

23 MAY 2022

VOLUME 3 ISSUE 26

# SYNERGY

BILKENT ENERGY POLICY RESEARCH CENTER NEWSLETTER



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BRENT OIL

111,09 \$/BL

GASOLINE

22.97 ₺/LT

USD/TRY

15.90

DIESEL

22.19 ₺/LT

EUR/TRY

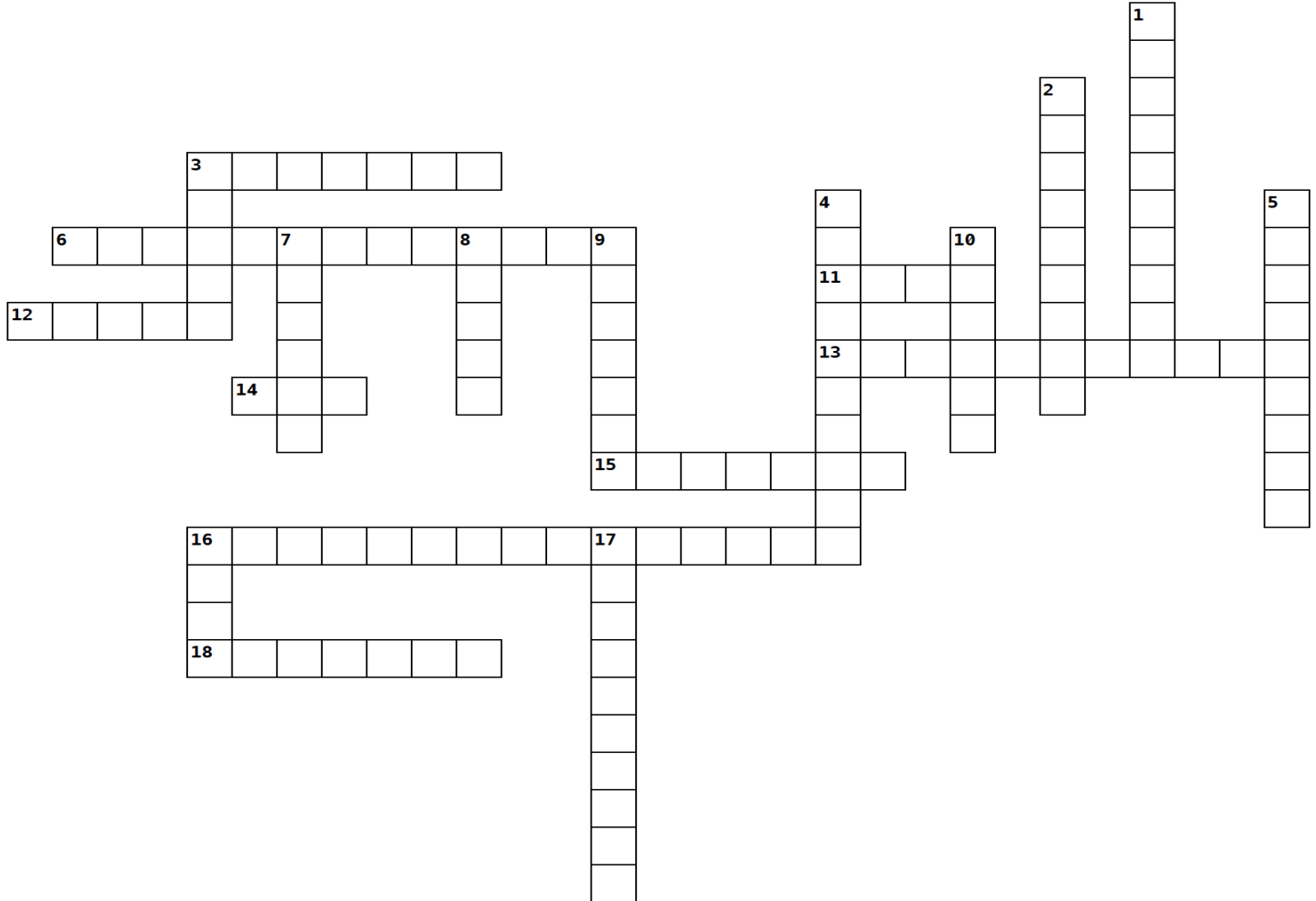
16.86

FUEL OIL

15.75

# Weekly Puzzle

Prepared by Büşra Öztürk



## Across

- 3.** A cyber worm attacked Iranian nuclear facilities
- 6.** Reducing the amount of carbon compounds in British English
- 11.** An abbreviation for LNG storage and supply ship
- 12.** The country which has the largest nuclear power plant in the world
- 13.** An emission trading scheme that allows emitting greenhouse gases via an exchange (hint: 3 words)
- 14.** An organization that is at the heart of global dialogue on energy
- 15.** A gas warms the climate 25 times more than an equivalent amount of CO<sub>2</sub>
- 16.** Recently become synonymous with energy security
- 18.** A fundamental element of battery resource for electric vehicles and energy storage.

## Down

- 1.** Nearly every state uses that facility to produce electricity
- 2.** The first solar-powered spacecraft
- 3.** The European country approved rules to cap natural gas prices
- 4.** Avoiding and eliminating energy waste
- 5.** A term which is changed from "phaseout coal" by India's demand
- 7.** A unit of crude oil volume
- 8.** Tanker name at risk of spilling oil into the Red Sea
- 9.** The company which rules the Yamal pipeline
- 10.** The period in which generating unit and transmission line are inactive.
- 16.** Fuel that produces the most amount of CO<sub>2</sub>
- 17.** One of the most important parts of natural gas transmission



# Reducing Our Carbon Footprint with Solar Panels

## IDV Bilkent High School Students

A group of volunteer 11th-grade students from the Turkish İDV Bilkent High School and the Slovenian Rudolf Maister Kamnik High School initiated a research project on the issue of renewable energy and its effects on the environment. Climate change and related problems are increasing daily. We believe that these problems can be reduced through effective education and awareness-raising. Based on reliable sources, we started by examining natural disasters around us, and we named the damage done to the natural environment by human hands as "environmental problems." Our research revealed that such environmental problems cause much more damage when compared to natural disasters, a finding which led us to take action.

We learned that 506 million tons of greenhouse gas emissions were produced in Turkey in 2019, 399.3 million tons of which were due to CO<sub>2</sub> emissions. We observed that 138 million tons originated from electricity and heat production. From researching renewable energy use, we understand that only 496,805 km<sup>2</sup>, approximately the

acreage of Spain, would be enough to meet the energy needs of the entire world population in 2030, only using solar panels. We realized that solar energy installations could reduce the usage of fossil fuels, and so we aimed to raise awareness through designing a project mainly focused on solar energy panels. We deduced that storage technologies and the installation of panels were costly in the short term and concluded that solar panels were not widely used. We also saw that achieving an 80-90% reduction in greenhouse gases by 2030 compared to 1990 values was among the EU's renewable energy targets.

Our first step was to examine panel prototypes and evaluate economic factors. Thus, we visited Gazi Technopark in Gölbaşı to see the operation of solar panels in the field. After a feasibility study, we decided to install panels with a total energy capacity of 2kW to illuminate the main corridor of our school. We initiated a collaborative process with the Ersis Energy company, and Bilkent University's Construction Works Technical Department. As a result, after studying a



### Installed Solar Panels in Our School Yard

suitable location for their placement, six panels donated by the Halk Energy company were installed in our school's garden by Ersis Energy engineers.

Currently, our school corridor is illuminated with the energy produced by our solar panels. In this way, we have both contributed economically to the school and reduced our carbon footprint. To extend awareness and reach a wider audience, we prepared presentations about our project and conveyed our experiences to partner schools. Our primary and middle school students came to the high school to examine the panels so that they could actively learn about energy renewal. We published a scientific article describing the details of the project in the March issue of "Enerji ve Çevre" and "Synergy" magazines, and an interview related to our project was published in the April issue of the Anadolu Aktüel Magazine. We also participated in a live broadcast on Radio METU's "Öğleden Sonra Kuşağı" on March 18th and Radio TRT's "Ailece" program.

The "ECO CLIMATE Economy and Climate Change Summit and Fair" held at the ATO Congressium, Ankara, from the 30th to 31st March 2022, attracted 50,000 participants and aimed to support the #greenmovement in combating climate change and its effects on the economy. We set up a stand and gave presentations in the 'green' hall, which were appreciated by business people from different sectors, the general public, and students, which allowed us to increase the interaction and impact of our project. On April 22nd, we celebrated "International Earth Day" at our school by organizing various events to draw attention to climate change and environmental pollution. We created an environment where students could exchange ideas and find solutions to environmental problems in five different workshops. We also designed a survey to evaluate the general awareness level of renewable energy, and so far, 535 people have filled out the survey. We aimed to enable our fellow students to positively impact their school environment and society and develop their leadership, communication, and negotiation skills.





### GSŠRM Kamnik Using Solar Panels

We carried out this project together with our project partner, the "Gimnazija in Srednja Sola Rudolfa Maistra (GSŠRM)" school in Slovenia. We have been taking part in video conferences with them since December 2021. Our partner school researched solar power plants in their school buildings and solar panel installation in Slovenia in general. We then participated in presentations at the "Climate Fair" held in Slovenia on April 1st. Ivan Kenda emphasized the importance of an energy-efficient home and making small changes in lifestyle that use far fewer resources like water, gas, and electricity. Kenda also pointed out that we should support the use of more renewable energy in Slovenia as currently, coal is the main energy source at 22%. In attending this conference, both schools wished to raise awareness in an international context about carbon footprint reduction.

Overall, through our joint project, we wanted to demonstrate that renewable energy sources are accessible and cost-effective. We wished to raise awareness of the

consequences of dependence on fossil fuels and focus on the importance of creating a sustainable future for humanity. We aimed to show people that we need to work on increasing the use of sustainable energy resources. For example, a solar energy panel of 1MW can meet the energy needs of 2500 households. These panels amortize their cost an average of 7.1 years after installation. Considering that the economic life of a solar power plant is 25 years, solar panel installation is a profitable investment in the long term. The project's next step will be taken at Bilkent University. Studies have been carried out to install solar panels all over the university in the coming year, which has opened the exciting possibility of a renewable energy campus.

# Norway's Increment Plan of Gas Supply to Europe

Yaren Öztürk 

The Russian invasion of Ukraine on February 24 led to various discussions and crises in the energy sector. As the already high gas prices increased, European countries started to look for solutions on how to fill their warehouses and produce an alternative to Russian gas. The European Union countries took a joint decision and promised to stop buying gas from Russia before 2030. This promise, which is not easy to fulfil, also causes pressure on the energy side of the sanctions discussed to be applied to Russia. While European countries are looking for an alternative to Russian gas in various regions of the Middle East, Central Asia and Africa, their closest and least politically problematic supplier, Norway, stands out as a logical solution.

Norway is one of the world's largest energy exporters and a global advocate for climate change mitigation. Norway has set a goal to reduce greenhouse gas emissions to 40% of 1990 levels by 2030 and become a low-carbon society by 2050. On the other hand, hydropower is one of Norway's primary sources of electricity generation. Since the late 1800s, hydroelectric power has been one of Norway's most significant energy sources since the energy in waterfalls and rivers has been used for power generation. Renewable

energy covers 98 percent of electricity production in Norway. Thermal energy and wind energy also occupy a large area at this rate, which is high compared to Europe. Norway, which has the offshore wind energy opportunity that almost all of Europe has, also has the potential to increase green hydrogen with offshore wind. Today, 20 to 25 percent of the natural gas used by the European Union is supplied by Norway through large pipelines located under the North Sea.

In 2021, European Union countries imported 155 billion cubic meters of Russian gas, which constitutes about 40 percent of the natural gas they use. In the same year, Norway's natural gas production reached 113 billion cubic meters, meeting about a quarter of the UK's natural gas demand. Minister of Petroleum and Energy of Norway Terje Lien Aasland stated that Norway should remain the main energy supplier to Europe and indicated that Norway could provide additional gas to compensate for the decline in Russia's natural gas deliveries due to the war between Russia and Ukraine. He stated that one of the critical points here is that no situation will cause difficulties in managing Norway's oil reserves. After Russia stopped natural gas shipments to Poland and





Bulgaria, 10 billion cubic meters of gas purchased by Poland from Russia will be replaced by Norway's North Sea gas fields situation can be considered the basis of the Minister of Petroleum and Energy of Norway's words. This situation is an important opportunity for Norway, the world's third-largest gas exporter. On the other hand, the European Union's plan to reduce its dependence on Russian natural gas by two-thirds based on increased imports of liquefied natural gas also depends on alternative pipeline gas suppliers supplying an additional 10 billion cubic meters per year. Although this plan, announced by the European Commission, is a response to Russia's ongoing aggression against Ukraine for about 2 months and the Russian government's frequently voiced threats to restrict and cut off the natural gas flow to Europe, Western Europe's largest oil and natural gas producer Norway have come to the fore with the questions of increasing their production capacity and how much they can fill the gap that would have to be filled in the absence of Russian gas.

While the Norwegian oil and gas fields produce at approximately 100% capacity, it is possible to adjust the oil and gas mixture in some cases. The government can

set quotas in certain areas to ensure that production in the country peaks over time. Norway, the world's seventh-largest natural gas producer, pumps around 4 million barrels per day, almost equally between oil and natural gas. It exports approximately 95% of the natural gas it produces through a vast submarine pipeline connecting to terminals in Germany, England, France and Belgium. A new pipe for Poland is expected to be completed this year. On the other hand, considering that Norway's oil and gas fields are already producing at maximum capacity, there are certain difficulties in increasing natural gas supply to Europe. Nikoline Bromander, an analyst at Oslo-based company Rystad Energy, says Norway expects its total natural gas production to increase to 126.5 billion cubic meters this year. However, there are also thoughts that this growth will not be sustainable. Some of Norway's gas fields, including the Trol under the North Sea, are thought to decline over the next decade. Even if the government achieves significant results by approving new discoveries, these discoveries do not seem to be able to compensate for the decline in production quickly.

# Women's Participation in the Energy Sector

Büşra Selin Kartal 

Energy is an area that concerns all living things globally, so everyone should have a say. Despite this, although the number of women in the energy sector continues to increase, gender equality is still not achieved. While the energy types in the world are changing and the green transition is trying to be increased, the low participation of women in this important sector is a major shortcoming. There are many reasons for this: both for women and the sector.

Unfortunately, there is still a wide wage disparity in the industry. It is also the case in countries classified as democratic. While in 2016, the median salary of a male employee in the energy sector in the USA was \$75,800, while the controlled female wage was \$70,200 and the uncontrolled female wage was \$58,500. Also, for 2022 data relative to 1\$ earned by men, while uncontrolled female wage is 0.88\$, the controlled female wage is 0.98\$. Although there are some improvements, there is still a wage disparity between men and women. According to 2020 data, women working in the oil and gas industry in the UK are paid 22% less than men working in the same job. In addition, according to 2018 data in Canada, which has energy and

mining companies in many parts of the world, women's wages are 6.7% less than men in mining, quarrying, and oil and gas extraction sectors. Employees cannot be expected to be highly motivated in sectors with high wage inequality.

Another problem is the low participation of women in the sector. In particular, it is seen that the number of senior officials is low, and the inability of people to be promoted is another motivation-reducing reason. Even though women have the same academic qualifications as men, they are less employed in senior positions. The International Energy Agency (IEA)'s study of 2,500 firms found that only 13.9% of high-ranking posts were women. While it is stated in the same study that women are represented more in large international companies, this is explained by the constant examination of investors due to their high demands on large companies. Large companies share publicly available reports on the environment, women's rights, diversity, and employee rights. This transparency-providing application also enables companies to self-criticize and improve themselves on the issues they lag, perhaps to avoid reaction from the public or as a PR tool. It is possible to say that





women are represented more in companies that develop their policies in this direction.

Women's employment, especially in jobs requiring heavy industry, is lower than that of men. This leads us to think that women do not have a place in sectors such as energy. However, women's employment in energy is not limited to heavy industry. When looking at the other fields, Business administration, Economics, Accounting, Finance, all majors in engineering, computer science, political science, geology, chemistry, etc., many women who are graduates of fields such as these can work in the energy sector in these fields. Perhaps one of the most important problems here is that women are not informed about their roles in the sector in this period when stereotypical gender roles are being tried to be destroyed. Therefore, women who want to work in these sectors start 1-0 behind due to stereotypes.

After these major shortcomings of the industry, there are barriers created by cultural and social norms, which are a bigger problem. In an International Renewable Energy Agency (IRENA) study on the renewable energy

sector, 72% of the answers are that cultural and social norms are one of the three biggest restraints. In addition, vocational education given to women is also at a low level. 41% of people see the absence of gender-specific training opportunities as a barrier. It can be said that women are mostly affected by these norms and social orientations. They can include areas considered more socially useful in their career choices. Again, according to IRENA reports, the number of female students in STEM fields is low. Accordingly, 45% of women working in the renewable energy sector work in managerial positions, while 28% work in science, technology, engineering and math (STEM) fields.

People's preference for the sector can be increased by the importance given by the state to the energy sector, and accordingly, by increasing information and employment, and by the presence of government incentives. As a country with a low level of democracy, Russia is a good indicator that women's participation can be increased. Russia has the highest participation of women in energy companies, with 23.1%. The list continues with Australia and United Kingdom at 15.5%. In addition, female employment in the



energy sector in Russia is higher than in the non-energy sectors. Since the energy sector is state-based in many countries and is managed by the state, governments need to take steps to support women's employment in the sector.

There are good opportunities for women, especially in renewable energy. Women have also initiated many entrepreneurial projects for alternative energy sources. However, women make up 32% of the world in these fields. Despite the many problems they face in the sector, women continue to increase their numbers, but some solutions can be offered to remove these problems. First of all, starting from the above problems, efforts should be made to eliminate the wage inequality in the sector. It would be better for states to regulate employee rights regardless of gender to eliminate employee inequality. Because, as stated, the energy sector is one of the sectors in which the states are closely involved. There are also situations where social norms that society needs to stop creating barriers to women. Although this is time-consuming in our societies, employing women in jobs other than the imposed roles and giving them responsibility will improve women's rights

globally. In addition, women must take the energy sector out of obscurity and become knowledgeable about the sector. For this, promotions can be made in schools during the students' career and school preference periods. Women can be brought into the sector by providing more inclusive vocational training for women, incentive programs, and supporting women entrepreneurs. In addition, listening to the problems experienced by women currently working in the sector and carrying out improvement works will increase the number of women by recommending the sector to each other. (These can be problems such as gender-based mobbing, not being preferred, not being promoted, verbal, physical, psychological violence, and intimidation.)

As women's participation in the business world increases, their number will also increase in the energy sector. Improving women's working conditions and participation in the energy sector is a great opportunity for both countries and energy companies. It should not be forgotten that the energy sectors are in important positions in countries where women participate more.



# Secret Harm of Antidepressants

## Gölce Özdilekcan

Today, we are all aware of how health care is advanced, and the average life expectancy of a person has increased. Thanks to the medical improvements, there are many types of cures for many diseases. We can find thousands of the kinds of drugs on the market, and all aim to cure another illness in the body. We can assume that the medication market has widened throughout the years with the increasing demand for medications. Some of the drugs are familiar ones found in the shelter without any prescription. However, other types of medications with more side effects but are often prescribed. They are called psychoactive drugs. Whenever we hear the word, we can name some of them or know someone who has been using these drugs in their daily lives. Apart from their common side effects, with further research on this topic, it has been found that these drugs have different hazards than only human health. Starting from the production process of these drugs, the consumption and waste management process of these drugs poses a threat to the environment with the chemical substances. Considering that 11% of US citizens over the age of 12 use antidepressants, there is a massive production of antidepressants and consumption.

Even though there are many psychoactive drugs on the market, the main environmental hazard has been recently found in the substance called Fluoxetine. According to the most recent studies, "Detectable levels of these drugs, and other commonly used medications, have been found in the UK's sewage, drinking water, rivers, coastal waters, and animal tissues, and pose a potential threat to natural habitats and ecosystems." These substances are mostly related to water pollution, and it is not only limited to the production process, which we usually blame for pollution. However, the problem itself has not created only the fabrication, but the usage of these drugs can also cause the problem. Therefore, unlike any other environmental hazard, the approach of regulating the production itself wouldn't be enough. The increasing demand for these drugs is considered the main hazard to the environment. Controlling the demand for the drugs can be the main solution, unlike the other proposals that we have come up with regarding the limitation of production.

### What are the Experts Saying?

Using different research and experts' ideas on the matter, I realized that this problem is often not researched for antidepressants. However, pharmaceutical pollution is a



widely researched issue. This is mainly because some of the drugs used in psychiatric treatments have no other substitutes. Experts in the medical field think that using these drugs is a must if the patient is diagnosed with a certain psychiatric disorder. I had the chance to interview Prof. Dr. Elvan Özalp in her clinic, who has been a psychiatrist in the field for over two decades. Also, being an environment protector herself, she mentioned her concerns about the on-point usage of drugs prescribed and how to decrease the environmental damage we create.

She mentioned that she acts very carefully when she is prescribing certain types of medications in her practice. However, this is usually not the case in today's general psychiatric practice. Usually, the period assigned for a patient in a public health care center is nearly ten minutes. This is especially hard for the physician to diagnose the patient and give further information. Therefore, even though there are no specific data for overprescription of psychoactive drugs, she thinks that even though there is a prescription for these drugs, they are easy to reach, which causes exploitation of the drug. Also, after the COVID outbreak, the number of people who tried to reach a professional increased, resulting in more prescriptions.

On the other hand, she thinks that seeking professional help for mental health issues is often misunderstood. Depending on the diagnosis, a patient can be treated by therapy without using the medication. However, a common thought in society is that therapy is costly and time-consuming at the same time. Therefore, people often find psychoactive drugs as a quick fix where they go to the doctor's office and find a solution instantly to their problem in just ten minutes, which is unrealistic. Özalp especially underlined the importance of raising therapists to reach the high demand for professional help. Many people are seeking, however, there aren't many therapists to cure each potential patient without medication. Also, she mentioned that every therapist has their approach to treating a patient, and there are many approaches. Since there is a shortage of both time patients and therapists, the dynamic psychotherapy approach is more suitable. Therefore, preventing an environmental hazard can be changed by changing how society looks at mental health illnesses and cures.





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