

## **ИКОНОМИЧЕСКИ АЛТЕРНАТИВИ ЗА ТРАНСПОРТА И ЕНЕРГЕТИКАТА ПО ВРЕМЕ НА КРИЗА С ДОСТАВКИТЕ НА ЕНЕРГИЯ**

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**Резюме:** Русия е основен производител на енергия и суровини. Настоящият конфликт в Украйна ескалира инфлацията до екстремни нива, причинявайки смущения и провокирайки огромни рискове за глобалния растеж. Цените на Брент петрола и природния газ скочиха в началото на март, преди да паднат отново, с цена на Брент петрола в края на месеца на 103 долара за барел, а европейските цени на газа на 121 евро за мегаватчас, съответно с 33% и 55% повече в сравнение с началото на годината. Европейската комисия обяви амбициозни планове за намаляване вноса на газ от Русия с две трети преди края на годината чрез засилване на диверсификацията, енергийната ефективност и чрез ускоряване на инвестициите във вятърни и слънчеви електроцентрали. Въпреки амбицията на Комисията, мартенската среща на върха на ЕС във Версай подчерта, че краткосрочните алтернативи за руския газ са твърде недостатъчни и че намаляването на зависимостта на Европа от руския газ изисква дългосрочна стратегия.

**Ключови думи:** транспорт, енергийни ресурси, икономическа криза, алтернативни енергийни доставки

**JEL:** O18, F63

## **ECONOMIC ALTERNATIVES FOR THE TRANSPORT AND ENERGY SECTOR IN THE CRISIS WITH ENERGY SUPPLIES**

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**Abstract:** Russia is a major energy and commodity producer. The current conflict in Ukraine escalates inflation to extreme levels causes a disruption and provokes high risks to global growth. Brent oil and natural gas prices spiked early in March before falling back, with Brent oil ending the month at \$103 per barrel and European gas prices at €121 per megawatt hour, up 33% and 55% respectively since the start of the year. The European Commission announced ambitious plans to reduce imports of gas from Russia by two-thirds before the end of the year via more diversification, energy efficiency and by accelerating investments in wind and solar power plants. Despite this ambition, the March EU summit in Versailles highlighted

that there are few near-term alternatives to Russian gas and that reducing European dependency on Russian gas requires a long-term strategy.

**Key words:** transport, energy resources, economic crisis, alternative energy supplies

**JEL:** O18, F63

### **Introduction**

The paper outlines the scale of crisis that Europe is in with a focus on the crisis with energy supplies and how this affects both transport and energy sectors.

Europe is traditionally a big importer of oil and natural gas from Russia, which makes the area highly vulnerable to the Russia-Ukraine conflict. The risk of a sizeable economic deceleration as a result of a prolonged period of high energy prices could materialize in the region. Europe depends heavily on Russian gas to meet its needs, around 30-40% of Europe's supply mix but higher in some southern and eastern countries. Russian gas to Europe has increased since the 1980s.

The political changes in Europe's leadership and the escalation of the conflict resulted in an overall change of attitude towards the Russian gas and petrol. Germany halted certification of Nord Stream 2. Expectedly the European gas prices rose by 28% week-on-week<sup>1</sup>, and power prices rose by 38%.

Such increases put Europe's economy at risk of serious inflation. There are two ways to mitigate escalation one is Europe to choose to replace Russian supplies with alternative sources or the other way is to decrease the usage of Russian oil and gas.

The heavy dependence on Russian gas in Europe has been a concern for some time. The current conflict in Ukraine has made this situation far more sensitive than ever. Europe is without a doubt in an energy crisis with reserves that are significantly lower than usual that are likely to be depleted next winter.

Germany, Italy and countries from Eastern Europe are likely to be most significantly impacted by the gas stagnation, because of large Russian gas dependency and a use of energy mix that is dominated by the Russian gas. The upward trend of the prices of oil and gas imposed by the conflict in Ukraine faces Europe with one of the worst economic shocks since the 1970s. The remaining reliance on fossil fuels has caused energy prices in Europe to spiral out of control completely. European natural gas is now trading at ~\$62/mmbtu, translating to \$360 per barrel oil on an energy equivalent basis.

Cross-section experts are warning that Europe will be dragged into a deep recession if Russia puts a halt on gas supplies into Europe.

The EU leadership are throwing significant efforts and funding to lower its dependence on Russian gas by two-thirds before the end of this year and end imports completely by 2030. Such plans are bold as there is always the risk Russia to cut off vital supplies more quickly which won't allow Europe any time for adjusting. The energy in euro area is generated from natural gas (25% at least). One-third thus gas the bloc's imports from Russia.

### **1. The scope of the crisis**

#### **Cutting back on Russian gas and oil imports by Europe is easier said than done.**

The current attitude in Europe to cut back on Russian gas and oil is not supported by some leading energy experts. The further underlying constraints also come from Europe's commitments to the Green Deal and the plans to phase out Russian fossil fuels. Coal is already part of the fifth EU sanction package.

Europe is now hoping to re-charge its gas reserves during spring –summer time of 2022 but this is heavily dependent on Russia's time-planning of its responses to the sanctions especially the recently announced intentions of the EU to put an embargo on the Russian oil.

The norm is the gas storage to be filled before the start of winter. This did not happen in 2021 for the first time in years.

Europe is negotiating alternatives from North Africa, Norway, Azerbaijan and LNG. Calculations show that it would not be enough to sufficiently refill storage ahead of next winter. In this scenario, gas storage could be depleted at the start of the next winter.

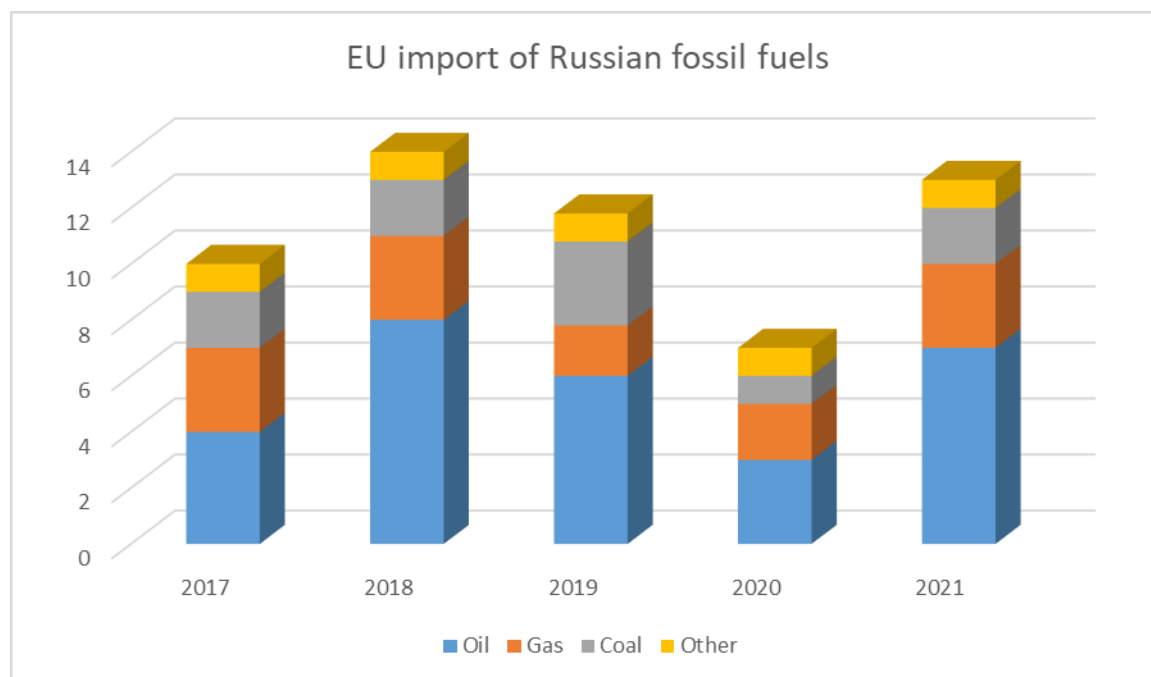
Europe will be seriously challenged once the winter arrives, especially during periods of extreme weather. LNG-exporting countries such as the US, Qatar, Algeria, and Australia are already operating near maximum capacity. Furthermore, more LNG import capacity and pipelines would have to be invested in and built, which takes years to complete and comes with significant costs. Another route is the Liquid Natural Gas (LNG) capacity in Spain, which again should be carried via pipeline infrastructure for the Russian gas. This will inevitably generate further costs and investments and will result in an increase of gas prices.

The same counts for renewable and nuclear energy: wind parks, solar fields, and nuclear power plants are not put up overnight. Having said that Europe could start burning coal and heating oil, but that would definitely come at the expense of Europe's climate goals. Europe lacks alternatives to replace the Russian gas in the short term.

Banning Russian supplies, would push the Eurozone economy into a deep recession. The scenario where the EU only targets Russian oil imports may also result in a European recession. Cutting back on imports of Russian oil though seems to generate fewer problems than cutting off Russian gas deliveries.

Considering that the import of Russian oil does not happen via a pipeline infrastructure explains the political talk of intentions to ban oil imports only.

In 2020, the EU imported roughly 170 million tons of crude oil and petroleum products from Russia, which is equal to 3.4 million barrels per day (mb/d).



*Figure 1. EU import of Russian fossil fuels  
Source: UN com trade database, Rabo Research*

In case of a ban on Russian oil imports, Europe would have to resort to alternative sources:

1. There is a clear reluctance from OPEC countries to increase oil extraction capacity and thus to meet additional European demand for oil. Having said that OPEC has increased up to 4mb/d spare capacity, but it is important to keep in mind that Russia is part of OPEC+ and as such can influence the decision-making process.

2. US potential for oil supply may be an option due to its political reasons to do so.

3. Lastly, there are even talks about shifting sanctions from one party to another, for instance with countries like Venezuela to ease sanctions in exchange to additional oil deliveries. How can this be justified geopolitically is another matter?

There other significant technical details that may represent serious hurdles for the European refineries. For instance, many European refineries use a blend of Urals, which have a specific density and sulphury content. These refineries cannot change their blend profile overnight. To prevent loss of efficiency, crude oil with the same profile is needed, which is a highly unrealistic expectation.

This makes the short-term transition from Russian oil almost impossible to achieve.

The expectation is the oil prices to rise to USD 200 per barrel in the event of a European combined embargo on Russian gas and oil. In case of an embargo on Russian oil only (excluding gas), the expectation is gas prices to spike to more than USD 170 per barrel. Oil soared to \$110 as details on the European Union's plans to ban Russia oil continue to be revealed and digested by the market. Up 4.75% on the day as of 1:53 p.m. EST, oil prices are responding to additional details on European Union plans to embargo Russian oil, including through sanctions on insurance companies.

Oil is also responding to rumblings from a meeting earlier today of OPEC+ and the Joint Technical Committee (JTC), which signaled the likelihood that no

further oil output increases beyond the previously discussed 423,000 bdp commitment for June would be forthcoming.

### **How big will the economic impact be?**

Higher gas -and other energy- prices and commodity prices have already contributed to surging inflation. It is a chain reaction triggered by the time –balance of sanctions and contra-response to sanctions between Europe and Russia.

The economy is pressed by two side, at one side are the consumers who receive higher petrol and electricity and heating bills and at the other side are the producers whose production costs are rocketing high up. Their products become so highly priced that switch onto a survival mode not profiting making one.

This situation calls for urgent measures and interventions from the governments because the relationship is quite simple: the less gas we have, the higher the price. There are serious risks of shortages for products that are highly energy intensive to produce, such as fertilizers and multiple basic metals.

All economists are aware that once the inflation triggers up the economic growth has a tendency to slow down regardless of the policy reaction. The conflict in Ukraine will push the energy prices even higher. The expectations is of at least +30% increase in the energy bill for 2022. This will immediately reflect badly on the low-income households in Europe.

## **2. Alternatives to the transport sector**

The expectation is the oil prices to rise to USD 200 per barrel in the event of a European embargo on Russian oil. Following the events OPEC+ and the Joint Technical Committee (JTC), signaled the likelihood that no further oil output increases beyond the previously discussed 423,000 bdp commitment for June would be forthcoming, laying out the prospect of shortages as well.

The ongoing shift towards the usage of electric vehicles in Europe is quite slow. Experts look at renewables for the production of electricity to be employed by these vehicles.

Green energy is an important part of the electricity mix, its share in the overall electricity flow continues to be meager. Renewable energy sources contribute only 38% to the European electricity mix in 2020, substantially overtaken by fossil fuels. Sectors such as heavy industry, with huge energy needs to process heat from burning fossil fuels, for example, making them difficult to electrify, and a lack of grid infrastructure to transport green power from areas of production to areas of demand, are largely to blame.

Speaking of transportation in 2019, transport accounted for nearly 30% of global final energy use and 23% of total energy sector direct CO<sub>2</sub> emissions. Reducing oil use and CO<sub>2</sub> emissions in long-distance transport modes – heavy-duty trucking, maritime shipping and aviation – are particularly difficult because of their energy and power density requirements.

Battery electric vehicles (BEVs), Hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs) are already reducing the use of oils and the vehicle emissions, particularly in passenger vehicles.

Partly detaching transport from oil usage would require deployment of alternative fuels such as green hydrogen-powered electric cell electric vehicles (FCEVs) and battery electric vehicles (BEVs). Green Hydrogen is the leading technology for the transport sector, including trucking and shipping. Additionally, to lowering CO<sub>2</sub> emissions, this can support local air quality improvements and noise reductions.

Green hydrogen energy market has been in the focus for a while now, being driven by net zero targets. Europe represented by the policy leaders is vesting most of its green hopes on hydrogen. There's a new concept that sees billions of euros in investment flowing into the clean technology and fueling a climate friendly economic recovery. Transformative EU green hydrogen package is being shaped up with target spend of 150 billion by 2030. The massive challenge is twofold, at one hand to boost the capacity to supply renewable hydrogen and on the other to lower down the prices of this fuel.

The biggest challenge and the one of utmost importance is the production of green hydrogen from renewable energy sources - green hydrogen. This is the hydrogen produced through the electrolysis of water with renewable energy. The technology exists and requires some fine-tuning that has been delayed for many years. It seems that the potential of green hydrogen is still vastly underappreciated.

### 3. Alternative energy supplies

The most obvious exit paths deal with a shortage of gas is to interchange Russian gas with non-Russian gas imports. There's significant unused capacity of gas imports from other sources, except for higher utilization of gas import capacity, production quotas must be revised upwards.

Europe's domestic production /including Norway /is already near maximum. There's little scope for extra upward flexibility from Europe's largest producers, including Norway, UK and also the Netherlands. Smaller suppliers like Poland and Romania could make a little difference, but not significant.

North African supply responds to low Russian flows in 2022-24. Suspension of NS2 ends up in North African imports increasing through 2024. Assumption goes for a restart to the 12bcm/a Magreb-Europe pipeline. A political dispute between Algeria and Morocco has blocked the agreement needed to restart the road.

There are different steps that can be made to replace Russian gas. Countries like Netherland and Norway have made some steps towards increasing their extraction capacities but there are many constrains to overcome.

For instance, Netherlands has safety concerns over earthquakes triggered by this activity, the other potential supplier -Norway has recently changed its national regulation to permit for more fossil fuel extraction from key fields to keep production at full tilt throughout the summer.

Europe does not have enough gas available to cover the volumes imported from Russia. Much of Europe's gas is supplied through the central and eastern European pipelines from the east to the west, which aren't suitable to facilitate the so-called 'reversal flow' technology. It is unlikely that it'll be technically possible to produce Eastern-Europe with gas on a brief notice.

The other stream of measures that Europe is looking into is the potential of renewable energy. During the pandemic in 2020 the share of renewable electricity only grew to 38%, this was in part because of a significant but temporary drop in demand of about 6%.

While the costs and probability of the EU meeting its 40% renewables goal has not yet been subject to rigorous analysis, even in 2018, of the entire EU energy mix including transportation and industrial energy, natural gas was the leading electricity source, ahead of renewable wind and solar, coal and nuclear. **In 2019, natural gas was again the largest single source of electricity in the European Union, greater than renewables, nuclear, coal or any other source.**

The renewables are a good option but the rule is that total installed renewable capacity should be three to eight times larger than peak demand. The current capacity is not enough and much of it is used through the electricity grid or stored in batteries or pumped from storage systems. Big ships and long-haul trucks are still not equipped with batteries large enough to permit the longer distance transportation.

Renewable energy costs are falling alongside volume deployment. Energy storage and grid balancing are increasingly important.

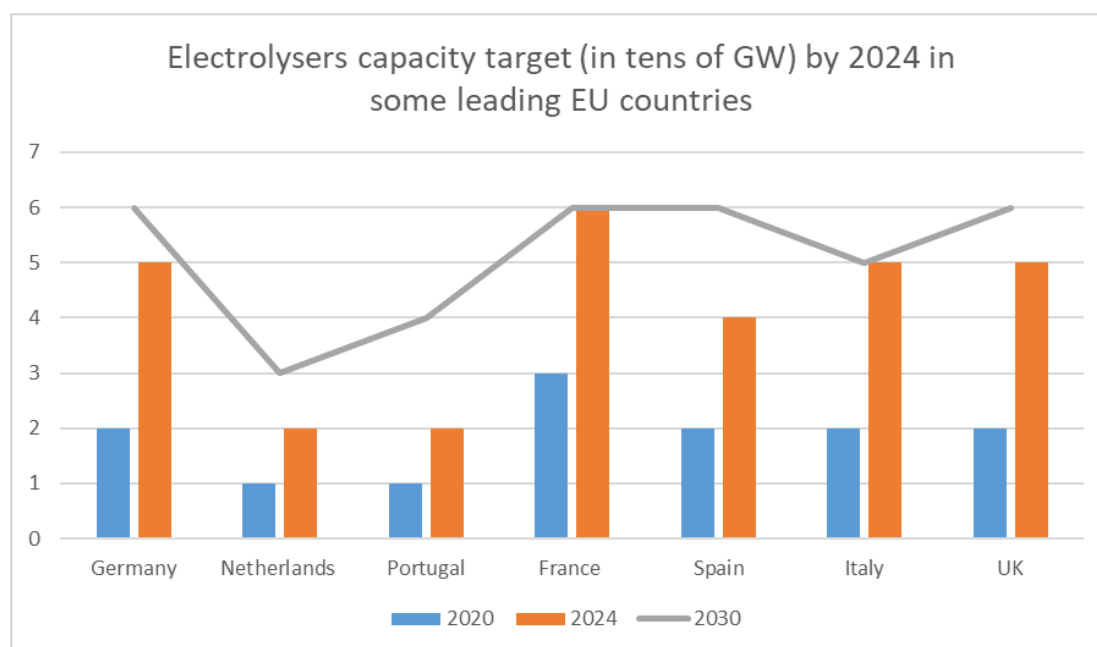
The best long-term options are indeed investments in renewable energies, such as:

- Solar panels
- Wind turbines
- Green hydrogen

In just the last decade, a series of significant clean energy supply options have become available in Europe to displace both the EU's reliance on coal and Russian gas. These include of course renewable energy, especially wind and solar, which the EU "Fit for 55" plan is prioritizing, counting on a dramatic increase in EU renewables production to fully 40% of total energy.

Yet many EU nations have developed important new liquefied natural gas ports to diversify gas imports away from over reliance on Russia. Taken together, renewable energy, cleaner LNG, and new electricity storage technologies can help balance the EU energy supplies longer-term.

Renewable energies won't be able to fill the availability gap within the short run. It seems that governments are searching for ways to speed up the process of expanding on renewables by removing bureaucratic barriers and by increasing investments in such. **Europe's dependence on fossil fuel supply from Russia have prompted the EU and lots of its member states to explore green hydrogen development.**



*Figure 2. Electrolysers capacity target by 2024*  
*Source: the author (Eurostat, 2021)*

Although costs of green hydrogen production may drop in the future, the prospect of using home-grown energy resources-wind and solar-rather than counting on gas imports from Russia is now paramount for policymakers within the West.

The consumption of gas may be reduced by improving gas use efficiency by households, but consumer gas demand is extremely inelastic. The other option, which is already in motion-planning stage is to force non-critical and energy intensive industries, like the chemical and metal industry, to close up in an emergency scenario.

### **Conclusion**

The acute geopolitical escalation between Russia and Ukraine raises the likelihood of an extension of the natural gas crisis in Europe. This crisis, has contributed to the sharp rise in Europe's natural gas price. Europe's natural gas price will remain high in the coming months and towards the second half of 2022, the natural gas shortage may increase.

Inevitably, there will be a substantial increase in gas prices, which will ultimately result in lower demand for natural gas. The demand side of natural gas consists of three key sectors: residential and commercial heating and cooking, power generation, and industrial demand.

European institutions are discussing the launch of an energy and defense fund and a new issuance of European bonds, which could be critical to cushioning sharply rising energy costs. Individual countries, such as Germany, France and Italy, are also approving measures to absorb part of higher energy bills for households.

Industrial production remained stable for many European members with the exclusion of Italy, which posted a drop of 3.4% in January that may reflect how component shortages and the energy shock are starting to hurt manufacturing activity. There will be a tendency of moving natural gas-intensive plants from Europe to much cheaper alternative destinations such as Mexico or the US, where natural gas currently trades at a fraction of European prices, and that cost gap would only widen in this extreme scenario.

The energy crisis induced by the Russian/Ukraine conflict will move many governments to accelerate their energy transition plans, creating significant growth in the obvious beneficiaries from such a transition but also in some less obvious areas.

Ultimately, to conclude it seems that Europe has no painless alternative to Russian gas and, in the event of lower supply due to a sudden cutback, overall demand for gas in Europe would have to decline by 10 percent to 15 percent as an immediate measure.

Fact is the immediate measures may mitigate the consequences, but inflation would be inevitable. Longer-term solutions would require meticulous planning and a high level coordination of the implementation of the measures.

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