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# SYNERGY

BİLKENT ENERGY POLICY RESEARCH CENTER NEWSLETTER

A woman with blonde hair, wearing red sunglasses, a white button-down shirt, a black and white polka-dot scarf, and bright red pants, stands in a field of plastic waste. She is holding several shopping bags, including a white one and a plaid one. She has a brown fringed bag slung over her shoulder. The background shows a hazy landscape with mountains.

## Fashion Mountain

# 04 10 12

UNDISCOVERED OIL  
AND GAS RESOURCES  
IN THE EASTERN  
MEDITERRANEAN

MISCONCEPTIONS  
ABOUT  
ENERGY

INFLATION:  
OPEC  
AND OIL

# In This Issue...

## 04 ..... Undiscovered Oil and Gas Resources in the Eastern Mediterranean...

More than 5 trillion cubic meters (tcm) of natural gas has been discovered in the Eastern Mediterranean region since the first gas discovery in Egypt's Abu Madi gas field in 1967...

## 08 ..... Fashion Mountain

Fashion is a massive sector that changes very quickly according to seasonality, popularity, and other sectoral trends in the world. The fashion industry includes special designs (haute-couture) and fast fashion that will offer different economic alternatives for consumers...

## 10 ..... Misconceptions about Energy

Energy is a comprehensive topic, a word about which, in our daily lives, we see, think of, and talk. In popular usage, the term "energy" is used in many other ways...

## 12 ..... Inflation: OPEC and Oil

Almost every day, we complain about why these prices are increasing at such speed or whether this increase is permanent or temporary. A few days ago, on November 10, the Consumer Price Index (CPI) of America for October, was announced...

BRENT OIL

74.94 \$/BL

GASOLINE

9.75 ₺/LT

USD/TRY

12.57

DIESEL

9.86 ₺/LT

EUR/TRY

14.18

FUEL OIL

9.09

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# ABOUT US



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# Undiscovered Oil and Gas Resources in the Eastern Mediterranean:

## A Comparison of the USGS Assessments in 2010 and 2021

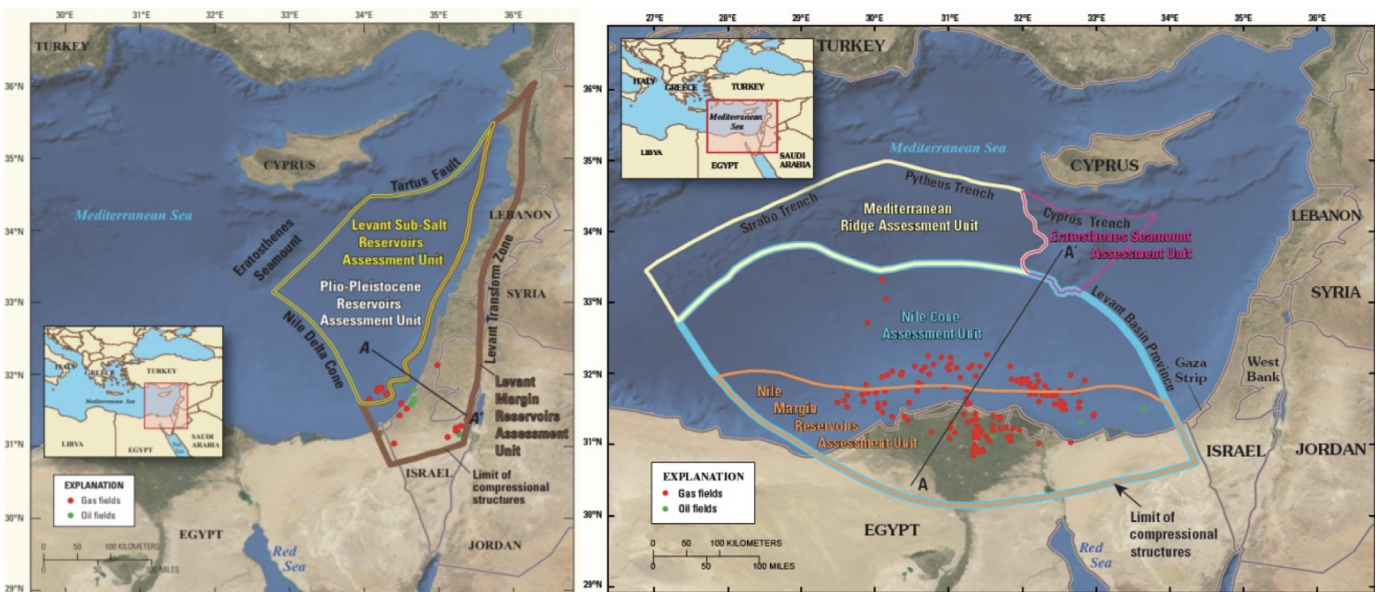
Sohbet Karbuz 

More than 5 trillion cubic meters (tcm) of natural gas has been discovered in the Eastern Mediterranean region since the first gas discovery in Egypt's Abu Madi gas field in 1967. This is more than the total amount of gas discovered in Norway. Around half of that volume was discovered since 2009. Some of the discoveries, namely, the Tamar and Leviathan fields in 2009 and 2010 in Israel, Aphrodite in 2011 in the Greek Administration of Southern Cyprus (GASC), and Zohr in 2015 in Egypt were among the world's largest deep-water gas discoveries. Of these, the Zohr field is the largest gas discovery ever made in the Mediterranean Sea. Consequently, the Eastern Mediterranean has become one of the most exciting new frontiers of natural gas

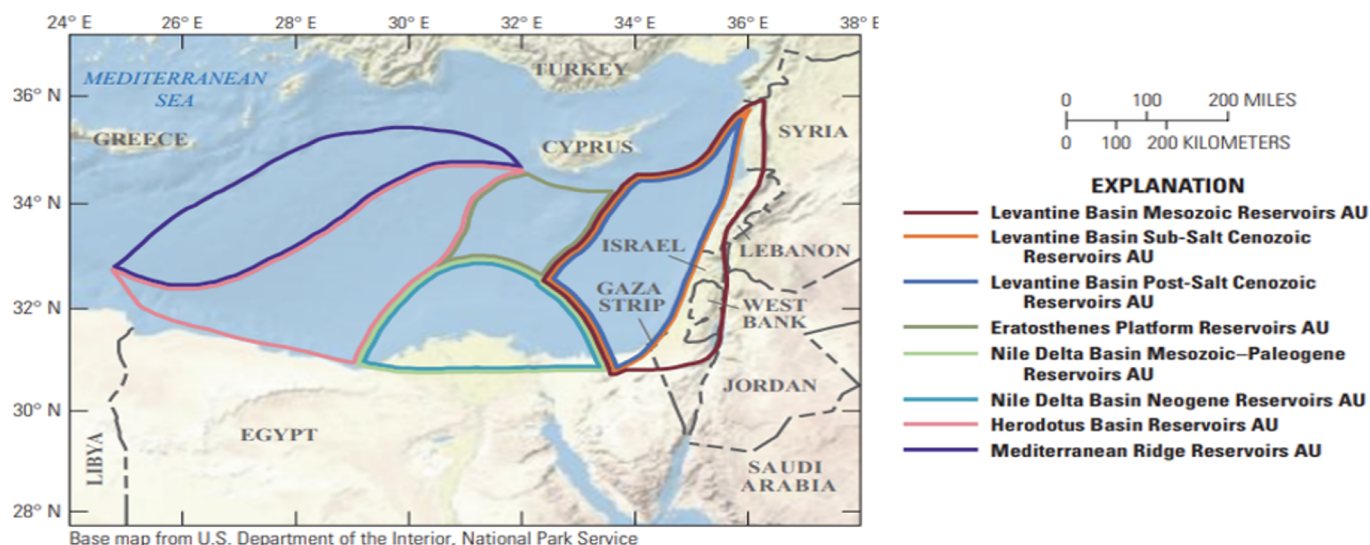
exploration worldwide. However, this is not the only reason why the region has sparked international interest.

The Eastern Mediterranean region is estimated to have substantial yet-to-be-discovered hydrocarbon resources. The United States Geological Survey assessments as well as the estimates by the officials in the region indicate that the region's undiscovered potential is twice as much as the total gas discoveries made there so far. When the volume of discovered gas and undiscovered gas potential are combined, the resulting total places the Eastern Mediterranean region on par with the North Sea, whose holdings are divided among Norway, the UK, the

**Figure 1: The USGS assessments in the Eastern Mediterranean in 2010**



Source: USGS

**Figure 2: The USGS assessments in the Eastern Mediterranean in 2021**

Source: USGS

Netherlands, and Denmark.

### The USGS assessments

The United States Geological Survey (USGS) released three assessments concerning the technically recoverable undiscovered oil and gas resource potential in the Eastern Mediterranean.

Two of them were in 2010 – one for the Nile Delta and Mediterranean Sea sectors of Egypt and the other for the Levant Basin Province. In March 2010, the USGS released an assessment concerning the technically recoverable undiscovered oil and gas resource potential of the Levant Basin Province which covers mainly offshore territories including the Gaza Strip, Israel, Lebanon, Syria and Cyprus. The study estimated the (mean) undiscovered potential of 4.8 billion barrels of oil (including natural gas liquids) and 3.45 tcm of natural gas in the area.

Two months later, in May 2010, the USGS issued another assessment. It was for the Nile Delta Basin province, which corresponds to the Nile Delta and Mediterranean Sea sectors of Egypt. This assessment put the (mean) undiscovered oil (including natural gas liquids) potential at 7.7 billion barrels and natural gas at 6.3 tcm.

The above-mentioned discoveries and the USGS assessments have not only significantly augmented hopes for large

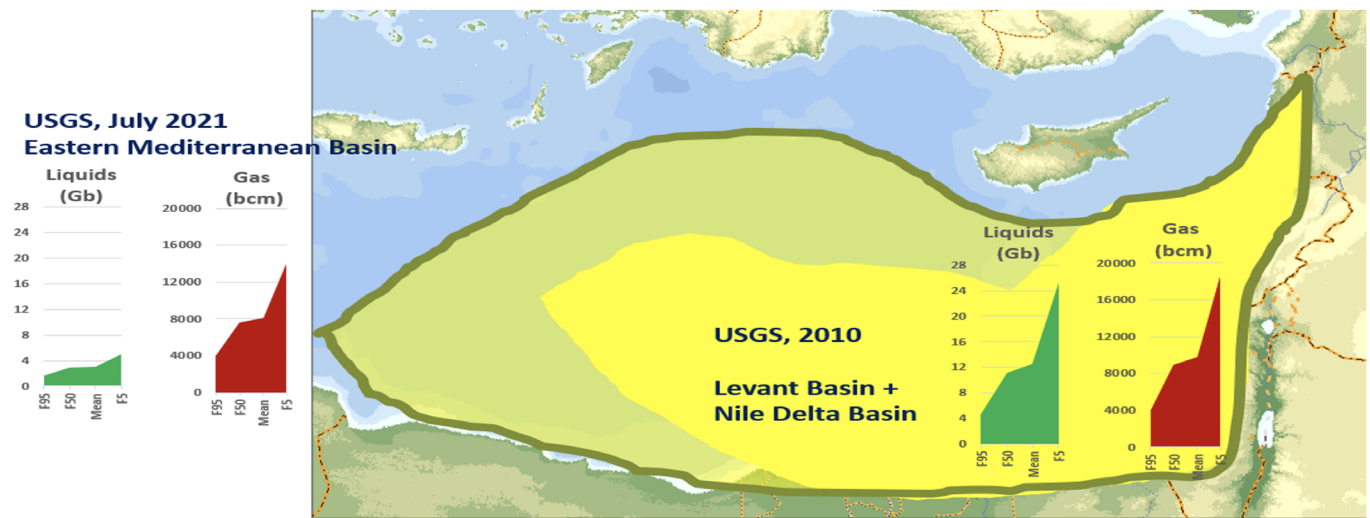
hydrocarbons potential in the Eastern Mediterranean but also made it a fast-rising favorite for international oil and gas companies if only because the potential prize seems too big to ignore.

Recently, on 8 July 2021, the USGS released another estimate for the undiscovered resource potential of the Eastern Mediterranean. It estimated undiscovered, technically recoverable mean resources of 3.1 billion barrels of oil (including natural gas liquids) and 8.1 tcm of conventional gas in the region.

Interestingly enough, despite the previous USGS estimates have been references in virtually all technical articles and presentations on the Eastern Mediterranean hydrocarbons developments, the recent assessment has not yet attracted any attention in literature and in the press. This is very surprising!

### What the 2021 USGS assessment tells?

At first sight it seems that, the recent USGS assessment revised downwards (compared to the assessments in 2020) the estimates for the undiscovered oil and gas resources in the Eastern Mediterranean. This is not necessarily the right conclusion for two reasons. First, the covered area in the USGS assessment in 2021 (or USGS 2021) is larger than the two USGS assessments made in 2010, as can be seen in the figure below. Second, although there have been no

**Figure 3: USGS estimates for the undiscovered oil and gas resources by fractiles in the Eastern Mediterranean**

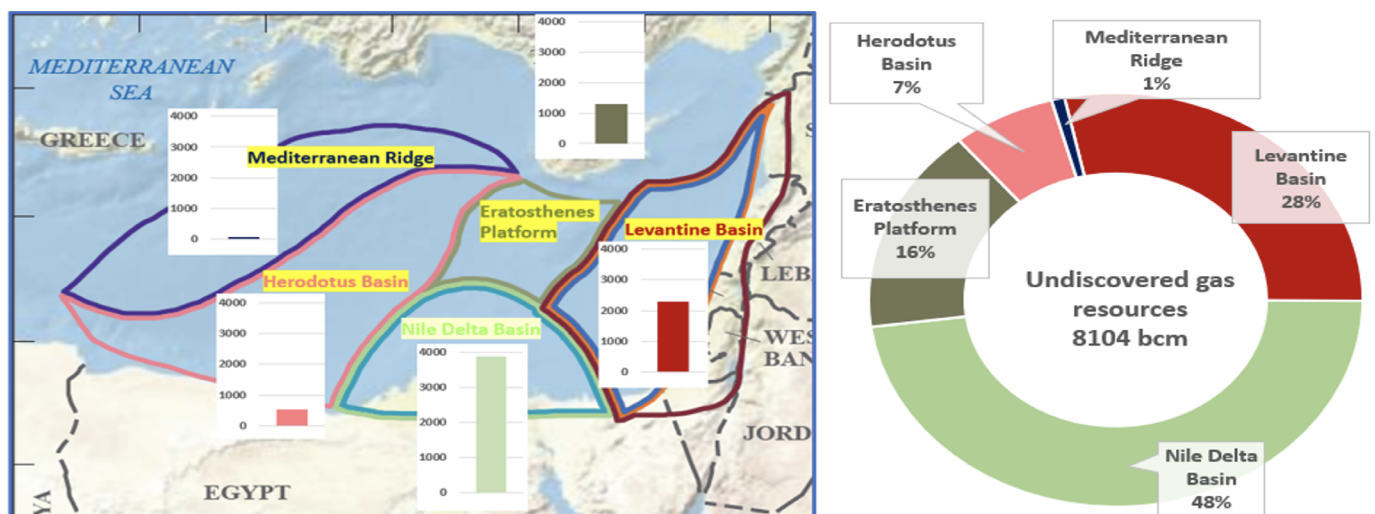
**Source:** Author's elaboration, based on USGS assessments. Note: F95 represents a 95-percent chance of at least the amount tabulated; other fractiles are defined similarly.

significant oil discoveries, around 2500 bcm of natural gas was discovered in the region since 2010. This means that undiscovered oil potential in the region is in fact revised downwards in USGS 2021 assessment, but natural gas potential is, in fact, revised upwards by 0.6 tcm. Similar is the case for the estimates for the other fractiles as shown in the Figure below.

basins are different from the Nile Delta basin assessment of the USGS in May 2010. Nevertheless, the Nile Delta basin is still estimated to have the largest undiscovered natural gas potential. Almost half of the undiscovered natural gas potential in the Eastern Mediterranean is estimated to lie in the Nile Delta basin. It is followed by the Levantine basin and Eratosthenes Platform.

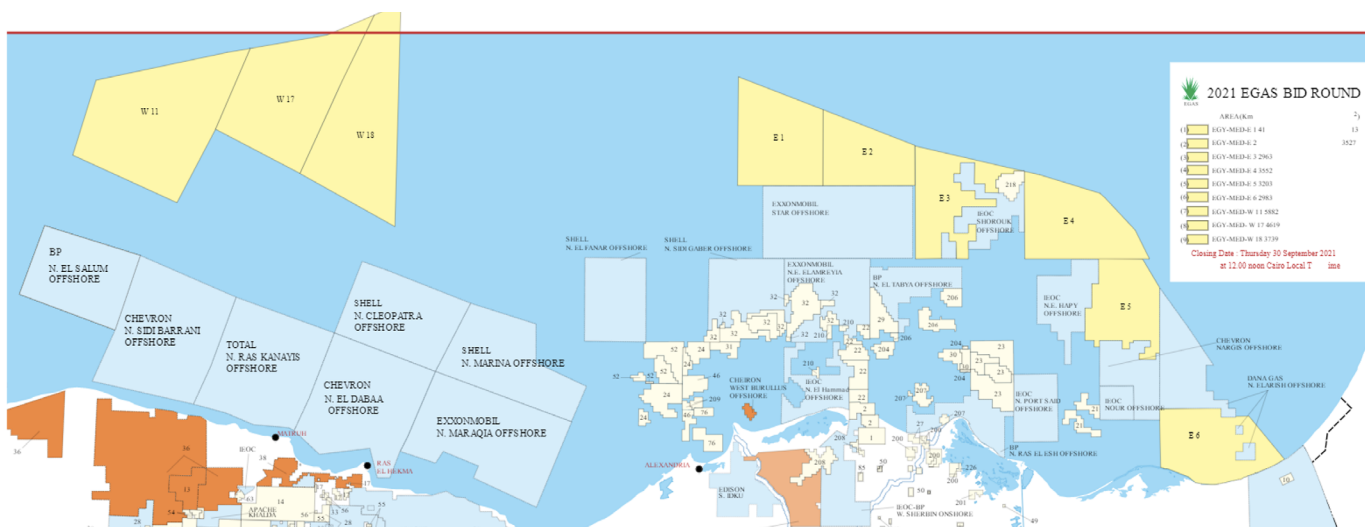
The USGS 2021 assessment is conducted for five basins. Of these, the Levantine Basin boundary is the same as the USGS assessment in March 2010. The boundaries of other

It is important to note that the majority of the Mediterranean Ridge and the Herodotus basin has been assessed for the first time by the USGS. Despite the high hopes for

**Figure 4: USGS 2021 estimates for the undiscovered natural gas resources by basin in the Eastern Mediterranean**

**Source:** Author's elaboration, based on USGS 2021

**Figure 5: Egypt's concession map in the Mediterranean Sea**

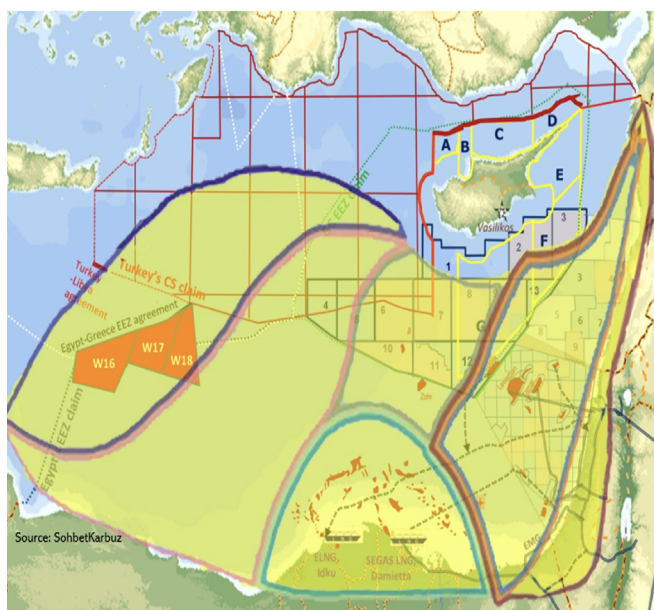


**Source: Egypt Oil and Gas**

the undiscovered gas potential in those areas, at least by industry and academics, the USGS estimates were rather disappointing. One of the reasons for this may be the lack of sufficient data and the risk assessment based on biogenic gas in the applied geological model. However, Egyptian government and major players in the upstream oil and gas industry seem to have a different opinion. For instance, major players, such as BP, Chevron, ExxonMobil, Shell, TotalEnergies have obtained several blocks in that area in the past two years. Similarly, Egyptian government has put three blocks in the Mediterranean Ridge to international tender on 17 February 2021. It appears that they have much more optimistic view than the USGS concerning the regions hydrocarbons potential.

Parts of the Mediterranean Ridge and the Herodotus basin are also the subject of maritime boundary disputes between the governments of Greece, Egypt, Turkey and GASC. The disappointing estimates for the undiscovered gas resources in those areas might be interpreted as if the overlapping blocks and contested areas are not worthwhile the geopolitical struggle. This kind of reasoning, however, misses the whole point – the dispute is not about the hydrocarbons resources, it is about national security and sovereign rights.

**Figure 6: The USGS 2021 assessment area in the context of maritime boundary disputes and overlapping exploration blocks**



**Source:** Author's elaboration

In sum, there is no doubt that the Eastern Mediterranean has substantial hydrocarbons potential. However, a large part of the region still remains under- or unexplored and the speed of exploration have been uneven among the countries involved. Much needs to be done to better estimate and unlock the remaining hydrocarbons potential of the region.

# Fashion Mountain

Başak Bozoğlu 

Fashion is a massive sector that changes very quickly according to seasonality, popularity, and other sectoral trends in the world. The fashion industry includes special designs (haute-couture) and fast fashion that will offer different economic alternatives for consumers. Fast fashion presents the collections of famous fashion brands to the people at a much cheaper cost, much faster, and in large quantities at a much lower price, such as H&M, Stradivarius, ZARA, etc. Although fast fashion offers people the opportunity to follow fashion inexpensively, it causes irreversible effects on nature.

Last week, Chile was the newest and scariest example of fashion's impact on nature. The Atacama Desert, the driest desert in the world in Chile, is exposed to significant pollution due to the disposal of at least 39,000 tons of second-hand or unsold textile products. It has been stated that hundreds of thousands of tons of discarded textile products cause mountains of garbage in the Atacama Desert.

One of the reasons is that, over the last decade, the pace of production has increased with child labor and low wages in the clothing industry. An increasing number of people are working in fashion production because production costs are falling with the use of oil. The sector has grown gradually, especially using polyester, spandex, acrylic, and elastane which is a petroleum product, as a raw material in the fashion sector with cheap labor. This situation increases the speed of production and consumption. If the fashion

industry's production speed continues in this way, by 2050, 20% of the world's oil consumption will be used only by the fashion industry. It means that twice as much carbon as the entire country of India produced in 2018. Moreover, The U.N. Alliance for Sustainable Fashion Report demonstrates that industry consumes around 215 trillion liters of water per year and causes approximately 2-8% of the world's greenhouse gas emissions.

The incident in Chile is one of the clearest examples of the situation. Non-recyclable and unsustainable products which are produced by petroleum are not accepted by other states, and eventually there are fast fashion products from all over the world in Chile. The founder of EcoFibra claims that the main problem is that the clothes are not biodegradable and contain chemical products, so they are not accepted by the municipalities of other countries or cities municipality. Also, it takes 200 years for non-recyclable clothes to disappear in nature. In addition to creating a mountain in the middle of the desert, clothes also increase environmental pollution and chemical exposure, as they are not biologically degradable. The solution for Chile has not yet been announced.

The production from renewable natural materials is, of course, possible with today's technology. Some fast fashion brands have started to change petroleum materials with sustainable materials. For instance, H&M demonstrated a new collection, 'I am Co-Exist', in Paris last week. In the collection, patented, renewable, and natural rubber material



called Yulex has been shown as sustainable material instead of petroleum products. Also, FLWRDWN™, an alternative to animal hair, and VEGEA™, a plant-based alternative to oil-based and animal skins, are examples of newly introduced materials. SpinDye, on the other hand, was introduced as a new generation way of dyeing recycled polyester, which creates colors with 75% less water, 90% fewer chemicals and 30% CO2 reduction. The collection's significance is to show that it is possible to recycle polyester with technology and use natural waste materials instead of petroleum in the fashion industry. However, how and in what quantity this can be used all over the world is still a question mark.

One of the best examples of sustainable fashion in our country is the WWF Market (World-Wide Foundation). The company, which produces in Turkey using 70% GOTS certified Organic Cotton and 30% Recycled Polyester, created an alternative option for young people. The brand not only draws attention to endangered animals but also offers products that clearly indicate how much water is saved in every product you buy. The most crucial point is that the understanding of sustainability is not limited only to the use of materials. They try to provide recycled, environmentally friendly services to customers from fabric, dyeing, printing and sewing, transportation, sales, and product maintenance. People may be aware of their choices when shopping and may prefer such brands made of organic cotton products that produce eco-friendly, recycled products to raise the sustainable fashion trend.

Even if the industry takes a long time to change, people's individual preferences can change many things. November is a month known as Black Friday, which is known as a discount month all over the world and leads people to shop much more. Black Friday is a shopping concept that started in the USA and took place the day after the American Thanksgiving holiday. According to statistics, only in the U.S., people spent \$14.13 billion in online sales in 2020, and that's \$9.03 billion spent on Black Friday. The desire for more shopping, which has increased with social media, requires being more careful, especially during such popular discount periods. Although Black Friday creates a big economic movement on its own, it causes more clothing surplus in the world. In this regard, people need to get more used to buying environmentally friendly products that they can use for many years when they need it.

The fact that people buy most of the things whether they need or not need, especially on the discount day, causes huge fashion garbage from all over the world. When people shop more consciously, the more accurate and environmentally friendly production increases, there will be less impact of fashion on climate change and the world. The transformation of brands and the increase in the number of conscious consumers may prevent the formation of mountains of non-recyclable clothes. As a result, we are in the right week to really question something before buying it for our planet.

# Misconceptions about Energy

Halil Öztürk

Energy is a comprehensive topic, a word about which, in our daily lives, we see, think of, and talk. In popular usage, the term “energy” is used in many other ways. You say, “There is a different energy in this place,” or “I am totally out of energy.” These statements appear to be about energy but obviously have different usages of energy due to the large scale of what the word triggers in our minds. Ergo, in addition to this kind of ambiguities, some other reasons such as the media’s explanation of some terms related to energy, based upon personal observations, there are some “misconceptions” about energy in the society. In the following paragraph, we shall see some of these mistakes and give the correct versions.

As seeing the mistakes, we will go with bullet-points:

The words energy and power are in daily life used interchangeably, but actually, power is defined as the energy used per second, the rate of release.

Maybe you may think that it should not make a problematic difference to use in daily life, but it could be better to take the following equations into account:

- Energy per gram:

\*Butter is equal to about 11 times TNT.

\*Chocolate Chip Cookies is equal to about eight times of TNT.

\*Coal is equal to about ten times of TNT.

Probably, the numbers surprise many people who are not interested in related physics topics because we all know that TNT is by far more explosive than a chocolate chip cookie, but TNT has by far less energy than the cookie, but the reason why these equations hold is a result of a simple equation:

$$\text{power} = \text{energy} / \text{time}$$

Power is not directly related to energy, but it is a function of both energy and time.

- At times, we heard, “The temperature is below absolute zero.” Firstly, the definition of energy and heat: energy is anything that can be turned into heat; heat is the microscopic energy of motion of vibrating molecules, which raises the temperature of a material. Temperature can be measured with different scales such as Celsius, Fahrenheit, and Kelvin. If we use the adjective absolute, however, we



should use the absolute temperature scale, which Kelvin scale. Being below absolute zero simply means a kind of having negative movement of the particles. Ergo, it is not possible to have a temperature below absolute zero. The reason why we sometimes see, hear or read something below absolute zero is due to different interpretations. Zero degrees in Kelvin scale is equal about to -273 degrees in Celsius scale, for example.

- At first glance, the following claim can seem right: "the sources of wind energy and solar energy are different." Nonetheless, in fact, both of them are gotten through the Sun. When we say "solar energy," probably most of us think of the sunlight energy converted into electricity via solar cells when we say "wind energy," the energy coming from the movement of wind converted to electricity via wind turbines. By definition, wind occurs due to the heat difference between the parts of the surface of the Earth, which means wind power ultimately derives from solar.

- Especially in recent years, when the debate on carbon footprint has been hot, we can an idea blaming China which is one of the most harmful countries to nature due to its burning a great number of fossil fuels to furnish its own

energy demand, especially coal. Interestingly, it is China in some sources mentioned as the world's leading country in electricity production through renewable energy according to the IEA .

-Hydrogen is sometimes thought of as a source of energy, especially due to the recent technological improvements in energy generation. Hydrogen is not a source of energy; it is only a means for transporting energy.

-Energy is always conserved. Sometimes, we see some cases in which energy is getting off; in correct usage, energy does not get off but just converts into another form, usually heat. However, not all forms of energy, of course, have equal economic value. When we are told to conserve energy, it is actually "conserve useful energy," and usually, heat is seen as the least useful form of energy.

To conclude, in this paper, I have tried to give and correct some right known mistakes about energy. Probably, the number of mistakes we make is much more than these ones, but these are the ones. If I accept my environment as a sample, I have observed around a lot.

# Inflation: OPEC and Oil

İbrahim Halil Aslan 

Almost every day, we complain about why these prices are increasing at such speed or whether this increase is permanent or temporary. A few days ago, on November 10, the Consumer Price Index (CPI) of America for October, was announced. The yearly increase is 6,2%, the highest number for over 30 years. As we go into detail of the data, we immediately observe that the most - weighted item in CPI is "energy." "Energy" that specifically drives inflation accounts for 30 percent of the total increase in inflation alone. This is a big and substantial increase and horrific contribution to CPI.

At a single glance at the weight of the items of CPI, the highest number, 59.1, attracts attention. It belongs to "Fuel Oil" under the "Energy" category. This increase puts pressure on the cost of all types of oil-related - production and increases the cost of living on the land. Therefore, we have heard the United States president Biden complaining about having high fuel oil prices and invited Organization of Petroleum Exporting Countries (OPEC) countries to take any action to increase their oil production and relieve the market. Biden seeks a way to deal with these rising energy costs. He stated that:

"Inflation hurts Americans' pocketbooks, and reversing this trend is a top priority for me. The largest share of the increase in prices in this report is due to rising energy costs." Here is a comment of Professor of Economics Jack Rasmus in Saint Mary's College about Biden and the situation:

"Already home heating oil price is up 59 percent, and home gas heating is up 28 percent. It is going to get worse as the winter comes. Some economists are projecting heating costs for homes will increase 100 percent by the winter. That's a big problem. I do not see how much he (Biden) can really do about it. He is talking about maybe opening the petroleum reserves, but that's not gonna have much effect."

Since the main driver of the inflation is specifically fuel oil, what the OPEC says in its monthly reports carries much more importance than before in terms of the production level they will determine and what they forecast about the future. A few days ago, 10 November, OPEC's monthly report for November was published and it revised some of their predictions regarding forthcoming days and months. OPEC cut its world oil demand forecast for the last quarter of 2021. The report highlights that especially from the beginning of 2021 until the end of 3 quarter of 2021, the oil demand has



always been slightly higher than the total oil production made by non-OPEC liquids and OPEC itself. It may somewhat explain why there exists upward pressure on oil prices up to now. Also, this is not surprising because demand for almost everything has risen due to an economic recovery of around 6 percent worldwide in 2021, which is the highest increase of the last 50 years. Nevertheless, for the fourth quarter of the year, the report is, as a revision, projecting a little bit downward movement in demand so in the prices. This downward revision is mainly driven by the slower demand than anticipated from India and China in the third quarter.

Also, because of elevated energy prices, a slowdown in economic growth is more likely in the last quarter of 2021. However, the demand momentum will increase for the first quarter of 2022, and the demand will remain strong for upcoming quarters in 2022. Gathering world oil production and demand under one umbrella gives a more comparable picture of what will happen in the next months. It introduces the gap between demand and production to shrink by 2022 and then to extend from the point where total production passes the total demand. After all these projections and predictions, the final effect on the market will conclude our writing. Both the prices of WTI and Brent will be assumed

to decrease through the next year, as the Federal Reserve Bank of Dallas estimates.

Let's turn to Biden. After the whole evaluation I did on this paper, Biden will relax by the sides of OPEC, especially for 2022. As it can be understood, oil production will gradually increase and pass oil demand, indicating downward movement in the prices. (demand < supply) It seems from the limited but significant points I specify that energy will not be as much of a problem in the next year as it was that year in terms of contribution to CPI.

On the other hand, a new concern is uncovered: The rise of inflation could impact Biden's push nearly two trillion dollars social and climate change plan, which is the main focus of the Glasgow Climate Summit took place at a few times ago, said in some environment as the last chance to handle of the climate change. It seems that soaring inflation affects not only energy prices current days but also somehow people's whole life tomorrow, the natural habit of the whole living creatures, sustainability and stability of the world in the future.



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