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Russia's Invasion of Ukraine: Consequences for Global Decarbonization

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DOI: 10.3929/ethz-b-000550755

Abstract

Russia is the world's largest energy exporter by a wide margin. The Russian invasion of Ukraine and the Western sanctions against Russia will therefore affect many parts of the global energy system. Worldwide investments in renewable energy will be incentivized by the higher fossil fuel prices. Petrostates will likely benefit from higher oil and gas prices for a few years, only to eventually experience a steeper decline than previously foreseen. Germany and other European countries may find that they are no longer suitable locations for energy-intensive industries. China might find itself in an advantageous position, importing fossil fuels cheaply from Russia even as international demand for clean energy equipment made in China skyrockets. The outlook for blue hydrogen has worsened, while that for green hydrogen has improved.

Introduction

Decarbonization includes both the phasing-in of clean energy sources and the phasing-out of fossil fuels. In this article, I consider the consequences of the Russian invasion of Ukraine for both and find that it will unleash multiple countervailing forces, introducing new complexity to the future of the global energy system and its decarbonization.

Renewable Energy

Russia's invasion of Ukraine is causing price gyrations not only in oil markets—which have been unstable since the 1860s—but also in the usually more staid gas and coal markets. The price instability increases the complexity and risk of fossil fuel investments while strengthening the case for renewables in terms of both price and security of supply. In the long term, these will be the most salient effects of the invasion on the global energy sector. As the world's largest exporter of fossil fuels, Russia has clearly done itself a major disservice.

For China, Russia's war against Ukraine may have many negative consequences: the weakening of its main ally, increased unity and resolve on the part of the West to stand up to authoritarian states, reduced domestic and international confidence in the effectiveness of authoritarianism, and accelerated decoupling of the West from China. In the energy sector, however, China may find itself in a win-win situation where it can buy fossil fuels cheaply from Russia (Meister 2022) while simultaneously selling solar panels, wind turbines, and other clean-energy goods and technologies to the rest of the world. Already, 69.8% of the global supply of solar panels comes from China, while only 3.2% and 1.8% come from the United States and Europe, respectively (Statista 2022).

As the world attempts to accelerate decarbonization, bottlenecks in the supply of critical materials for clean-energy technologies will become more acute. Russia

and China are key suppliers of such critical materials. Kazakhstan is also a major supplier; it has large reserves of 16 critical materials and moderate reserves of another two (Vakulchuk and Overland 2021). Kazakhstan has only cautiously distanced itself from the Russian invasion, and China has quietly developed a dominant position in the Kazakh mining sector as Western interest in Central Asia has faded. The extent to which Kazakh critical materials will be directly available to the West is therefore an open question. Dependence on critical materials from China, Kazakhstan, and Russia may slow down the energy transition in the West.

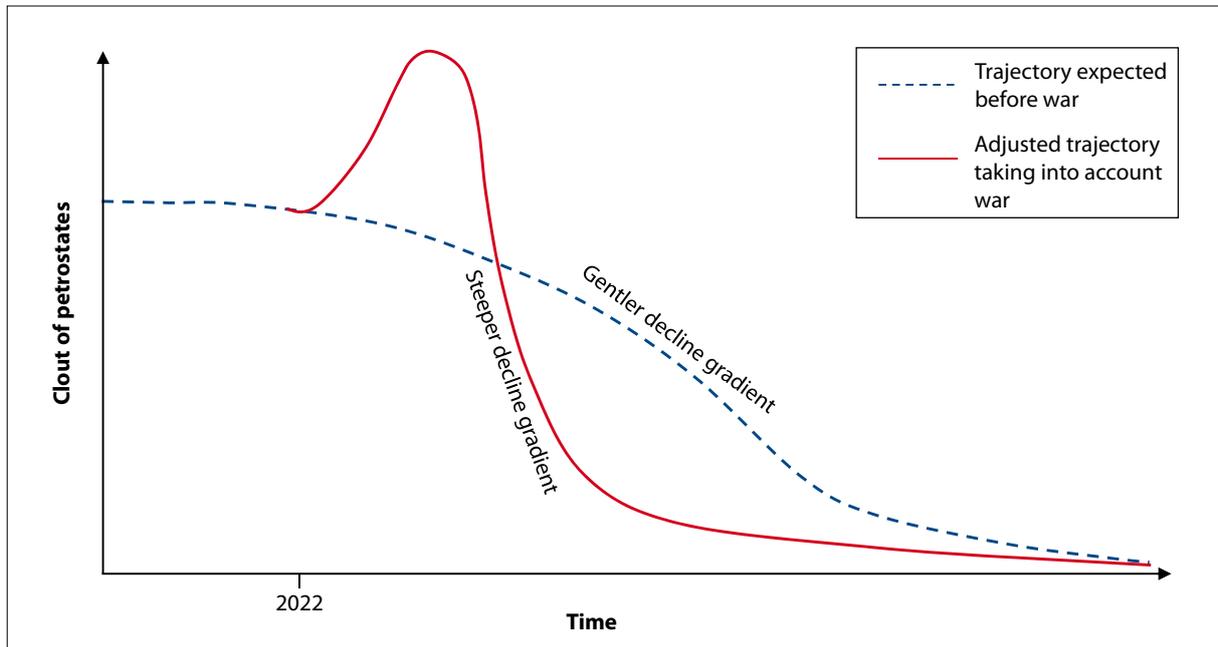
Fossil Fuels

While Russia's invasion should provide a powerful impetus for expanding renewable energy generation, ramping up renewables will take time. In the short to medium term, fossil fuel prices will be high and fossil fuel companies and exporters will be awash in revenue. The revenue may tempt them to invest more in future fossil fuel extraction, but that would be risky, given the long lead times for most fossil fuel projects and the supercharged longer-term outlook for renewables due to the same high fossil fuel prices.

The improved short-term fortunes of fossil fuel-producing countries could leave them vulnerable to an even steeper decline than previously foreseen, because later they will be falling from a higher point and against a background of more aggressive investment in clean-energy alternatives. The difference in the decline gradient could be substantial and the effect on petrostates could be brutal (see Figure 1 overleaf for an illustration).

Many petrostates have long struggled to handle oscillations in the oil price, which is a driver of "Dutch disease," considered to be one of the main elements of the resource curse. The price cycle triggered by the Russian invasion of Ukraine could lead to some major resource-curse episodes.

Figure 1: Possible Steeper Decline of Petrostates after Initial Boost from Russian Invasion of Ukraine



The many countries that have been in the process of ramping up LNG imports—in some cases to reduce reliance on coal—will encounter higher prices as the EU makes a frantic dash for non-Russian gas. Many of those countries are middle- or low-income and will struggle to pay the rising price of LNG. Some of them may deal with this challenge by sticking with or returning to coal, especially if they have domestic reserves.

One of the main ways for the EU to reduce its dependence on Russian gas is through heat pumps. The technology is simple, does not require vast acreage, can be scaled up and down, and does not necessarily require lengthy planning procedures or permitting. Heat pumps are important because heat for buildings makes up a large part of gas consumption and heat pumps can run on (relatively small amounts of) electricity from renewable sources. Anyone in the heat pump business is poised to do well in the coming years.

Nuclear Power

The Russian invasion has probably also improved the outlook for the international nuclear power industry. Pressure is mounting to pause or reverse German nuclear plant closures, and as more countries start making a more concerted effort to decarbonize, they may start thinking about including nuclear power in their energy mix. As with higher oil and gas prices benefiting Russian oil and gas companies, this looks like an area where Russia could stand to benefit from the international energy turmoil in the wake of its invasion of Ukraine. Russia is “only” the world’s 6th-largest producer and 12th-largest exporter of uranium, but

Russian nuclear energy champion Rosatom has achieved a dominant role in the world nuclear power market by bundling nuclear fuel with technology, design, capital, and waste management. Its global nuclear empire spans 73 ongoing or planned reactor construction projects across 29 countries, with the value of the largest projects running into the tens of billions of dollars. The largest (planned) project is in South Africa and has an impressive price tag of US\$76 billion.

However, the prospects for Russian nuclear exports may not be so rosy after all. It is one thing to continue buying fossil fuels from Russia in the short term to navigate the immediate energy-market impacts of the invasion. However, it is difficult to imagine that any Western or Western-leaning country would want or dare to enter into cooperation with Russia in the nuclear sector in the foreseeable future. Finland, for instance, cancelled its Russian project at Hanhikivi in May 2022.

It is possible that American, French, or Japanese companies could fill the gap left by the Russians in the international nuclear power market, but the Chinese might be able to make better offers. Again, however, it is a moot question whether any Western-oriented country would like to enter into deep cooperation with the Chinese in the nuclear sector. Thus, another scenario is that the bifurcation of the world will extend to the nuclear sector, with one international market for nuclear power dominated by China and Russia and the other by Western countries.

Energy-Intensive Industries

Germany and other European countries have been able to maintain energy-intensive industries based on a steady

flow of Russian gas. These industries have been subject to growing pressure since 2018 as the price of greenhouse gas emissions allowances in the EU Emissions Trading System (ETS) has risen. Over time, it will make sense for energy industries to relocate to locations with abundant clean energy—in the form of large hydropower, wind, or geothermal resources—and, importantly, the space to harvest these resources (Overland et al. 2019). This geographical shift is widely predicted in the literature on the geopolitics of the energy transition (Vakulchuk et al. 2020). Reduced access to Russian gas should accelerate the shift. Much of Europe is no longer suitable for siting energy-intensive industries.

The main hope for avoiding industrial relocation is switching from fossil fuels to hydrogen (Van de Graaf et al. 2020). However, the decoupling of Russian gas from European industry is bad news for “blue hydrogen” enthusiasts. Their ambition is to split natural gas into hydrogen and CO₂, capture the CO₂, and store it underground or use it as an industrial feedstock. Russia could play a key role in this market: It has the world’s largest gas reserves, depleted oil and gas fields that could be used to store CO₂, and a vast network of pipelines that could possibly be repurposed to transport hydrogen to the EU. With Russia missing in action, the prospect of a blue hydrogen boom may come to depend on natural gas from more remote suppliers such as Australia, Qatar, and the United States, in which case it will be necessary to liquefy the hydrogen for transportation by ship. This will substantially reduce the energy return on energy invested (EROI), as hydrogen has to be cooled to -253°C to achieve liquefaction, rather than -163°C like natural gas. Liquefied hydrogen also suffers from a higher rate of boiloff. The resulting lower efficiency/higher price will further weaken blue hydrogen in the

race against green hydrogen made with renewable energy and electrolysis. Green hydrogen can be produced locally in the EU or in North Africa and transported by pipeline. However, green hydrogen is unlikely to represent a cure-all for the relocation of energy-intensive industries from the EU.

International Climate Policy

Russia has never been a driving force of international climate policy. However, it is the world’s fourth-largest emitter of greenhouse gases, and its involvement therefore matters. On the one hand, given the schism between Russia and virtually all pro-climate countries in the world, it is now difficult to imagine cooperation with Russia on international climate policy. On the other hand, if Russia seeks to break out of isolation at some point in the future, climate policy could be one of the very few areas where Ukraine’s supporters *might* be willing to have any contact with Russia at all.

What about decarbonization in Ukraine? Although its emissions are far smaller than those of Russia, Ukraine is the world’s 26th-largest emitter and thus not insignificant. It had already started moving toward green energy before Russia expanded its attack on Ukraine in 2022. Ukraine will now expectedly double down to minimize its reliance on Russian fossil fuels and also work hard to join the EU—where clean energy is a major focus (Stavchuk and Savytskyi 2022). Previously, Ukraine was held back by powerful oligarchs in the energy sector, pervasive corruption, and a weak state—all actively fomented by Russia. Decoupled from Russia and with a newfound sense of national unity and trust among societal groups and the state, Ukraine should have a good chance of accelerating its transition away from Russian fossil fuels and dominance.

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Indra Overland is Research Professor and Head of the Research Group on Climate and Energy at the Norwegian Institute of International Affairs (NUPI). His recent publications include *Russian Oil Companies in an Evolving World: The Challenge of Change* (Edward Elgar, 2020), “Is this Russia’s Kodak moment?” (*Oxford Energy Forum*, 2021), and “Villain or victim? Framing strategies and legitimation practices in the Russian perspective on the European Union’s Third Energy Package” (ERSS, 2021).

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ANALYSIS

Step Up or Perish: The EU’s Struggle with Russian Energy Imports and Its Role in the New Geopolitical Reality

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DOI: 10.3929/ethz-b-000550755

Abstract

In the tension between Russia and the West, currently being stoked by Russia’s war on Ukraine, two things have become clear. First, the more united the West is in its reaction to the Russian aggression, the greater the impact. Second, dependence on Russian energy is the West’s Achilles heel. The Nord Stream 2 pipeline, a specter of disunity that has long haunted the European Union, has turned into a significant weakness in the foreign policy sphere. The dependence has exposed vulnerability vis-à-vis Russian geopolitical ambitions and hinders efforts to build political consensus. Since not all EU members are equally dependent on energy imports from Russia, they are not on the same page as to what actions should be taken against the Russian aggression. Nevertheless, there are things that can and should be done if the EU wants to be a relevant international player. The key is not to repeat past mistakes.

Energy and the EU’s Foreign Policy

While almost-unanimous Western military support is providing a much-needed lifeline for Ukraine, the influx of payments for Russian energy exports is keeping the Russian economy afloat. Even though it is clear that the EU’s inability to impose a joint embargo on Russian energy imports is harming the effort to stop the Russian aggression, an agreement remains out of reach, as not all members are on the same page. Although this disunity applies to the EU’s external affairs in general, the lack of a common voice in the energy sphere is especially harmful. The lack of unity is all the more apparent since the energy sector stands at the center of EU policymaking for years to come. Not only does this import-dependence constitute a security weakness, but it also highlights the importance of the EU’s goal of decarbonization by 2050.

Although the European Commission’s President and the European Council’s President became active in the wake of the Russian invasion, expressing the Union’s support for Ukraine, they could not go far beyond rhe-

toric or ideas such as the recovery fund without the members’ consent. Furthermore, when taking a closer look, one can tell that EU unity is not seamless. Leaving aside the obvious case of Hungary—which is distancing itself from the war as its prime minister, Viktor Orbán, becomes ever more self-involved—the lack of a comprehensive agreement in the external sphere was apparent even before the hot phase of the current conflict. As a presidential candidate, current French president Emmanuel Macron toured Ukraine and Russia on his own, trying to become a mediator and apparently score political points in advance of the French presidential elections. In retrospect, not only was his mission unsuccessful, but he clearly did not speak for the EU as its ambassador. The fact that Russia has so ostentatiously overlooked the European Union as a potential discussion partner is telling.

Developments in recent months have highlighted the rise of geopolitical tensions that have been palpable since the mid-2000s. With Russia’s growing ambitions, China’s strengthening global position, and changes in

the focus of U.S. foreign policy, the global geopolitical environment has been undergoing seminal shifts since the late 2000s. Although the EU's ambitions have also been growing, they have focused mostly inwards, trying to perfect the crown jewel of post-war European integration: the common market. There is certainly nothing wrong with that. The internal energy market is a significant integration step toward tighter cooperation and internal cohesion of the Union. However, the geopolitical reality got ahead of the EU's capabilities on the global scene, and nowhere is this currently more evident than in the energy sphere. Energy security and energy supply are determining factors for the members' economies and are thus crucial for the whole integration project. At the same time, it became apparent that in the intensified geopolitical struggle, the EU's current tools in the foreign policy sphere are simply insufficient.

What the Kremlin likely expected to be a swift operation to topple the Ukrainian government has turned into a violent, painfully protracted war where significant advances are rare and expensive. Since Ukraine is being supplied with advanced Western military technologies, the cost of Russian war efforts is mounting. Oil and gas exports have always been a major source of income for the Russian budget, and following several rounds of sanctions, they have become Russia's key remaining source of income. Embargoing Russian energy exports thus seems like a surefire way to dissuade Russia from continuing its aggression against Ukraine. Yet it is in precisely this area that EU members have been unable to agree on a joint approach. After the initial shock and occasional doubts over the future of the EU Green Deal in the wake of the Russian attack, the view that the goal of decarbonization would, in fact, help solve the current crisis prevailed. However, this unity seemed to evaporate when it came to concrete steps. The disunity became most apparent in the case of oil sanctions. Commission President Ursula von der Leyen introduced an ambitious plan to phase out Russian oil supplies by the end of this year. This is undoubtedly a potent tool against Russia's key source of income, but requires unity to make an impact. Before agreeing to the measure, Hungary, Slovakia, the Czech Republic, and Bulgaria signaled that they would need a transitional period to ready their supply portfolios before the measure was deployed, effectively delaying the impact in a situation where every week counts.

Cracks in Unity

When the Commission came up with its proposal to phase out Russian oil imports by year's end, it seemed

like an ambitious yet logical step. Aiming at the biggest source of income for the Russian budget is an obvious way to seek to stop the aggression against Ukraine. However, at least four members voiced their concerns and called for postponing the measure.

The Czech Republic, quite surprisingly for some, was among them. The Czech position was unanticipated for two reasons. First, it has been one of the most visible supporters of Ukraine since the conflict began. The country has not only supported Ukraine politically, with its prime minister being among the first foreign leaders to visit besieged Kyiv in mid-March, but it has also supplied Ukraine with a significant amount of military equipment. Second, the country has boasted since the mid-1990s of being among the first post-communist countries to achieve a diversified oil and gas supply portfolio. However, it would be wrong to assume that the Czech Republic is retreating from its strongly supportive position. It all comes down to the numbers and amounts of imported oil and pipeline capacity. In 1996, the country built an alternative supply oil route to reduce its dependence on Russian crude flowing via the Druzhba (Friendship) pipeline. The newly built IKL pipeline connected the country to the TAL pipeline (Trans-Alpine Pipeline) in southern Bavaria, Germany. However, although the IKL pipeline has sufficient capacity to meet Czech consumption, the TAL pipeline constitutes a bottleneck. The pipeline bringing oil from the Italian port of Trieste needs to be expanded to supply more oil to the IKL pipeline. Projects to increase TAL's capacity were underway for several years, but they fell victim to peacetime complacency and a lack of strategic thinking. Expanding TAL's capacity was on the table in 2013 but was sidelined as unnecessary by the new government in 2014, despite the annexation of Crimea and the ensuing events. The good news is that since the project merely aims to expand an existing pipeline, the Czech Republic should be ready to wean itself off Russian oil by June 2024, according to the country's government.

Bulgaria, Hungary, and Slovakia are located on an offtake of the same trunk pipeline (Druzhba) as the Czech Republic, but their reasons for requiring a transitional period are different. As oil crudes differ in sulfur content and density, refineries are typically set up to process a specific crude. The Hungarian Duna refinery, the Slovak Slovnaft refinery, and the Bulgarian Burgas refinery are all set up to process Russian Export Blend crude oil (REB or REBCO). Their repurposing will take time and significant investment.¹ In extremis, any country can import the desired crude or finished oil products

¹ Although one of the two Czech refineries, the bigger one in Litvinov, is also set up to process Russian crudes, the other (in Kralupy) can process lighter and sweeter (low in sulfur) crudes.

if necessary, but such a decision depends on price and demand. Thus, the issue with refineries and their repurposing to process non-Russian crudes is mainly related to their financial sustainability.

While the impact of cutting oil supplies from a particular supplier is generally alleviated by the global nature of the oil market and the storability of the commodity, natural gas poses a different set of challenges. Dependence on physical pipeline infrastructure and a higher share of long-term contracts, especially in central and eastern Europe (CEE), make any supply cuts more impactful. Another factor that renders the gas sector more sensitive is the use of the commodity. Natural gas is frequently used for heating, making any supply curtailment an emergency issue, especially during the heating season. Moreover, switching to alternative fuels is a relatively lengthy process. For several CEE states, the push to decrease the share of natural gas in their energy mixes has come at an unfortunate time, as these countries intended to switch from coal to natural gas in district heating. Although also a fossil fuel, natural gas produces lower amounts of pollution and was thus viewed as a transitional fuel on the way to the EU's goal of climate neutrality. Such a role is now somewhat uncertain, as the environmental reasons for higher utilization of natural gas now go hand in hand with geopolitical concerns.

The lack of unity on gas-related issues has been apparent for some time. Undeniably, Nord Stream 2 has been the reason for most arguments in recent years. One example is the row over market rules implementation between Germany and France (backed by the eastern EU members). Another example is the disunity of the Visegrad Group over the Nord Stream 2 pipeline. While the Czech Republic and Slovakia tacitly supported the pipeline, Poland was strenuously opposed to it. Hungary, for its part, was an outlier due to its special relationship with Russia, which enabled it to make individualized deals in the natural gas and nuclear sectors. It is therefore unsurprising that Hungary, quite apart from being the dissenting voice in the discussion on the Russian oil embargo, has also now shown a willingness to accept the Gazprom-proposed payment scheme for gas supplies. In fact, the Russian push to implement sanction-avoiding payment schemes and the willingness of several European buyers to comply shows that EU unity disappears when pressure is applied on strategic commodities.

The Way Forward

Despite the obstacles to an EU-wide oil and gas embargo, tighter cooperation in the energy sphere is not only the way to impede the ongoing Russian aggression, but could also potentially turn the EU into a stronger international actor. The past few months have provided additional evi-

dence that without a joint approach to external affairs, the EU is not only unable to take on the Russian aggression, but also unlikely to become a relevant international actor in times of heightened geopolitical tensions.

When seeking a way forward, it is key to know what can—and, even more importantly, cannot—be done. The common energy policy cannot be concerned with individual states' energy policies. These are too diverse and case-specific, and any one-size-fits-all approach would not work. Thus, the EU can formulate common goals—like the goal of having a carbon-neutral economy by 2050—that provide a framework and a driving principle, but states should choose specific measures based on their capabilities. Nevertheless, the common energy policy still has the potential to be applied in several areas. The EU should take the following two steps.

1. Formulate the EU's approach to external partners and actors, mainly by enforcing the rules of the common market. The main goal going forward should be to enforce the application of the update to the 3rd energy package, i.e., apply the rules on pipelines to and from third-party countries. In this case, the EU has a blueprint of what not to do. Back in early 2019, after a brief row over the implementation of the package update, Germany was given the green light to carry on with the Nord Stream 2 project as long as it ensured its compliance with the market rules. Although it was unclear how this would be done, Germany was given a blank check. Such a solution not only lacked transparency vis-à-vis the market rules, but also rightfully angered the project's opponents (mainly Poland and the Baltic states), as they were excluded from the decision-making process. Leaving aside the Nord Stream 2 project's problematic nature, this outcome undermined unity within the EU and laid bare gross differences in understandings of the concept of energy security between the Western and Eastern parts of the Union. The West, focused on market functioning, simply did not see eye to eye with the East, which was concerned about geopolitical implications. Recent developments prove that geopolitics is a factor to be taken seriously.
2. Provide a framework for transborder cooperation, mainly infrastructure-building, and thus help share costs and mitigate risks. Such an attitude is essential now, with the need for a flexible pipeline system to mitigate potential supply cut impacts, but it will be even more needed in the future as the energy transition progresses. Here, the EU already has the tools, but reforms are needed. The chief tool is the Projects of Common Interest (PCI) list, updated every two years since 2013. The PCI initiative covers projects that the European Commission has designated as

key for developing energy infrastructure. Projects on the PCI list benefit from a streamlined permitting process and institutional backing, which should help them acquire financing. However, experience suggests that the list often includes projects with dubious sustainability or projects with contradicting goals. On top of this, the initiative does not fully cover project costs and thus in no way guarantees their completion. The fluctuation of projects listed under this initiative over the years suggests that many of them were, in fact, untenable.

The EU should reform its Projects of Common Interest initiative and implement more rigorous scrutiny of projects applying for PCI status. This will provide a clear-cut view of the desired future for EU infrastructure and give potential investors a concrete idea of which projects have institutional backing and thus represent a solid investment opportunity.

In terms of financing, the EU can gain inspiration from the Three Seas Initiative, which opted for the investment fund model, relying on private capital to finance the entailed projects instead of government-provided funds. This model has the clear advantage of using state-backed funds to offer greater reliability to potential private investors. Such a financing model is suitable for smaller-scale projects with a clear implementation timeline.

Apparently, the EU is not yet ready to apply the principle of a qualified majority on energy-related measures—and frankly, given the diversity mentioned above, it would not make sense. However, the July 2021 ruling of the European Court of Justice provides the basic institutional scaffolding for making policy decisions with a broader impact on EU members or the EU as a whole. In its ruling, the Court invokes Article 194 of the Treaty on the Functioning of the EU and posits that the solidarity principle can also be applied to energy security and related issues. That effectively means that policy decisions or decisions on projects impacting more than one member state or the internal energy market

as a whole should consider the interests of all involved parties. Put simply, the ruling set a precedent that large infrastructural projects, such as Nord Stream 2, should be implemented based on a broad consensus of involved parties—that is, member states. Theoretically, if the precedent is upheld, the frustration of Nord Stream 2 will not reoccur.

Homework for the EU

In light of the Russian invasion, subsequent threats, and supply cuts, it has become clear that the EU needs a joint attitude to external energy supplies. To help secure supplies, the EU's adherence to transparent rules and the weight of the Union as the biggest market for Russian gas will play a substantial role in keeping the misuse of energy supplies at bay. Whether EU members decide to make joint gas purchases or not is now of secondary importance; nevertheless, a joint effort in a geopolitically charged environment will be a necessity from now on.

The geopolitical shifts we have seen in recent years have shown that the idea of spheres of influence is not dead. If the European Union wants to be a relevant actor in such a setting, it should prioritize internal unity. An internally coherent Union could play a significant role on the international scene, given its population size and economic output. Although achieving internal unity could be a lengthy process, there are measures that the EU can implement in the short term to strengthen its position. The good news is that the Union has the tools at hand.

In a geopolitically competitive world, the EU cannot remain idle if it does not want to become irrelevant. The energy sector is crucial for its determining role in the economy. In fact, it is arguably the most important area of the Union's external relations, since it is closely related to the member states' economies and citizens' lives. The EU's ambitious goal of reaching carbon neutrality by 2050 cannot be reached in any way other than by building a coherent union with a confident external policy.

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Europe's Energy Dilemma and Azerbaijan's Potential Contribution

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DOI: 10.3929/ethz-b-000550755

Abstract

The main aim of this article is to explore the potential role of Azeri natural gas in meeting European Union energy security needs. Specifically, it seeks to ascertain the consequences for Azerbaijan's energy exports should Russia turn off the taps or the EU stop importing Russian fossil fuels. Could Azerbaijan help boost European energy security?

Introduction

The war in Ukraine has once again reminded the European Union of its heavy energy dependence on Russia. Despite the fact that the EU received significant signals from the 2006 and 2009 energy crises between Ukraine and Russia and the 2014 annexation of Crimea, it has not yet eliminated its energy dependence on Russia. On the contrary, Germany even facilitated the construction of the Nord Stream 2 pipeline bringing gas from Russia to the EU. (Germany did, however, halt the certification of the project following Russia's invasion of Ukraine in February 2022.)

Following the invasion of Ukraine, the EU adopted new sanctions packages against Russia. The bloc, however, excluded oil and natural gas because nearly 45% of its gas imports, 45% of its coal, and 25% of its crude oil come from Russia (European Commission 2022). The EU is aware that without Russian fossil fuels, its economy would be disrupted.

To counter the EU sanctions, Putin signed a decree requiring European countries to pay in rubles for Russian gas from April 1. The decree provided that contracts would be suspended if these payments were not made. On April 27, Moscow applied its energy power directly by cutting off gas to Poland and Bulgaria, which had refused to pay in rubles. This suggests that Russia may use the natural gas weapon against other member countries. Putin believes Russia has that capability: in his view, "a replacement for Russian gas simply does not exist" (Bloomberg 2022).

The war has also encouraged the European Commission to intensify its efforts to find alternative energy sources, as tensions between the West and Russia have increased markedly and these tensions are slowly beginning to impact the energy sector. German Energy Minister Robert Habeck visited Qatar and the UAE in March, while EU Commissioner for Energy Kadri Simson and EU Commissioner for Neighbourhood and Enlargement Olivér Várhelyi visited Baku to attend the 8th Ministerial Meeting of the Southern Gas Corridor

Advisory Council. The main aim of the visit was to ask for extra natural gas supplies from Azerbaijan. According to Energy Commissioner Simson, "we want the volume of gas exported from Azerbaijan to Europe to reach 10 billion cubic meters" (Wesolowsky 2022).

The principal purpose of this article is to explore the potential role of Azeri natural gas in meeting European Union energy security needs. More specifically, it intends to ascertain what the consequences are for Azerbaijan's energy exports should Russia turn off the taps or the EU stop importing Russian fossil fuels. What could this mean for Azerbaijan's energy exports? Could Azerbaijan help boost European energy security?

The EU's Energy Outlook

On March 8, the EC introduced an ambitious plan to decrease Russian natural gas imports by two-thirds before the end of the year and to make Europe independent from Russian fossil fuels by 2030 (European Commission 2022). The EU imported 43.5% of its natural gas from Russia in 2021; significant volumes also came from Norway (23.6%), Algeria (12.6%), the US (6.6%), and Azerbaijan (2%). Overall, the EU's natural gas import dependency rate was 83%, while natural gas production in the EU continued to decline (Eurostat 2022). Most of these imports came through pipelines, but a growing share now comes in liquid form, notably from the US, whose LNG exports to the EU have increased significantly since 2016. In addition to natural gas, 27% of the EU's oil imports and 46% of its coal imports came from Russia (European Commission 2022).

The Role of Azeri Natural Resources: Expectations versus Reality

Azerbaijan is a reliable non-Russian energy provider that has helped Europe diversify its gas supply routes and enhance its gas security via the Southern Gas Corridor (SGC). Some experts compare Azerbaijan's energy contribution to Russia's by analyzing overall EU consumption. As mentioned above, Russia was the most signif-

icant single energy supplier to the EU in 2021 (43%). For its part, Azerbaijan is not necessarily a silver bullet for the EU as a whole. However, it can be argued that Azerbaijan has the potential to make a remarkable energy contribution to specific member states.

The Trans-Adriatic Pipeline (TAP) is the third leg of the SGC, which has been in operation since December 2020. The 878-km-long pipeline transports natural gas from the Shah Deniz field in the Azerbaijani sector of the Caspian Sea to Europe. It connects with the Trans-Anatolian Pipeline (TANAP) at the Turkish–Greek border in Kipoi; crosses Greece, Albania, and the Adriatic Sea; and then comes ashore in Southern Italy.

Currently, TAP's operational capacity is 10 billion cubic metres per annum (bcm/a), of which 8 bcm will be exported to Italy and 1 bcm each to Greece and Bulgaria. According to the EC Quarterly Report (2022), the TAP provided 2.7% of total extra-EU gas imports in the third quarter of 2021.

The TAP is highly significant for energy security in Italy, Greece, and Bulgaria, as these countries rely primarily on Russian gas, making them vulnerable to gas supply cuts and high gas prices imposed by a monopolistic supplier. Azerbaijani gas currently enters Bulgaria at the Kula–Sidirokastro border checkpoint with Greece through an existing line with a capacity of 3.68 bcm of gas per year. This significantly restricts imports of Azerbaijani gas into Bulgaria, as it allows for supplies of only 250–300 million cubic meters per year. Following the launch of the Interconnector Greece Bulgaria (IGB), however, Bulgaria will be able to meet up to 33% of its total gas demand through TAP. It is expected that the interconnector will first guarantee Bulgaria 1 billion cubic meters of gas per year, with a later increase to the design capacity of 3 bcm per year.

According to Borrell, “we are prepared in case diplomacy fails and we are looking at all options. This includes improving our resilience, including by working with partners like the US, Qatar and Azerbaijan, on the issue of gas supply in case Russia decides to reduce or halt deliveries” (EU External Action 2022). Considering this, one may ask what the possibilities are: Is it possible to expand the current capacity? Can Azerbaijan offer extra gas volume?

As mentioned above, TAP is designed to transport 10 bcm due to Europe's historical natural gas demand. With the EU's demand and source preferences changing, Azerbaijan could increase its market share. TAP's capacity could be increased to a throughput of 20 bcm with the addition of two new compressor stations and modification of the existing compressor stations. On April 29, President Aliyev mentioned that Azerbaijan also needs to find a way to increase its supply. To this end, Azerbaijan aims to reduce gas losses internally and increase its renewable energy production and new gas production.

Umid and Absheron (deepwater) are the potential energy fields that could increase Azerbaijan's longer-term gas production. The Umid field currently produces modest volumes, and the State Oil Company of the Azerbaijan Republic (SOCAR) has not yet succeeded in attracting international energy partners for its expansion. Meanwhile, Total estimates that Absheron has 350 bcm of gas and hopes to produce 5 bcm per year. The field is expected to begin production in 2022 and reach 1.5 bcm in the first phase. Further exploration and development of deepwater offshore prospects will support the expansion of gas production. Prospects include further development of discovered resources of non-associated (deep) gas at ACG, Babek (SOCAR-operated), and Shafag Asiman (BP-operated) (Wood Mackenzie, 2020).

However, this requires construction time and long-term energy contracts and strategies. Therefore, these steps cannot be taken in the short term; they will take more than a year to materialize. Deepwater service facility restrictions also mean that it takes some time from discovery to first gas production. Major gas export expansion would further require new gas processing facilities and pipeline extension. According to Saltuk Duzyol, TANAP's CEO, they plan to increase the SGC's capacity to 23.7 bcm in the second phase and then 31 bcm in the third phase, but this will take four to five years due to construction time.

The Azerbaijan–Turkmenistan maritime border could also have a significant impact on the oil and gas industry. The signing of a memorandum of understanding between Azerbaijan and Turkmenistan in January 2021 on joint exploration and development of the Dostluk (Friendship) field (formerly Serdar/Kapaz) is a positive development. Experts believe that the undersea field, which was discovered in 1986, contains natural gas and at least 50 million tons of oil. It also paves the way for developing the Trans-Caspian Gas Pipeline to deliver Turkmen gas to Azerbaijan and Europe.

While there is a certain excitement surrounding the milestone SGC, change will not come overnight. Current geopolitical developments in the South Caucasus suggest that Russia still holds key political tools in its hands—such as the ceasefire it brokered between Armenia and Azerbaijan—which can be triggered if necessary. For example, Armenia attacked the energy pipelines during the 44 days of war in 2020. In this regard, the EU should continue and intensify its peace initiative between Armenia and Azerbaijan and facilitate the agreement between them.

Oil Security and the Role of Azerbaijan

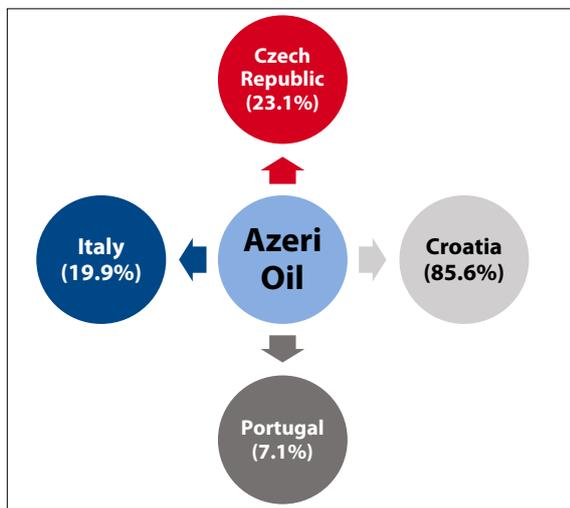
In addition to natural gas, the EU is heavily dependent on imports of crude oil. Similarly to the US and the UK, the EU plans to cut Russia's income by imposing an oil

embargo due to the war. However, this embargo might be a double-edged sword because 27% of the EU's oil imports came from Russia in 2021. This raises the question: Are there enough alternatives?

Azerbaijan is one of the EU's strategic oil partners and currently supplies around 5% of the bloc's oil imports. It transports oil via the Baku–Tbilisi–Ceyhan (BTC) pipeline, which became operational in June 2006. The BTC is a non-Russian pipeline that connects the West to the Caspian Sea. It is especially reliable because it comes from a source outside the Organisation of Petroleum Exporting Countries (OPEC) and is controlled by Western oil firms. It exports up to a million barrels of oil per day, the majority of which is consumed on the European market. It carries oil from the Azeri-Chirag-Deepwater Gunashli (ACG) field in the Caspian Sea and condensates from Shah Deniz across Azerbaijan, Georgia, and Turkey.

According to an IEA report (2021), over 80% of Azerbaijan's crude exports were delivered to destinations in Europe in 2019. During the first quarter of 2020, Azerbaijan exported roughly three million tons of crude oil to Italy, establishing itself as the latter's main crude oil supplier. The Czech Republic, Croatia, and Portugal

Figure 1: European Countries' Dependence on Azeri Oil



Source: Numbers are taken from Eurostat.

gal have also imported crude oil from Azerbaijan. Figure 1 shows these countries' dependence on Azeri oil.

The pipeline also transports crude oil from Turkmenistan and Kazakhstan to EU member states. As such, it can be argued that the BTC has diversified the EU's energy imports and reduced the bloc's reliance on Russia.

However, according to the aforementioned IEA report (2021), Azerbaijan's oil production, which dates to the mid-19th century, has been in decline since 2010. Additionally, Azerbaijan has agreed to several voluntary output cuts in recent years. In December 2016, it joined other non-OPEC producers to co-operate with OPEC in effort to stabilize the oil market. Since then, OPEC and non-OPEC countries have regularly extended their Declaration of Cooperation at biannual OPEC/non-OPEC meetings.

Conclusion

This paper has argued that while Azerbaijan is a reliable, non-Russian energy partner for the EU, its energy resources cannot fully meet the EU's energy demand. Nevertheless, Azeri natural gas resources do play an important role for specific member states (including Italy, Greece, and Bulgaria), while others benefit from its crude oil resources (among them the Czech Republic, Croatia, and Portugal). In the short term, Azerbaijan cannot double its natural gas exports to Europe, as constructing additional infrastructure would take time. Given the current energy crisis, however, the EU will need to formulate a long-term energy (natural gas) plan with Azerbaijan and even with other Caspian Sea countries; this should seek to double the capacity of TAP and explore new sources.

Similar to the BTC oil pipeline, the SGC presents a great opportunity to transport natural gas from Turkmenistan in the future. As such, the EU should also increase its involvement in Central Asia. The EU should not forget about transitioning to renewable energy, but this will take some time and (Azeri) natural gas will play an important role in this process. For Azerbaijan, meanwhile, the current energy crisis presents an opportunity to expand its share of the European natural gas market, attract additional European investors, and improve the country's economic situation.

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ABOUT THE RUSSIAN ANALYTICAL DIGEST

Editors: Stephen Aris, Matthias Neumann, Robert Orttung, Jeronim Perović, Heiko Pleines, Hans-Henning Schröder, Aglaya Snetkov

The Russian Analytical Digest is a bi-weekly internet publication jointly produced by the Research Centre for East European Studies [Forschungsstelle Osteuropa] at the University of Bremen (www.forschungsstelle.uni-bremen.de), the Center for Security Studies (CSS) at the Swiss Federal Institute of Technology Zurich (ETH Zurich), the Center for Eastern European Studies at the University of Zurich (<http://www.cees.uzh.ch>), the Institute for European, Russian and Eurasian Studies at The George Washington University (<https://ieres.elliott.gwu.edu>), and the German Association for East European Studies (DGO). The Digest draws on contributions to the German-language *Russland-Analysen* (www.laender-analysen.de/russland), and the CSS analytical network on Russia and Eurasia (www.css.ethz.ch/en/publications/rad.html). The Russian Analytical Digest covers political, economic, and social developments in Russia and its regions, and looks at Russia's role in international relations.

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Editors: Stephen Aris, Matthias Neumann, Robert Orttung, Jeronim Perović, Heiko Pleines, Hans-Henning Schröder, Aglaya Snetkov

Layout: Cengiz Kibaroglu, Matthias Neumann, Michael Clemens

ISSN 1863-0421 © 2022 by Forschungsstelle Osteuropa an der Universität Bremen, Bremen and Center for Security Studies, Zürich

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