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12.32

# Will Europe Leave Its Comfort Zone for Ukraine?

Gökberk Bilgin 

On February 24, the Russian army began its military operations in Ukraine. The United States, the United Kingdom, and the European Union announced comprehensive sanctions against the Russian Federation, yet they were reluctant to impose energy-related sanctions. When the German government announced that they were withholding the Nord Stream 2 project, Dmitry Medvedev, Deputy Chair of the Russian Security Council, tweeted that Europeans should be ready to pay €2.000 for 1.000 cubic meters of natural gas.

The Nord Stream 2 pipeline was built in recent months. It was not operational because the German government was still working on the licensing procedure. The pipeline was not planned to transfer gas before the last quarter of 2021, so pausing the project was not mean reducing the gas imports. On the other hand, The Nord Stream 1 pipeline was remained open, and gas flow has continued since the beginning of the Russian offensive. Moreover, the European countries continued to buy Russian gas even through Ukraine with increasing amounts. The fear of increasing gas prices in the future made this transaction economically logical for the Europeans. However, this also meant that Russia keeps being paid \$350 million every day for its energy supplies,

increasing further if the oil prices continue to go up.

The comprehensive sanctions to stop the Russian advance in Ukraine mostly target financial transactions and the Russian economy, excluding the energy sector. The German government, initially opposed to banning Russian banks from the SWIFT system, agreed to implement these sanctions but exempted some of the banks for the energy payments.

The first energy-related move happened when major oil company BP announced that they would be giving up their shares in Rosneft due to Russian aggression. This was an important beginning for the major oil companies to show that they were ready to lose earnings to stop Russian advance. The estimated cost of the policy is calculated between \$15-25 billion for the company, yet it is not clear who BP would sell these shares to and how the transaction will be fulfilled due to the financial sanctions. However, despite these problems, this move also led other energy companies, Shell and Exxon, to announce exiting their operations in Russia. Only the French energy company Total claimed that they would stay but no longer provide capital for new projects.





Stopping or even reducing Russian oil and gas imports can mean devastating consequences for the European economy and community. Today, Russian gas covers 1/3 of the European demand, and getting rid of them means, even more, increasing electricity and fuel prices that will have create unrest in the society. It can also mean postponing the climate projects, burning more coal, and reopening the nuclear facilities that have been closed for the sake of green energy. The dynamics of the energy transition can change on deciding the amount or type of renewable energy projects that will be supported.

Thanks to the successful media management of the Ukrainian president Volodymyr Zelensky and the resistance of the Ukrainians, people in Europe are now raising their voices to show that they are willing to suffer by not consuming Russian gas. It should have been the other way around that the Ukrainian resistance should have increased with Western support. Yet, we see that the support of Ukrainians escalated as they held on against the Russian forces. However, it should be noted that it is naïve to declare a Ukrainian victory just because they couldn't be defeated in just one week.

When we look at the Russian side, it seems as the government officials are confident that the gas and oil demand of the Europeans will not be affected by the war in Ukraine, and they are openly sharing their thoughts on social media. Yet, despite receiving major sanctions from the West, they are not retaliating by disrupting the energy supply. In social media and TVs, many specialists and invited guests to discuss whether the Russian government acts rationally or not and whether they have been correctly calculated the amount of damage they will face by sanctions. Time will show the reality. But having too much confidence in the gas demand could turn into a Russian vulnerability if the sanctions suddenly include energy trades. This will also show that the Europeans are willing to lose their comfort zone of receiving vital energy sources without disruption to save Ukrainians. Unlike other sanctions, which put a major financial burden on the Russian economy, energy sanctions, if implemented, will become a heavy burden for the Western economies to stop the Russian offensive. The result of this hostility between the Western powers and the Russians will not be decided on who will hit the hardest but will come to who can get hit and keep moving forward.

# Wheat Market: A New Security of Supply Complication

Erkin Sancarbaba 

The Russian invasion of Ukraine is evolving into a geopolitical deadlock, the consequences of which are still unpredictable. Even though this invasion plan has been talked about for years and has been on the agenda of the world public opinion in recent months, the United States and its European allies did not make any concrete efforts to prevent the Russian invasion. The start of this war brought up a new issue as important as the establishment of energy security: assurance of the continuity of the wheat supply. The dependence of the countries in the region on Ukraine and Russia in grain imports has the potential to cause a new crisis. Momentarily, one of these countries is currently under occupation, and the other is in the position of the aggressor. This situation necessitates dealing with supply problems and price instabilities that may occur soon.

The energy crisis that was experienced in Europe this winter has already been the harbinger of the future. Despite this crisis, the majority of European countries have a distant attitude towards energy sources such as coal and nuclear energy. The inability to offer alternatives that can replace the aforementioned resources also poses the risk of chronic energy crises that will take effect every winter in Europe. On top of all these developments, the war between Ukraine and Russia may be the beginning of a new crisis. The capacity

of the two aforementioned countries constitutes about a quarter of the world's wheat production. The war on the Ukrainian soils, which is defined as the granary of Europe, jeopardizes the security of wheat supply to the region. As a result of the price surge that started after the news of the invasion, wheat prices have reached the peak of fourteen years.

The main problem here is that the areas where conflicts intensify in Ukraine are wheat fields. In other words, the intensification of conflicts may hinder Ukrainian wheat production and complicate agricultural exports. Especially when the number of wheat imports of Egypt, Indonesia, Turkey, Pakistan, Bangladesh, and African countries from Ukraine is taken into consideration, it may be necessary for developing countries to find solutions against increasing food prices. Considering that developing countries are already struggling with inflation, disruption of wheat and grain supply will deepen the economic problems already existing in developing countries.

On the other hand, the rise of food prices in Europe should be considered inevitable. Three countries play a major role in Europe's wheat import: Ukraine, Russia, and Canada.



In the situation that the war scenario worsens, Ukraine's export capacity may suffer even more, and imposing sanctions on Russian wheat may come to the fore.

Regarding the realization of the sanctions, Russia can shift its wheat export to China and the Asia-Pacific region, just as it does in natural gas exports. China, with a sudden decision, lifted the restrictions on wheat imports from Russia. The railway infrastructure between those two countries enables the transfer of Russian wheat to China. However, the European Union can't eliminate the effects of a sanction to be applied on Russian wheat imports. It does not seem possible for Canada and the United States to be alternative exporters to the amount of grain sanctioned. In addition, there were already problems in the amount of wheat production due to droughts in countries such as Iran, Syria, Iraq, Turkey, and Egypt. Therefore, it is clear that the war in Ukraine will harm the world economy, which is currently in the recovery phase due to the Covid 19 pandemic and is struggling with high inflation. The inevitable increases in food prices will increase the risk of inflation, especially in developing countries, and will hinder the fight against inflation.

All in all, the inability of the United States and its European allies to demonstrate a concrete will on the existing Russian occupation, which ignores the freedom struggle of the Ukrainian people over the years, will have a global impact. Because the unfulfilled promises that lead the Ukrainian government to make untimely decisions are one of the main reasons for the war in Ukraine. The fact that the current war, which is likely to deepen, interrupts grain and especially wheat production, can cause deep wounds in many economies. Although it has not attracted the necessary attention at the moment, it can be mentioned that there is an issue as important as the continuity of the energy supply. Although it seems obvious that price increases of grains cannot be completely prevented, the establishment of a multilateral and inclusive global mechanism to contain the agricultural cooperation has become an urgent necessity to ensure supply security as well as the gain control over the price. Otherwise, it will be more difficult to create alternatives for consumer countries in the market, which will increase the fragility of the world economy.



# The Steps for a Realistic Green Transformation

Bariş Sanlı 

It is never easy. The transformation of something is not just another target to achieve. But it is a terra incognita. The approach is very important. If you assume this new voyage as a pilgrimage to holy lands, well, that isn't easy either. The expectations will shape the speed of transformation.

The grave mistake is to create an atmosphere of optimism for the green transition. This will echo in the consumers' minds as "a better world" where energy will be cheaper, more abundant, and cleaner. This may not be the intention of the dominant forces, but they are not correcting this skewed expectation. The gratitude of the masses is more important now. But it may backfire.

The biggest hurdle in the green transformation is the growing environmental movement. They have good intentions. But the environmental movement's decisive aim is to leave nature as it is or better than today. Energy is allocating some resources for human development, which may be used for other natural elements. Practically, any energy change in any place is a disturbance for this place,

even for solar energy.

Historically, the strengthening of environmental movements has been tamed by price hikes. The high price of energy shifts the consumer back to realism. Since consumers' original expectation is to have abundant, cheaper, cleaner energy, expensive energy is a big disappointment. It also tames generations in two ways: by teaching conservation and the dangers of dreaming.

The current green shift in energy is due to solar. Germany and China have created and scaled already existing technologies. The same didn't happen with the wind yet. In storage technology, we should wait for solid-state batteries. But practically, we do not have the technologies to have a full-scale transformation economically. We have to be careful. My pillars for the transformation's initial steps are not unprecedented. But here they are:

The first pillar is to reduce the red tape for wind and solar. Governments should put two targets for cutting red tape.



The maximum time for solar permissions should be six months. It should be 18 months for wind. It has to be from a central, specialized dispute mechanism to be solved. Otherwise, no one wants a kindergarten in its backyard. Should we respect this? If I was a fatalist, my answer might be different.

The second pillar is to overbuild these resources. The third one is electromobility. The fourth one is nuclear or other net-zero baseload technologies. Closing coal plants will not work since it will create moral hazards because governments have to pay these plants for closing. It is like paying people to stop dumping waste into the sea. You have to let coal generation be uneconomic. To achieve this, you have plenty of low-cost renewables. This will be less costly.

The other issue is grid strengthening measures. Electrification of the system is not easy. But maybe cheaper than hydrogen networks. This will certainly increase the grid-related costs in consumer bills. The problem is the structure in which the grid institutions are managed. They

have to be top-notch drivers of this transformation. State-owned grids are failing. We need new, open-minded, innovative grid institutions.

But the fundamental pillar is telling the truth to the consumer. People do not forget bad memories. If this becomes the first net-zero crisis of the modern world, there may not be a second one. China is probably increasing coal plants in India and the rest of Asia. But they keep publicizing their green targets far away.

There is a new wave of green wailing: put the green targets on the table build more fossil plants under the table. This is pretty easy because most green transformation news is publicized by desk-based research with Google and Excel. So they cut the relation between the internet and field.

Friend or foe, everyone is an expectation engineer now; telling the truth has never been harder. But consumers had to know. It is the end of cheap energy for years to come.

# Are We Mentioning Enough About Underwater Noise Pollution?

Gülce Özdilekcan

While we think of an enjoyable Saturday morning, we think of a warm cup of coffee, a nice and prolonged breakfast, nice music playing in the background, the sound of changing the page of the newspaper, and so on... Suddenly, we hear the traffic noises and maybe an accident. In the neighborhood, they decide to continue the construction and start to bring the construction vehicles. It is vivid how disturbing it can be. Think of it as it is under the ocean, and you are disturbed by these sounds repeatedly throughout the time, and you start to lose your hearing ability, which is your only survival mechanism.

Even though we have been familiar with the ongoing problem of noise pollution surrounding us for years now, as I was researching, I came across underwater noise pollution, which is more of a trending topic these years. It can also be called ocean noise. The US National Ocean Service defines it as "sounds made by human activities that can interfere with or obscure the ability of marine animals to hear natural sounds in the ocean." These sounds may not be heard or recognized by humans, making it less of a known environmental issue.

There are various ways ocean noise can be created. Shipping, recreational boating, and energy exploration are some

of the causes defined by the US National Ocean Service. Also, industrial fishing, coastal constructions, oil drilling, seismic surveys, warfare, sea-bed mining, and sonar-based navigation are some undercover reasons for ocean noise. Even if these underwater activities have not recently started, the impact of underwater noise pollution has been a recently searched topic. However, it has been estimated that underwater noise pollution has been showing its impact for over a century now; with the overall improvement in marine technology, it has shown more impact on ocean life.

## How does ocean noise affect marine life?

Firstly, the noise created in the soil and the water has different effects. The range of the noise is different. For example, we as humans don't hear the traffic sound from kilometers away; after some range, we cannot hear those types of sounds. Also, the buildings, the trees, etc., can block the sound. However, in the water, the magnitude and the range of the sound created differ as well. It has a larger effect on the perimeter; therefore, it travels more.

The main problem that doesn't affect humans may be, however, "noise can travel long distances underwater, blanketing large areas, and potentially preventing marine animals from hearing their prey or predators, finding





their way, or connecting with mates, group members, or their young.” Throughout the years, it has been observed that the population of the underwater mammal species has decreased due to ocean noise disturbing their way of communication. Invertebrates have also been affected, and most of the fish species have shown stress behavior, such as leaving their homes, which resulted in decreased fish populations.

#### **What is Done So Far?**

International Maritime Organization has written a resolution (RESOLUTION MSC.338(91)) and set some boundaries and regulations for the sake of reducing ocean noise. This resolution was written in 2012 in the International Convention for the Safety of Life at Sea (SOLAS). This resolution was written regarding the Code on Noise Levels on Board Ships, set by IMO again. These regulations consist of technical regulations for both constructions and the regulations of the ships. It also sets the maximum amount of noise a ship can produce. Apart from these, IMO has published guidelines and manuals to control ocean noise. However, it is still open to arguments because IMO cannot force any state to comply with the regulations. It can only give advice. Therefore, some member states of the UN may not be fully dedicated to solving environmental issues. Still,

there is an effort, but I am not sure if they can be the solid answers to the problem. With a similar approach, in 2019, WWF has made their supporters sign a petition in the Arctic Council, which acts as a “pinky promise” not to create ocean noise and obey the guidelines and research about the issue. I interpret both as precautions but not the solid solutions for the issue.

Talking about legislation, governments are confused as well. While international organizations can set some “advice,” governments’ power of legislation is, of course, more powerful and impactful. However, surprisingly, even though this is a serious issue that needs to be acted upon, governments are in a dilemma between economic and political outcomes and environmental outcomes. They are often concerned about the commercial aspect of ocean life because if they apply the experts’ rules, the profitability of the oceans will decrease as well. The ocean noise is only a problem caused by water activities, but it also can be caused by offshore activities such as agriculture in those areas. Restricting these activities will cause a burden on the government as well.

# Reducing Carbon Footprint with SPP Installation

## IDV Bilkent High School Young Spokespersons of the Environment Project

**Deniz Aşıkoğlu, Pelinsu Aydoğan, Ömer Can Baykara, Mete Erdengi, Yusuf Altan Akbaş, Yaman Türköz, Aslı Şahin, Fatma Kaya**

Today, the effects of the carbon footprint on the earth are getting heavier day by day, and the importance of renewable energy sources is increasing. Our country is at a point where there are four seasons and suitable conditions for sustainable energy in terms of geographical location. "As Turkey is geographically located between 36 and 42 North latitudes, it has sufficient solar radiation intensities and durations for solar energy applications in a sunny zone. The annual average solar radiation is 3.6 kWh /m<sup>2</sup> days, and the total annual radiation time is 2610 hours." Despite these advantages, renewable energy, especially solar energy, cannot be used widely in Turkey is the lack of legislation and incentives. The intense and long installation and permitting of Solar Power Plants (SPP) prevents the widespread use of renewable energy. The installed SPP power in Turkey was measured as 7658.6 MW at the end of October 2021. Although the use of renewable energy is economically advantageous in the long run, its contribution to our future is positive. For this reason, it is seen that new incentive mechanisms have been announced in recent years.

496,805 km<sup>2</sup> is sufficient to meet the energy need in the world with solar panels in 2030. Contrary to popular belief, very little surface area is sufficient to produce solar energy, a renewable energy source.

It is possible to eliminate the use of fossil fuels due to equipping suitable areas with solar panels, but insufficient storage technology prevents the implementation of the application. Due to the variability of weather conditions, technologies that will enable the energy produced on sunny days to be stored and used on cloudy days are not yet widely used due to high costs.

On sustainable energy, to reduce the carbon footprint, it is aimed to renew the lighting of a part of our school by using renewable energy sources and thus to contribute to the protection of nature together with the school economy. In addition to this study, it is planned to prepare various questionnaires and presentations to increase the awareness of primary, secondary, and high school students on the subject. The last part of these studies is the meeting with the "Gimnazija in Srednja Sola Rudolfa Maistra" school in Slovenia and the collaborative work to be done as a result of this meeting.

As a first step, plans were made for the lighting in the school's main corridor to be powered by solar panels. In this direction, the feasibility of the points in the school garden in terms of efficiency was made, and a small solar energy meter prototype was prepared with a 6V solar panel. After the study, the project members made a research visit to Gazi University Teknokent. As a result of the information

	Unit	West Front Wall	South Side Wall
Annual Specific Earnings	kWh/kWp	525	510
System Usage Rate	%	50.9	45
Reflection Losses	%	43.8	51.4
Production	kWh/kWp	1189	1155
Forecasted CO <sub>2</sub>	kg/year	555	540
Radiation Falling on the Module	kWh/m <sup>2</sup>	1032	1132

**Table 1:** Simulation created by Ersis Energy Engineers using design and simulation software for “PV Sol” Photovoltaic systems

given by Halk Enerji, it was decided to expand the project. After examining the prototypes of the solar panels and evaluating the economic factors, it was decided to use panels that would produce a total of 2kW of energy for the school's main corridor. To realize the project, Ersis Energy firm and ID Bilkent University Construction Affairs Technical Department started a joint work. Engineers and officials from Ersis Energy, who came to investigate, began by determining where the panel would be placed.

The seven students responsible for the project showed the authorities around the areas where efficiency tests were made at the school. It was determined that the wall at the school entrance was suitable for placing the panels. After the location was determined, the connection of the energy produced from the solar panels with the grid was put on the agenda. In the meetings held with them, it was decided that the fastest result in terms of the timing of the project would be to connect the panels in an off-grid form. Thus, the first steps were taken for the location and installation of solar panels.

In the survey carried out by the project students in high school to raise awareness starting from within the school, it was determined that 136 of the 170 students were aware that "Today, approximately 20 percent of the energy consumed worldwide is obtained from renewable sources".



**Figure 1:** The View of the Installed Panels Designed by Ersis Energy Engineers Using 'Photoshop' Application





In addition, to reduce greenhouse gas emissions by 40% compared to the European Union's 1990 levels; To ensure that 27% of the energy consumed by the EU is obtained from renewable sources, to increase energy efficiency by at least 27%; To reach the 15% electricity interconnection target among EU countries and to complete the internal energy market by advancing infrastructure projects; Renewable energy use targets for 2030 ("Energy-EU's Goals"), which he set as achieving 80-90% reduction in greenhouse gases by 2050 compared to 1990, were found effective by 148 of 170 students.

After the implementation of the survey, more detailed studies were conducted on the functioning of solar panels, the status of carbon footprints in Turkey, the EU, and the world's countries, and the benefits of using renewable energy. As a result, a total of 506 million people in our country in 2019 It has been learned that tons of greenhouse gas emissions are produced, and 399.3 million tons of this number is CO<sub>2</sub> emissions. It was observed that 138 million tons of the 399.3 million tons of CO<sub>2</sub> emissions were caused by electricity and heat production ("Greenhouse Gas Emission Statistics..." ). The research and planning done were shared with the project partner, the school in Slovenia. It was decided to create a joint presentation to raise awareness about the solar panels that both schools can place on their campuses.

To ensure that life on earth is sustainable, it is necessary to reduce the carbon footprint. In this direction, it is of great importance to increase the use of solar energy together with the measures to be taken by each individual. In the following years, reducing the use of fossil fuels as a result of the development and dissemination of energy storage technologies provides economic advantages to a large extent in the long run. While even the use of normal size panels requires less surface area, thanks to the development of new technologies, panel sizes can be reduced, and energy production levels can be increased. Strengthening the infrastructure, making the process practical and functional, with incentives from the government and changes to be made in the installation process of the panels will ensure the widespread use of renewable energy. We should encourage the efficient use of solar energy systems in all countries for the next generations and continue life as individuals, and speed up awareness-raising activities.



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