

THE EUROPEAN GREEN DEAL AND EU'S ENERGY TRANSITION IN THE WAKE OF THE WAR IN UKRAINE

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Abstract: *As part of the European Green Deal-aligned net-zero push by 2050, the EU was striving to transition its energy sector to using mostly renewables. Natural gas, however, remained a crucial transition fuel to replace high GHG emitting coal-fired power. But gas prices have been on the rise following the COVID 19 pandemic and have further been exacerbated following Russia's invasion of an EU gas transit country, Ukraine. Since EU's largest economies rely on Russian gas, some countries have already turned retired coal-fired power plants back online, used them in reserve, or delayed their scheduled decommissioning to meet increasing energy demands, which in itself has pushed the EU further away from its previously set climate friendly goals. On the other hand, if Russia were to cut off its gas supply to the EU completely, the EU might be seen massively installing renewables and heat pumps and go through the energy transition faster than it initially planned for. That is why the aim of this paper is to analyze and discuss both scenarios, their short and long-term implications, and the resulting effects on the EU's energy policies. The end result will consist of the pros and cons of each scenario and will trace out both the most beneficial as well as the most likely policy steps of the EU's energy community in response to the energy crisis brought by the War in Ukraine.*

Keywords: *energy crisis, carbon intensity, GHG emissions, coal, fossil fuels*

Introduction

In 2021, European shortage of gas due to the post-COVID recovery led to record-breaking prices. After a dip in January of 2022, gas prices have been on the rise again following Russia's invasion of a European Union (EU) gas transit country, Ukraine. The impact of the war in Ukraine is felt as the third asymmetric shock that the EU has experienced in the last two decades, following the 2008 financial and economic crisis and the COVID-19 pandemic. The current crisis however is different from the previous instances mainly because it could obstruct the EU's path to decarbonization, due to the fact that the transition to a low-carbon economy has not been properly stress-tested against volatility and scarcity. (Popkostova, 2022)

Predating the Russian invasion of Ukraine, the EU adopted the European Green Deal (EGD) whose ambitious goals include achieving climate neutrality by 2050 and a 55% net reduction of emissions by 2030 compared to 1990. With natural gas seen as a crucial "transition fuel", the war in Ukraine has made Europe's energy dependence painfully clear and European net-zero plans, which include swapping coal for natural gas-fired power could be under threat.

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A report by consultancy Aurora Energy Research published in March of 2022 stated that in the extreme case that Russian gas imports cease, this would leave a large gap in EU supply to be met by other sources or demand reductions. This might even reverse progress towards the EU's net-zero goal as European nations may be forced to restart coal and oil power generation, which will potentially lead to increased emissions. (AURORA, 2022) In a sort of a worst-case scenario, if no effective energy crisis management is implemented, this could compromise the EU's pursuit of the EGD and undermine the EU's climate leadership. (Popkostova, 2022) With that said, a major question and at the same time the aim of this paper is to provide an analysis on what will be the immediate and long-term consequences of the War in Ukraine on EU's energy transition and its policies?

Materials & Methods

The European Green Deal

The EGD has been the major talking point of all EU climate-neutrality initiatives ever since its launch in December 2019, but especially following the presentation of the 'Fit for 55' legislative package in the summer of 2021 which aims to translate EGD ambitions into law. This legislation package covers the climate, the environment, energy, transport, industry, agriculture, and sustainable finance – all of which are strongly interlinked and set the EU on the path to a green transition, with an end-goal of reaching climate neutrality by 2050. On the topic of energy, the EGD builds on all legislative pieces that predate it and the 'Fit for 55' legislative package and best describes the EU's road to climate-neutrality, its current energy dilemmas and the policy challenges it faces in the wake of the war in Ukraine.

Considering that 75% of the EU's greenhouse gas (GHG) emissions result from energy production and use, a transition towards clean energy has to be made in order for the EU to achieve climate neutrality by 2050. (EU COUNCILa, 2022) As a result, the EGD and the 'Fit for 55' package have set out the following EU goals and actions for the energy transition: overhaul the entire EU 2030 climate and energy framework to further accelerate the EU's efforts to promote energy efficiency and increase the share of renewable energy sources; ensure the stable supply of energy at affordable prices in the EU; and further develop an integrated and interconnected energy market. (EU COUNCILb, 2022)

The commitment of cutting EU GHG emissions by at least 55% by 2030 compared to 1990, made binding by the European Climate Law, required the EU to revise its energy legislation and targets. According to the EGD, Europe needs to fundamentally transform its energy system into an integrated energy system with high shares of renewable energy and significant energy efficiency improvements. To that end, with the energy efficiency directive, the EU has introduced measures to improve energy savings by making more efficient use of energy supply, which includes an energy efficiency target of 36% for final energy consumption and 39% for primary energy consumption. At the same time, the renewable energy directive aims to increase the share of renewable energy to at least 40% in the EU's energy market by 2030.

EU's Dependence on Russian Gas

Being a signatory to a pledge to accelerate a transition away from coal power at the 2021 United Nations Climate Change Conference (COP26), it is clear that the EU is striving to power Europe using mostly renewables by 2050. Natural gas however is still seen as a crucial “transition fuel”. (Brooks and Adler, 2022) At the moment, the EU imports 90% of its gas consumption (EC, 2022) and Russian energy imports in particular are key for European supply, accounting for 30-40% of total gas imports in Europe and over 75% in some countries in the east and south. (AURORA, 2022)

In the winters of 2006 and 2009, temporary disruptions of gas supplies strongly hit the EU and should have served as a stark “wake up call”. Although a lot was done in order to strengthen the EU’s energy security in terms of gas supplies in the following years, the EU still remains vulnerable to external energy shocks and the ongoing War in Ukraine has raised the threat of supply disruptions. In response, in March of 2022, the European Commission proposed an outline of a plan to make Europe independent from Russian fossil fuels well before 2030, a part of which is the REPowerEU initiative.

Share of Fossil Fuels Imported from Russia to the EU in 2019

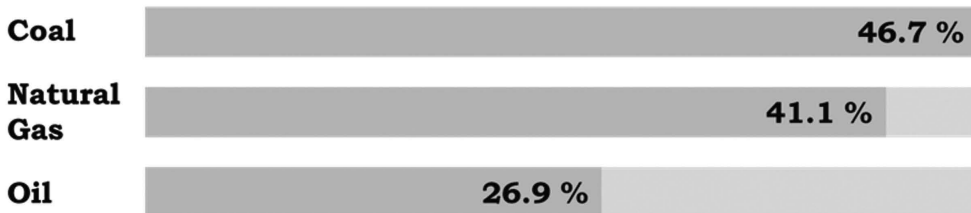


Fig. 1. Russian energy imports to the EU

Likely EU energy policy scenarios

In terms of the likely steps the EU takes following the War in Ukraine and its subsequent energy crisis management we can focus on two scenarios. It should be noted that both scenarios should be looked at as continuous to each other, rather than taking place in parallel, as the first takes account of more short-term measures and outcomes, while the second analyses long-term implications.

Short-term scenario

Regarding this first scenario, a halt to gas flows via Ukraine, or an extreme ‘no Russian gas’ scenario would require Europe to reduce gas demand through urgent measures or rely on its own resources and energy production capacities. As the energy crisis escalated in the autumn of 2021, high gas prices prompted utilities to fire up

coal power plants that were held in reserve, increasing pollution and GHG emissions. Now, after Russia invaded Ukraine, the EU rolled out the RePowerEU plan to cut demand for Russian gas by two thirds in 2022 alone and to become independent from fossil fuels from the country by 2030 at the latest. (EC, 2022) However, top officials in Brussels and EU member states have acknowledged this would require turning back to coal on a temporary basis since switching on underutilized coal power plants would take the pressure off Europe's demand for gas. Restarts for industrial generation using coal instead of gas could save 10 to 15 billion cubic meters of natural gas per year, the single most effective gas-saving measure. This means, that the EU's determination to eliminate domestic demand for Russian fossil fuels by 2030 will stop short of slowing down the coal phaseout process at least in the short term. (AURORA, 2022; Walker, 2022)

In last year's COP26 agreement, parties vowed to phase out coal by 2030, but in light of the War in Ukraine, they said it would work to decarbonize the energy industry altogether by 2035. At the moment, Germany leads the energy policy turnaround in the EU, as German energy companies are already considering the possibility to get retired coal-fired thermal power plants back online, use those in reserve more and delay the scheduled decommissioning of some facilities.

The scheduled closure of a coal plant in Germany and another in the United Kingdom has already been delayed and S&P Global's analyst Glenn Rickson noted and estimated that there would be more such decisions. (AURORA, 2022) Minister of Environment, Water and Forests of Romania Barna Tanczos has stated early in 2022 that his country would temporarily restart idle coal-fired power plants, citing plans to reduce dependence on gas and oil imports from Russia. Romania earlier said it would phase out coal by 2032. Even Italy does not rule out boosting coal power capacity utilization. Italy's Minister for Ecological Transition Roberto Cingolani said the country's two active coal-fired power plants in would temporarily be "brought up to full capacity" if there is "an absolute lack of energy." (Horton, et al., 2022)

The European Commission did say it would also accelerate the deployment of renewables and green hydrogen, but it is difficult to believe it can prioritize LNG and coal at the same time as green energy. Renewable energy industry groups and international organizations have been warning that the rate of green energy investment is much too slow for the EU to meet its 2050 decarbonization goal and for the world to avoid the worst effects of global warming. If the EU, its member states and the industry invest in fossil fuels to end their reliance on Russian energy even in the short-term, the decarbonization process and the energy transition will suffer.



Figure 2 The two likely energy scenarios the EU takes following the War in Ukraine

Long-term scenario

The second scenario would see the EU switching to renewables faster than originally planned. The policies proposed under the EGD would make the European economy less dependent on energy imports and therefore more resilient, and the RE-PowerEU plan will only accelerate this process. Analysts say that European countries can quickly reduce gas dependence with energy efficiency measures and ramping up renewable energy investments, which are already in line with Europe’s ambition to stop pumping additional GHGs into the atmosphere. The EGD already supports the development of new climate-neutral technologies such as green hydrogen, biochemicals, or decarbonized materials. This would substantially reduce reliance on traditional fossil fuels, such as oil, coal or natural gas.

Russian gas imports (billion m3) cut by 2025 through the implementation of Fit for 55 plus additional clean energy solutions

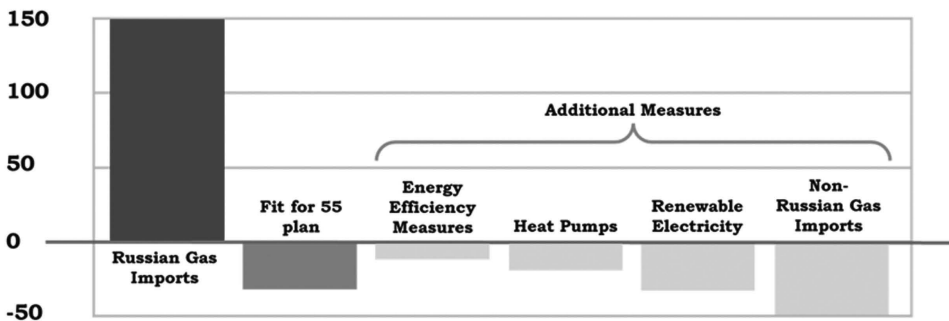


Figure 3 Russian gas imports to the EU cut by 2025

Furthermore, the EU might put forward a twin strategy for reducing its dependence on Russian gas by bringing forward green investments while swapping Russian gas for fuels from other countries. The bloc plans to ship 50 billion cubic meters of LNG each year from countries like Qatar, Egypt and the US. The EU wants to get another 10 billion cubic meters from pipes to countries like Azerbaijan, Algeria and Norway. But, unlike coal, which can be cheaply shipped around the world in its natural state, gas needs to be transported via pipelines or cooled down to extremely low temperatures that allow it to be carried in liquid form on special tankers. Moreover, LNG infrastructure is lacking in Central and especially in Eastern Europe. Building new terminals to receive LNG shipments risks locking in a dependence on fuels the EU will have to abandon to keep temperatures from rising.

Additionally, the first pilot installations of energy plants based around renewables are already being put in operation but a massive scaling up of these technologies is key. Within two weeks of the Russian invasion, the EU announced plans to install wind turbines, solar panels and heat pumps faster than ever before. The European Commission is also pushing for countries to support homes and companies to use less and produce more energy. Under that premise, the bloc could potentially reach 1 TW of solar capacity by 2030. Despite the European Commission having controversially added nuclear to its taxonomy of green energy investment, the RePowerEU initiative does not mention it at all. The Visegrad Group of countries (Czech Republic, Hungary, Poland and Slovakia) which are the most reliant on Russian gas, however, view this technology and in particular the new small modular reactors that are being developed as the main means of replacing coal and gas in all four countries.

Results

The war in Ukraine has made the EU's energy dependence on Russian gas, coal and oil painfully obvious, and the actions considered in the first scenario seem an inevitable and direct consequence of the EU's earlier unanswered questions regarding its energy policies. Even though the war demonstrates the urgency for accelerating the EU's clean energy transition this does not seem viable in the short-term considering that energy facilities that use renewables will require massive scaling up. Viewing things in a more geopolitical manner, in order for the EU to detach itself from any Russian influence as fast as possible (a period of one year) will require a step back from its decarbonization policies and switching to coal-fired power, as well as ramping up its LNG imports.

The benefits from returning to coal-fired power are fast and immediate action due to already existing power plants and interconnected electric grid with only minor adaptations and checkups required. This is favorable considering that most EU countries have their own coal deposits and do not depend on other country's resources, making the EU as a whole less vulnerable. The costs of operating existing coal plants across many European power systems were considerably cheaper than the operating costs

for gas-fired power plants for the majority of 2021. However, gas-to-coal switching pushed up global CO₂ emissions by around 250 Mt. In the EU, the increase was 16%, but this was still significantly smaller than the 21% decline in 2020. Coal accounted for over 40% of the overall growth in global CO₂ emissions in 2021. Coal emissions now stand at an all-time high of 15.3 Gt, surpassing their previous peak (seen in 2014) by almost 200 Mt. (IEA, 2022)

Research company BloombergNEF, calculated emissions from the power sector in France, Germany and Italy just before the start of the war in Ukraine. Their research showed that these emissions could be up to 14% higher from January to September 2022 if compared to the same period in 2021. However, despite the inevitable increase of emissions from coal power in the near-term, European policymakers think that the EU's climate agenda presents a vital part of the response to Russian aggression. This scenario is highly unfavorable regarding EU's long-term energy policies including the EGD considering that using coal-fired power plants might eliminate the possibility of reaching a net 55% reduction of emissions until 2030. Nevertheless, the larger benefits of reducing the EU's dependence on Russian gas will be felt in the long run, as it will indirectly facilitate the move to renewables.

This brings us to the second scenario, which is in correlation with the measures prescribed in the EGD increasing the renewable energy use, together with biofuels and green hydrogen leading to reduction of fossil fuels reliance, promoting energy efficiency, and increasing electrification. In addition, the increased use of renewables in electricity generation will contribute to the EU reaching its EGD goals, considering renewables are a cheap, clean, and potentially endless source of energy using free fuel with no emissions during operation. But, implementing actions and steps connected with the EGD goals are time consuming with results visible in a longer run, considering the demand for building new plants and infrastructure which will require great capital investments.

At the same time, the production process of renewable energy systems is highly dependent on fossil fuels, requires a lot of energy and is material intensive. In order for the EU to achieve 100% renewables by 2050 frontload investments have to be undertaken amounting to an average of about €25 billion annually until 2030, delivering 30 Mt of annual emission reductions. (Wolf et al., 2021) Moreover, plants based on renewable energy have relatively low energy return of investment (EROI) values compared to traditional conventional fossil fuel plants, meaning it will take many years to return the energy produced from these sources. Additionally, while renewable energy sources generate high quality electricity, they are less predictable and reliable, and the current energy needs do not always correlate with the disposability of the renewable energy that have to be balanced by fossil fueled plants.

Conclusion

As a result of the war in Ukraine, the EU now finds itself paying a heavy price for its excessive energy dependence on Russia. Natural gas is critical for the European industry and energy sectors, and Germany and Italy are particularly vulnerable. In the short-term, even without a ban on gas from Russia, the maximum use of all available indigenous energy resources is indispensable. Measures from suspending the phase-out of old nuclear power stations, to the ramping up of LNG purchases from a wider range of supplier countries, and even a heavier reliance on the use of coal and lignite in power generation are all part of the answer. The latter, risks reversing the decade long decline in GHG emissions from the power sector, but it should be temporary, allowing for Green Deal-aligned diversification to gather steam in the longer run. Climate concerns must remain focused on the medium- and long-term while there needs to be a readiness to be flexible in addressing short-term needs.

A geopolitical European Union can do nothing less than ensure its energy security in a manner compatible with its climate objectives. There are no easy answers, and a short-term and temporary deviation from purely climate considerations must be accepted in the interests of finding structural solution to Europe's energy security. Fortunately, in the medium- and longer-term, the goals of the EGD coincide with these related to the EU's energy security.

A climate-neutral Europe will however still not be fully energy independent. The EU should not add to nationalist pressures because of the aggression of one country, but rather uphold bilateral and multilateral cooperation on trade and development while reducing over-dependence on one country for any of its essential energy and materials imports. The EU will never be fully autonomous in energy and materials, because the supply chains of renewable and nuclear energy resources, as well as green hydrogen and associated products, will inevitably also involve non-EU countries. The EGD needs to be complemented by a trade strategy focused on diversification of essential imports, whether of green hydrogen from places where it can be produced cost-effectively, or rare earths and precious metals needed for an electrified economy.

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