Meteoroloji İşleri Genel Müdürlüğü, Ankara

[2]: Health and Environment Alliance, (2017). Gizli Maliyet, Fosil Yakıt Teşviklerini Sonlandırmanın Sağlık Faydaları.

[3]: Tarım ve Orman Bakanlığı-Meteoroloji Genel Müdürlüğü, (2019). Meteorolojik Afetler 2018. Araştırma Dairesi Başkanlığı, Ankara.

Fotoğraflar: https://www.ekoiq.com/fosil-yakitlar-iklim-krizi-ve-orman-yanginlari-celladina-asik-olmak-mi/

Sera etkisinin şematik gösterimi : (WHO, 1996'ya göre Türkeş ve arkadaşları, 1999a).

Grafik 1850-1900 (°C) yılları arasındaki küresel ortalama sıcaklık farkı

Kaynak: https://public.wmo.int/en/media/press-release/2019-concludes-decade-of-exceptional-global-heat-and-high-impact-weather

Kurnaz, L., (2019). Son Buzul Erimeden İklim Değişikliği Hakkında Merak Ettiğiniz Her Şey. İstanbul: Doğan Egmont Yayınları.

Salih DOĞAN, Sezgin ÖZÇELİK, Ömer DOLU, Orhan ERMAN, İKLİM DEĞİŞİKLİĞİ ve ÇEVRE / 3 / (2010)

Türkes, M. 2001. Hava, iklim, siddetli hava olayları ve küresel ısınma. Devlet Meteoroloji İsleri Genel Müdürlügü 2000 Yılı Seminerleri, Teknik Sunumlar, Seminerler Dizisi: 1: 187-205, Ankara.

