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Increasing Demand for Renewable Energy in the European Union

Ahmadiya Sarkarov

After the energy crisis in Europe in 2022, the transition to clean and sustainable energy has become more urgent than ever. After the onset of the present stage in the Russia-Ukraine war on 24 February 2022, the number of economic sanctions against Russia imposed by the West has increased dramatically. As a result, Russia—the largest energy partner of the European Union until 2022—reduced the volume of energy exports to the EU. In response to the crisis in the European energy market, which predates the war and has been accelerated by it, the EU Commission presented its REPowerEU Plan.

This plan has three main objectives:

- diversification of energy sources to end dependence on a single source;
- increasing and promoting clean energy production; and
- implementing energy-saving measures.

According to REPowerEU, although short-term plans are related to the diversifying imported energy sources and the reducing deficits (this encompasses the Southern Gas Corridor and plans to double its capacity by 2027), the more longer-term plans concern the transition to clean energy.

Simply put, energy produced from sustainable and renewable sources that does not generate carbon emissions is called clean or green energy. The most important renewable sources are hydro, solar, and wind energy. Hydro energy production has had the largest share among renewable sources in the European energy sector for many years. However, climate change including prolonged droughts threaten the potential of hydro energy production and the long-term sustainability of this source. Therefore, wind and solar power generation in the EU has increased rapidly over the last two decades.

Ahmadiya Sarkarov is an independent researcher on water resources management, environmental policy, and sustainable development. He is a former National Expert for the UNDP-GEF Kura II Project. The views and opinions expressed herein are solely those of the author.

The Importance of Russian Oil and Gas in the EU Before the War

Starting from the 1960s oil and gas originating in what is now Russia was a vital source of hydrocarbon energy in what is now the European Union. Thus, in 2021, Russia supplied approximately 45 percent of the EU's total gas imports, 27 percent of its crude oil imports, and 46 percent of its coal imports. According to date from 2021, 76 percent of the EU's energy consumption was provided by these fossil fuels (34 percent gas, 31 percent oil, and 11 percent coal).

However, even before the war, one of the EU's declared aims was to reduce dependence on Russian energy by scaling down the number of energy products purchased from that country. As a result, energy exports from Russia, worth 148 billion euros in 2011, decreased to 99 billion euros in 202.

Despite these measures, before the war, the dependence of some EU countries on Russian gas and oil remained very high. According to data from 2020, the countries with the highest dependence on Russian energy products were Slovakia (78.4 percent), Lithuania (68.8 percent), Poland (67.5 percent), and Finland (66.8 percent). The reduction of Russia's energy imports caused an energy crisis in many EU member states, including the above countries. Furthermore, the lack of time to find alternative energy sources worsened the situation.

The Need to Diversify Energy Sources

Between May and October 2022, gas imports from Russian sources to the EU were cut by more than 80 percent, which produced an unplanned price increase in the EU energy market. Moreover, filling the entire gap in energy imports from Russia with renewable energy sources is a long-term task. For this reason, the EU began to implement urgent measures to fill the deficit in fossil fuel imports by increasing imports from other partners.

The EU's most important steps were as follows:

- Strengthening the energy partnership with Azerbaijan, both prior to and subsequent to the signing of the July 2022 Memorandum of Understanding deepening the strategic energy partnership. The events flowing from this document reaffirmed that Azerbaijan is one of the EU's most reliable energy partners, leading the country to increased natural gas exports to the EU;
- Strengthening cooperation with the U.S., Canada, Australia, Egypt, Israel, and the Gulf countries to accelerate liquefied natural gas (LNG) imports. As a result, LNG accounted for one-third of total net gas imports in 2022. Also, measures for the development of infrastructure and the construction of new terminals are currently underway to further increase LNG imports. The largest LNG exporters to the EU in 2022 were the U.S., Australia, and Qatar;

- Increasing the amount of gas imported through the pipeline from Norway, the United Kingdom, and North African countries; and
- Negotiations were held with Nigeria, Angola, the Sub-Saharan countries, and other partners for new potential import sources.

All of these measures led to the gas storage of the EU increasing from 30 percent in February 2022 to 90 percent in October 2022. As a result, energy prices began gradually to decrease.

The EU aims to reduce energy consumption in all member states by 2030 by 10 percent through the implementation of various measures.

The Current Status of Renewable Energy Production

Although the EU is successfully mitigating the effects of the energy crisis with the above-mentioned measures, the transition to renewable energy sources remains an important goal.

The EU has more than doubled its share of renewable sources in its total energy production over the past two decades, reaching 22 percent in 2021. The REPowerEU plan aims to increase the amount of renewable energy to 45 percent by 2030. Before the energy crisis, the EU's 2030 target was much lower.

One of the main problems is the difference in renewable energy production among EU member states. Thus, the countries with the highest share of renewable energy in national total energy production are Sweden (62.6 percent) and Finland (43.1 percent). In contrast, this ratio is only around 12 percent in Luxembourg, the Netherlands, and Malta. The aim is to find ways to effectuate the transition to renewable energy across the European Union.

The Sustainability of Renewable Energy Sources

The main renewable energy sources of the European Union are hydro, solar, and wind energy, which are of great importance in electricity production. For many years, hydropower was the largest renewable energy source in the EU, but this trend has started to change in recent years. As a result of severe droughts in Europe in 2022, the share of hydropower production in the EU's total electricity production fell by about 2 percent to 10.1 percent—the second-lowest figure since 2000 (notwithstanding substantial new investments in hydro power sources). On the contrary, the share of solar and wind energy in the EU's total electricity production, which was only 0.8 percent in 2000, reached 22.3 percent in 2022. Also, for the first time in history, solar and wind had a larger figure than nuclear and gas. This amount continues to increase annually with the construction of new power plants fed by wind and solar sources.

On the other hand, hydropower generation is vulnerable to droughts, and solar and wind power production is weather-vulnerable, so the combined management of these three sources is the key to the future of sustainable and long-term energy. Thus, water stored in hydropower plant reservoirs for energy production can be used to quickly and effectively respond to deficits in solar and wind power production. For this reason, development in each field is crucial from the standpoint of the reliability of renewables. Increasing the number of solar and wind power plants and using newer technologies is a priority. In addition, it is important to implement the following measures in hydropower plants (HPPs) to build a complex sustainable energy system:

- Using more sustainable, multifunctional, and environmentally-friendly technologies;
- Optimizing infrastructure and equipment in existing HPPs through innovative solutions to reduce environmental impacts;
- Implementing climate change adaptation measures in new and existing HPPs; and
- Increasing the height of existing dams or constructing new dams to increase the water storage potential of reservoirs.

The Importance of the December 2022 Bucharest MoU on Green Energy

In parallel with the increase in clean energy production in the European Union, several agreements were reached to increase imports from other countries. One such document was signed in the form of a Memorandum of Understanding by Azerbaijan, Georgia, Romania, and Hungary in December 2022 in Bucharest for a strategic green energy partnership. According to the text, Azerbaijan will export green energy to Romania and other European countries via an underwater cable spanning the Black Sea.

Azerbaijan's large wind and solar energy potential creates opportunities for the further growth of green energy exports to the European Union in the future.

We can conclude this IDD Analytical Policy Brief by citing remarks regarding Azerbaijan's renewables potential made by President Ilham Aliyev on 3 May 2023 at a conference organized by ADA University in Shusha:

> An original target for Black Sea cable was one gigawatt. But when Azerbaijan joined the project, we increased it to four gigawatts because we already signed contracts and MoUs with international companies to produce 25 gigawatts of solar and wind energy in Azerbaijan. So, MoU with these companies, leading companies, actually means a contract. So, 25 gigawatts will be available here in the Caspian and onshore, and we need to have the capacity; we need transmission. So, if everybody listened to what we advocated for today, European energy security would have been much better protected. [...] [W]e looked at this project from a bigger perspective, not just a Black Sea cable, but [as] a transportation route from Caspian offshore wind farms to Europe, and to have an integrated project. Unlike the Southern Gas Corridor, which was a fragmented one consisting of three independent integrated pipelines, now we want to have integrated projects

from the source, and of course, the source will also be in Georgia to the final destinations. And after we started this formal cooperation, we already started to receive some messages from some other European countries which wanted to join. So, I think that it could be a really global project. [...] And as I already said, with several major international companies famous for renewables, we signed contracts and MOUs to produce 25 gigawatts. Almost 500 megawatts already are being constructed, 230 megawatts inauguration we are planning within several months. So, more than 700 megawatts of solar and wind we will have maximum by 2025, and the rest is in the pipeline. So, we have a great future and must always be together. [...] [P]roven reserves of wind and solar power in Azerbaijan are close to 200 gigawatts: the IFC has already confirmed this with respect to the Caspian Sea. 157 gigawatts of wind power only in the Caspian Sea, which belongs to us.