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BRENT OIL

112,09 \$/BL

GASOLINE

19.11 ₺/LT

USD/TRY

14.65

DIESEL

22.15 ₺/LT

EUR/TRY

15.83

FUEL OIL

14.49

Environmental Impacts of Energy Use in Turkey

Büşra Öztürk 

According to International Energy Agency (IEA) 2021 Energy Policy Report, Turkey's energy supply has increased by 92% since 2000. Despite a growing supply of renewables over the last decade, the majority of it is made up of fossil fuels, meeting 90% of total energy demand. We rely heavily on imported fossil fuels. Natural gas is imported at a rate of 99%, oil at a rate of 93%, and coal at a rate of 58%. In 2019, the proportion of fossil fuels in all energy sources fell to 83%. The primary cause of this decrease is the increased production of renewable energies such as hydroelectric and geothermal.

Although renewable energy investments are increasing, the decrease in the CO₂/population ratio is not as rapid as in other countries. For example, while the decrease in CO₂/population ratio in Turkey is limited to 0.32 between 2016 and 2020, the decrease in many European countries is greater than 0.5 between these years. When the causes of the slowdown in emission reductions are investigated, it could be observed that renewable energy systems are not designed with considering environmental precision sufficiently.

For instance, Turkey has increased its use of renewable energy, particularly geothermal energy, by 36% in the last

decade. According to Global Status Report 2020, Turkey ranked fourth in geothermal electricity generation, second in geothermal heating, and third in solar water heating systems globally as of the end of 2019. A commonly known approach to geothermal energy is that it is a clean and reliable energy source in terms of greenhouse gas emissions into the atmosphere during power generation. However, geothermal power plants in Turkey that use high-temperature fields may emit high levels of CO₂. An interesting fact is that the CO₂ content of geothermal wells in Turkey is nearly as high as the emission factors from coal-fired power plants.

According to a World Bank investigation into CO₂ Emissions from Geothermal Power Generation in Turkey, CO₂ emissions from 85 geothermal power plants worldwide have a weighted average of 122 g/kWh. It is reported that a weighted CO₂ emissions average of 887 g/kWh using 2015 data from 12 geothermal power plants in Turkey, is far higher than the global average.

Another cause of devastating impacts of energy use on the environment is coal and lignite-fired thermal power plants serving as the primary source for electricity generation. These power plant chimneys emit local pollutants such



as fly ash, sulfur dioxide, and nitrogen oxides. Pollutants cause pollution by affecting receptive environments such as air, water, forest, and soil, and inhaling them poses significant risks to humans and other living things. Some decontamination units can capture pollutants, but their use is limited due to high costs and a lack of enforcement. Furthermore, cooling water discharged from power plants pollutes the surface and groundwater. However, oppositely all of these negative impacts, coal exploration activities have increased, and efforts have been made to increase the share of domestic resources in production in the last five years. Likewise, hydroelectricity is serving for electricity generation as a secondary source. The water retention systems used in hydroelectric power plants also harm vegetation, wildlife, and local residents since the country's rich biodiversity are extremely vulnerable to climate change.

Turkey's total greenhouse gas emissions in 2019 were calculated to be 506.1 million tons of CO₂ equivalent, with the fact that the country is one of the world's major energy consumers due to its developing economy. This amount is equivalent to about 1% of total global emissions and Turkey ranked as the world's 20th largest emitter of greenhouse gases. In line with the global picture, energy-related

emissions account for the lion's share of Turkey's emissions at 72%.

The environmental impact of renewable energy sources is relatively low when compared to fossil fuels, but it is not zero. In this respect, it is critical to adequately inform the public as well as prepare and thoroughly inspect environmental impact assessment reports. However, there are currently no regulatory limits in Turkey for CO₂ emissions from geothermal power plants or other renewables, and it is not required to monitor or report their emissions.

In comparison to previous periods, Turkey has taken more radical steps in terms of climate priorities, and the general trend can be said to be parallel to global climate trends. Infrastructure and support studies are ongoing in order to achieve a greener and more environmentally friendly system in the energy sector, as well as in many other climate-related topics ranging from waste management to forest protection and effective water resource management. However, it is very significant to design and implement energy systems in the most appropriate way with rational evaluation in terms of quality and quantity, in terms of reducing negative environmental effects.

Climate Crisis in the Shadow of the Russia-Ukraine War

Yaren Öztürk 

The impact of climate change on ecosystems and the damage it causes to biodiversity continue to pose significant threats to all humanity. As the war between Russia and Ukraine enters its second month, countries seem to have stopped considering and taking action to achieve their climate goals for a while. Countries are now reviewing their priorities and policies in many areas. As long as the main topic of the political agenda continues to be the Russian occupation of Ukraine, it seems that the investments made to weaken the effects of the climate crisis may be overshadowed by military spending for the time being.

A few days after the start of Russia's invasion of Ukraine, United Nations, publishing The February Intergovernmental Panel on Climate Change report, revealed how climate change has affected the lives of billions of living creatures and how perilous way it has exterminated nature. The report stated that the impacts of the climate crisis are incrementing swiftly day by day. In addition to that, the United Nations secretary-general warned that if countries expand their use of fossil fuels instead of transforming to green energy due to Russia's growing aggression, reaching climate goals will become unattainable. He also added delays in reaching set climate goals would result in death.

After the turmoil created by the war, the report innately did not attract enough attention and was ignored. Nonetheless, environmental organizations tried to seduce attention to the report afterward. On the other side, Russia's invasion of Ukraine showed how high the fossil fuel dependency of European countries on Russia is once again. Although the European Union charges sanctions on Russia and Putin in multiple areas, it still does not charge any sanctions in the field of energy and maintains buying natural gas from Russia. As Oleg Ustenko, the economic adviser to Ukrainian President Volodymyr Zelensky, recently stated, the world is financing Putin's war by paying Russia \$700 million a day for oil and \$400 million for natural gas.

Since invading Ukraine, Russia, the world's largest exporter of fossil gas and oil, has sold more than 11 billion euros of fossil fuels to the European Union for heating purposes, starting car engines, and generating electricity. A short time after Russia invaded Ukraine, the European Union declared plans for more rapid installation of wind turbines and solar panels to accelerate the transition to renewable energy. Germany remarked that it had allocated 200 billion euros by 2035 to decarbonize its electricity supply. However, there is still no reduction in fuel taken from Russia. On the other hand, countries are looking for new ways to replace Russian



gas with fossil fuels from other countries to decrease the fossil fuels bought from Russia. The ongoing war and the policies implemented by the governments are acquiring various criticisms from environmental organizations. Climate scientists entitle the war between Russia and Ukraine as a fossil fuel war; they emphasize that not ending this dependency will be an obstacle to achieving climate goals.

To what extent the continuing war in Ukraine damage is made to the environment is not entirely determined yet. According to the Central Asia-Caucasus Institute & Silk Road Studies Program's research, after the Russian army entered Chechnya, Russia contaminated 30 percent of Chechen lands. The environmental conditions in the region have not been reached a sufficient level still today. Half of the agricultural lands in Chechnya are still not in a proper condition to be cultivated. According to a recent Action on Armed Violence (AOAV) report, about 36 mines were submerged in the Donbas region of Ukraine. The mines likely released methane gases and heavy metals into the water, which means that water pollution in Ukraine will increase. Furthermore, the Ukrainian city of Mariupol, which is the scene of hot conflicts and is still under Russian

blockade, worries environmentalists about the damage that will spread to the environment if the possibility of damage to iron and steel factories. The increasing emissions because of military activities, debris and toxic wastes caused by the destruction of industrial and fuel storage facilities, and water and soil pollution caused by heavy metals are growing daily as the war continues. Considering the devastating effects of the Russian military's bombs and chemicals on crops, farmland, and wildlife, it may take decades for Ukraine to recover.

Although the effects of the climate crisis, which will perhaps be felt more profoundly after the war, are not at the top of the countries' agendas, it is necessary to comprehend that this is a temporary situation. Although the ongoing war in Ukraine has conveyed the case to an insoluble point, even relatively small contributions from the rest of the world are of great importance in the battle against the climate crisis. For example, according to the data of the International Energy Agency, the thermostat in a house in the European Union countries is above 22 degrees Celsius on average, and lowering it by even 1 degree will reduce the gas demand by 7 percent. Every step in this context will be hopeful for a more livable world and generations.

Russia-Ukraine War and Its Impact on the Environment

Gülce Özdilekcan

The situation of Russia-Ukraine War has many social outcomes, as we have all followed from various news channels. We have watched countless homes being destroyed, people forced to fly away from their homes, many ghost towns which used to be cities, and many more. It wasn't surprising to observe many casualties, other than the troops of Ukraine and Russia. The victim of the war is, doubtless say, the young, children, old, and all the people who were in the war zone. However, the environment and the other species living in the war zone is the other victim who is not obvious at first sight, yet vital.

"The environment has long been a silent casualty of war and armed conflict. From the contamination of land and the destruction of forests to the plunder of natural resources and the collapse of management systems, the environmental consequences of war are often widespread and devastating," said Ban Ki-Moon, the former Secretary-General of United Nations (UN), on the International Day for Preventing the Exploitation of the Environment in War and Armed Conflict. The environment has also been one of the casualties that we don't usually rush to protect at first sight. However, I think that the environmental effect has a huge long-term effect on the human factor, which we seek to protect at first sight. The environment doesn't have a

nationality; however, we mention this war as a war between two states. Other species also doesn't have a chance to fly away from the war zone. Therefore, we have to think about the environment after the war is over.

What Are Experts Saying About the Environmental Effect of War?

Before the war happened, Ukraine had transformed from an agricultural to an industrialized country throughout the years. Therefore, war poses larger threats to the environment. If Ukraine were still an agricultural country, outcomes would be less significant. However, in industrialized areas, "Russian forces have used explosive weapons with wide-area effects in large, populated areas. Russian airstrikes have cut off many urban residents' heat, water, and energy."

This makes the war more concerning for the environment because the weapons that the Russians used caused spread into the soil, water, and the air. For example, in the war zone, a power plant was targeted by the Russians, which caused huge pollution, which is unreversible in the short term and probably causes different threats in the long term. Experts often evaluate the long-term effect of the war as it will be like the Chernobyl situation in the 1980s, and its



effects will last for decades. Even though it has effects such as refugee problems, the lack of clean water because of the high amounts of arsenic and lead released into the soil and the water for the ones remaining in Ukraine will cause disease outbreaks.

Also, Ukraine has a very special geographic region, which holds over more than 70,000 endemic species, including animals and plants. Some regions have rich water resources, enabling these species to last for centuries. However, doubtless to say that the richness of these species will decrease with the highly polluted main water resources caused by the weapons used by Russia. This will also cause the food resources to decrease in Ukraine, where there is still agricultural production, especially timber.

Solution Proposals

On 24/03/2022, the European Union (EU) accepted a resolution on the economic, social, and environmental effects of the war. As can be predicted, even though there are different points of view around the world about the conflict, the EU is on Ukraine's side. Therefore, the recommendations on the resolution regarding protecting Ukraine. They stress the importance of the help of other EU members to Ukraine since their environment has been

affected a lot. They have mentioned their will as "EU must help protect and restore environmental damage caused by the war and sanction environmental crimes(...)." They are also concerned about the nuclear safety of Ukraine and seek help for protection, which can also cause greater problems for the environment. They are mainly seeking the unity of the EU to help Ukraine with further environmental problems.

Ukraine is, for sure, seeking help in this ongoing conflict for many reasons, and the environment is one of them. However, I think that even though asking for help is effective to some extent, it looks like a band-aid for now. What has happened cannot be taken back, but preventative measures for the damage that has been done can be obtained. Seeking help is one step, but the damage that has been done in Ukraine won't affect the country itself only. It will have long-term effects that will affect the other parts of the world, not even only environmentally but economically and socially. Therefore, by focusing on how to protect what is left with awareness from other countries as well, the future of Ukraine would be more bright.

Energy Crisis: What is Different This Time?

Bariş Sanlı 

We may safely claim that we are already inside one of the major energy crises of our generation. Before it loomed over us, the resemblance was the 1970s. Now, however, there are minute but fundamental differences. The 1970s were the product of producing or oil-exporting countries' policies based on geopolitics. 2008 price peaks were due to China's demand growth. Now there are two parts to the recent events. One is the already continuing commodity market tightening, and the other is the additional effect of a war.

This is easy to understand. But there are other forces. Starting before the Gamestop-RobinHood events and the rise of options trading, the world has known the Financial Weapons of Mass Destruction. The 2008 crisis was claimed to result from excessive speculation on the financial side. This one is an upgrade to 2008 dynamics. So the leverage in the markets can be higher than before. But this leverage needs fundamentals to become a destructive machine. For the recent crisis, the major fundamental is the "volatility trap," as Jeff Currie from Goldman Sachs has labeled it.

The volatility trap is the impossibility of investment in a volatile environment, feeding into more investment deficits and volatility. He offers to use carbon prices than the failed ESG rules. You can print money overnight, but you can not print oil, gas, copper, or aluminium.

The current energy transformation is a big change in the minerals used. Instead of oil, gas, and coal, we are talking

more about copper, aluminium, lithium, and other clean tech minerals. Technology is fundamentally different, but the reliance of this technology on minerals is more than ever. This transformation is a big CAPEX (capital expenditure) transformation. Like a bridge, we are traveling from one CAPEX-hungry realm to another. The balance will be difficult.

A geopolitical premium of the whole event had not been realized yet. The food and fertilizer price problems are more fundamental than the energy dynamics. Previously we have seen underdeveloped governments limiting fertilizer imports for the trade deficit, resulting in ever-higher food prices. Food prices are the root cause of all evil instabilities. So this process will be ongoing until 2023 and probably 2024.

What is to happen next? No one knows, probably will never know until we live the day. But every generation has its own problems, tests, crises, mistakes, failings, innovations, and victories. This is the norm of civilizations. The early signs are not optimistic for the next six months. Afterward, the resilience of the world will be the judge. Absent an economic recession, and investments may not realize in 1 or 2 years. This means the volatility trap may last longer than the 2022 crisis. The only way out is more investment in minerals. Financial markets should be ready to reorient their goals to save the world from a different perspective.



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