

CONSIDERATIONS REGARDING THE ENERGY CRISIS STARTED IN 2021

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Abstract: *The paper "Considerations Regarding the Energy Crisis Started in 2021" presents the main causes and consequences of the current energy crisis, as well as a series of measures established by the European Commission, aiming at maintaining the stability on the European natural gas markets, ensuring Europe's independence from the fossil fuels of Russia well before 2030, accelerating the transition to green energy, while increasing the resilience of the EU's energy system.*

Keywords: *energy crisis, energy transition, EU measures.*

JEL Classification Codes: **F51, F63, H23.**

1. INTRODUCTION

The decrease in the supply of energy resources followed by an increase in the prices of these resources results in the energy crisis. Mankind has faced several crises due to dwindling natural reserves and increasing demand.

But the current global energy crisis differs from the previous episodes because, given the fuel market integration, it includes an oil crisis, a gas crisis and an electricity crisis at the same time, threatening the entire world economy. Triggered in 2021 by the global economic recovery after the recession related to the Covid-19 pandemic in 2020, it was amplified in 2022 by the invasion of Ukraine by Russia.

The European Union is more vulnerable to rising energy prices because it is highly dependent on natural gas coming from Russia up to 40% % through gas pipelines and accounting for 25% of energy consumption in Germany and Spain and over 40% in Italy, for example.

Among the Eastern European states heavily dependent on Russian gas imports, Romania has a relatively privileged situation, being a gas producer. However, the share of imports in total consumption has increased in recent years, exceeding 20% in 2021 (Energy Policy Group, 2022).

The Versailles Declaration of 11 March 2022 set out a series of restrictive measures adopted by the EU in response to the crisis in Ukraine, with European leaders stating the need to eliminate imports of hydrocarbons from the Russian Federation.

Through the REPowerEU plan, the European Commission proposed concrete measures to make the EU independent of natural gas imports from Russia by 2027. The objective of the plan at the end of 2022 is to reduce the European Union's dependence on Russian gas by two-thirds.

The Commission also proposed the obligation to store 80% of the total storage capacity by November 2022. Significant efforts will be made to rapidly increase the use of sustainable energy in the long term, with the plan supported by financial and legal measures to build the new infrastructure and the new energy system that Europe needs.



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2. CAUSES OF CRISIS

The global gas market was highly volatile in 2020-2021, with fluctuating prices and periods of both oversupply and market contraction.

Given the restrictions imposed in most countries of the world due to the Covid-19 pandemic, the economic activity slowed down, the gas demand decreased, leading to a drop in the natural gas prices with record lows at the three major natural gas hubs and reduced investments in that sector. As a result, in 2020, the global gas production decreased by 3.5%. The United States, Europe, Russia, Africa, and the Asia-Pacific region experienced declines in production levels, as Figure 1 shows.

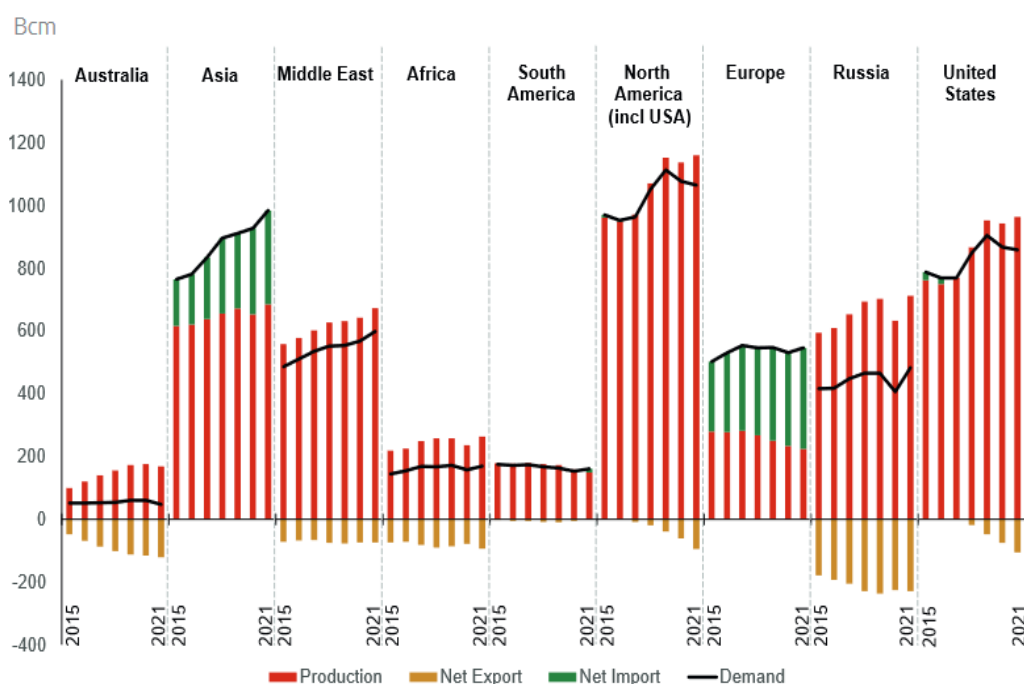
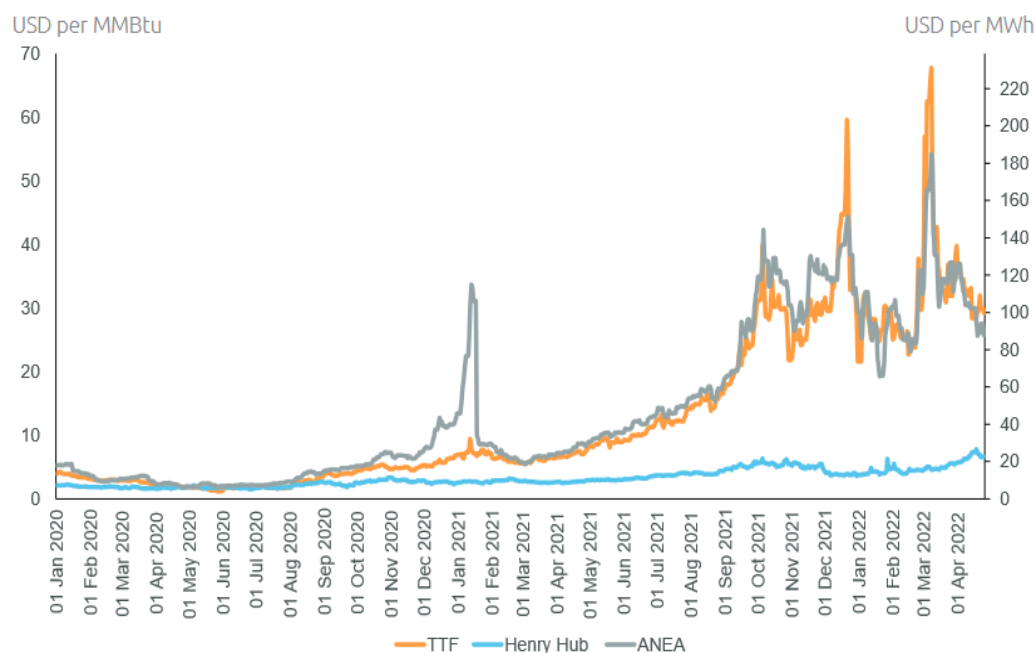


Figure 1. Global gas production and import/export volumes, split by continent

Source: International Gas Union, *Global Gas Report, 2022*, available at: <https://www.igu.org/resources/global-gas-report-2022/>, page 19
[accessed on September 3, 2022]

The relaunch of the economic activity in 2021 boosted consumption in the industrial and energy sectors leading to a 4% increase in the global gas production. As Figure 1 shows, the gas production in the US, Russia and the Middle East has been accelerated to meet the rising demand in Europe and Asia. Despite the higher demand, the European gas production fell by 4% due to the growing pressure to cut emissions and the transition to low and zero emission technologies.

The increasing dependence of Europe and Asia on imports has led to a direct competition between the two regions for gas supplies, with gas prices on an upward trend, with both Asian spot gas reference prices and TTF reaching record levels at the end of 2021, as Figure 2 shows.



Note: TTF = Title Transfer Facility; ANEA = ARGUS Northeast Asia des price assessment

Figure 2. International natural gas Front Month prices

Source: *International Gas Union, Global Gas Report, 2022*, available at: <https://www.igu.org/resources/global-gas-report-2022/>, page 21 [accessed on September 3, 2022]

The combination of strong demand in Europe, the fierce competition from Asia for LNG imports, the lower flows from Russia and the relatively low storage at the beginning of 2021 winter heating season is causing a natural gas supply crisis (Buli & Chestney, 2021).

The outbreak of the Russian-Ukrainian conflict at the end of February 2022 propelled the European gas prices to new records, Figure 3 shows. Given the general uncertainty regarding the Russian gas exports to Europe, the price of natural gas at the TTF (Title Transfer Facility) hub in the Netherlands reached 227 Euros per MWh on March 7, 2022, 56% higher than in February and about 13 times higher than the same period of 2021.

After a short period of decline, on June 8, 2022 it resumed its upward trend, reaching in August 2022 the level of 339 Euros per MWh, which also represents the maximum of the last 12 years, because the decreasing probability that the Russian gas reaches Europe through the Nord Stream 2 pipeline has amplified the pressure on the market. The Russian company Gazprom cut flows through the key pipeline to about 20 percent in July and warned that the link's entry point must undergo technical maintenance every 42 days.

In November, the Dutch natural gas futures traded below €100 per megawatt-hour as the expectations of mild weather weighed on demand. However, the uncertainty over flows through the Yamal pipeline remains as the geopolitical tension with Moscow rises, while flows through Nord Stream 1 have already been ignored due to the pipeline's damage. Meanwhile, constraints remain on how much LNG Europe can import, as global competition for LNG could draw cargo to other markets.

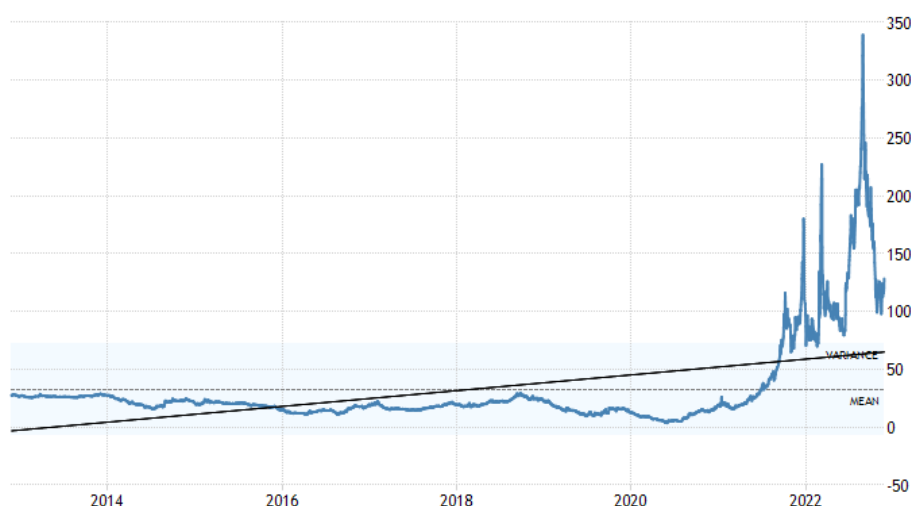


Figure 3. Natural Gas EU Dutch TTF (EUR/MWh)

Data source: <https://tradingeconomics.com/commodity/eu-natural-gas>
[accessed on November 18, 2022]

According to the Trading Economics' global macro models and analysts' expectations, the EU natural gas is expected to trade at EUR 319.62/MWh by the end of Q3 2023, as Figure 4 shows.

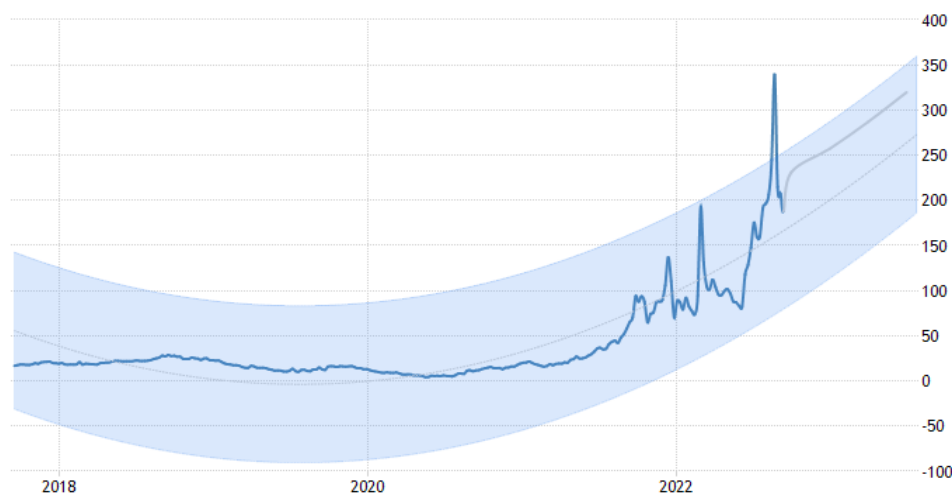


Figure 4. Natural Gas EU Dutch TTF (EUR/MWh) Forecast

Data source: <https://tradingeconomics.com/commodity/eu-natural-gas>
[accessed on September 17, 2022]

3. CONSEQUENCES OF THE CRISIS AND MITIGATION MEASURES

The natural gas plays a catalytic role on the global energy markets because it is used in many branches of the economy and is a marginal fuel in the energy sector, determining the price of electricity (Gilbert et al., 2021).

The increase in the price of natural gas produces chain effects, also influencing the increase in the prices of food products.

Since the natural gas is a key ingredient in the process of manufacturing nitrogen-based fertilizers used on a number of crops, the fertilizer prices have followed the lead of natural gas

prices. Moreover, in the year 2021, given the tripling of TTF natural gas prices in the Netherlands, some factories in Europe stopped or even reduced the production of fertilizers.

Since fertilizers represent one of the largest non-fixed input costs for grain and oilseed farmers, the prices of agricultural products and implicitly those of food products began to rise in 2021, as Figure 5 shows.

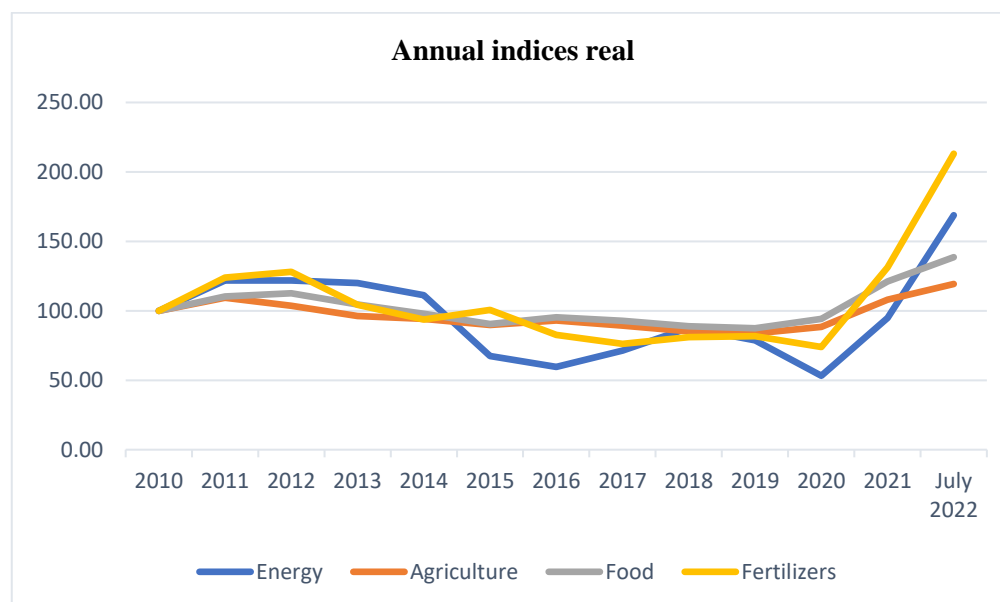


Figure 5. Annual indices real, 2010=100, real 2010 US dollars

Data source: <https://www.worldbank.org/en/research/commodity-markets>
[accessed on September 1, 2022]

Although in the first half of 2022 the growth rate of agricultural and food prices was lower than in 2021, the domestic food price inflation remains high around the world.

According to the World Bank, the information between April and July 2022 show high inflation in almost all low-income and middle-income countries, 92.9 percent of low-income countries, 92.7 percent of lower-middle-income countries, and 89 percent of upper-middle-income countries have seen inflation levels above 5 percent, with many experiencing double-digit inflation.

The share of high income countries with high inflation has also increased sharply, with about 83.3 percent experiencing high food price inflation. (<https://www.worldbank.org/en/topic/agriculture/brief/food-security-update>, accessed on September, 2022).

The explosion of energy and food prices led to an increase in the annual inflation rate in the euro market to 9.9% in September 2022 compared to 3.4% in September 2021, as Figure 6 shows. Thus, the inflation level is five times higher than the target objective of the European Central Bank (ECB), respectively a price increase of 2%. This is the strongest annual increase in consumer prices recorded by the euro area since 1997, when the statistical data on the common market began to be published.



Figure 6. Harmonised Index of Consumer Prices inflation rate - Overall index, Euro area (annual percentage changes)

Data source: https://www.ecb.europa.eu/stats/macroeconomic_and_sectoral/hicp/html/index.ro.html
[accessed on October 14, 2022]

In Romania, the annual inflation rate increased to 15.9% in September 2022 compared to September 2021, according to the National Institute of Statistics. In August, the annual inflation rate had been 15.3%.

The high gas prices overcoming the coal prices due to the post-pandemic energy demand growth, the insufficient supply compared to the demand in 2021-2022 and the Russian-Ukrainian conflict in 2022 led to the switch from gas to coal, especially in the energy production sector with the consequent increase in carbon emissions.

However, the global greenhouse gas emissions will need to be reduced by at least 55% by 2030 compared to 1990 levels to limit the global warming to around 1.5°C and reach net zero by the early 2050s, targets set in the Paris Agreement by all 27 EU member states (<https://www.consilium.europa.eu/ro/policies/climate-change/paris-agreement/>).

The governments, the policy makers and the industry should develop realistic and achievable strategies to drive significant emission reductions across all sectors. In the medium term, the natural gas should play a key role in reducing direct emissions by replacing coal and oil, though the rising gas prices could produce recurrent market crises. In the short term, the LNG shipping will cover most of the demand, until the regasification capacity and the pipeline expansion begin to meet demand by 2030.

Although critical, the trajectory of the energy transition is "technologically and financially feasible as the energy models attest" (International Energy Agency, October 2021).

The fluctuations on the energy market affect the competitiveness of companies and implicitly the economic growth, as they can induce significant economic damage - directly, due to price increase, and indirectly, due to investment uncertainty and constraints on households' disposable income.

The graph below illustrates the correlation between the liquid fuel consumption and the GDP growth.

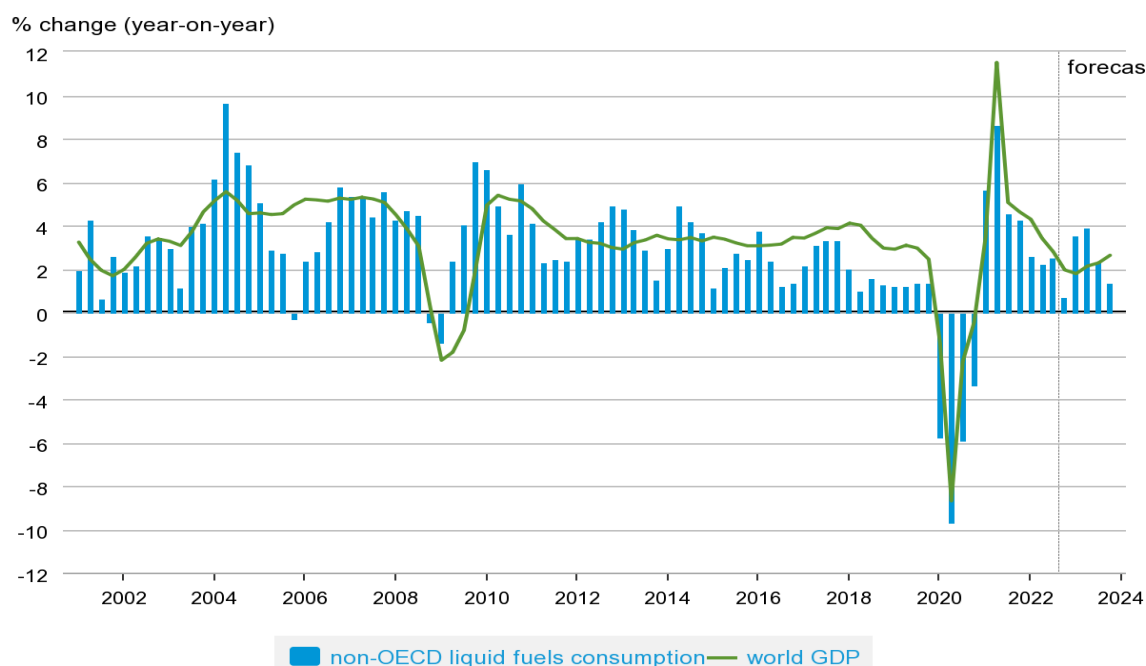


Figure 7. Non-OECD liquid fuels consumption and GDP

Source: <https://www.eia.gov/finance/markets/>
[accessed on October 30, 2022]

Based on the positive correlation described in Figure 7, it can be deduced that a higher economic output usually indicates an increased use of energy products, a decrease in the consumption of the latter leading to a decrease in GDP.

According to the estimates of international institutions, the slowdown of the economic activity in Europe and all over the world in 2023 will be the result of the current geopolitical context, the crisis of energy resources in Europe and the international inflationary forecasts, seconded by the slowdown of the dynamics of the Chinese economy and interruptions in the supply chains.

The National Forecasting Commission has estimated a weakening of activity for Romania in 2023 compared to 2022.

The maintenance of high prices for energy products and the weakening of the industry in Germany - Romania's main trading partner - will affect the domestic industry in 2023 as well, even under the presumption of Ukraine conflict ending (<https://cnp.ro/prognoze-macroeconomice/> accessed on November 9, 2022).

Rising energy prices have particularly affected people, considered energy vulnerable. This has exacerbated divisions and inequalities both within the societies of the member states and between the member states of the European Union. In the ecological transition, alleviating energy poverty in one of the world's richest continents is attempted through measures such as capping energy taxes, setting energy price ceilings, subsidizing consumers and redirecting profits from energy companies.

In order to reduce the bills for the Europeans, the European Commission proposed on September 14, 2022 exceptional measures to reduce the demand for electricity, and to redistribute the surplus of income from the energy sector to final consumers (https://ec.europa.eu/commission/presscorner/detail/ro/ip_22_5489).

- the obligation of the member states to reduce the electricity consumption by at least 5% during peak hours and to also consider reducing the global electricity demand by at least 10% by March 31, 2023.

- the temporary capping of the revenues of "inframarginal" electricity producers, who, thanks to the use of renewable energy sources, nuclear energy or lignite, supply electricity to the network at a lower cost than the price level set by the more expensive "marginal" producers. These inframarginal producers have made exceptional revenues with relatively stable operating costs as expensive natural gas-fired power plants have driven up the wholesale price of electricity they operate. The inframarginal revenue cap is set at EUR 180/MWh to allow producers to cover their operating and investment costs. The revenues above the cap will be collected by the member state governments and used to help energy consumers reduce their bills. The member states trading electricity are encouraged, in the spirit of solidarity, to enter into bilateral agreements to share part of the infra-marginal revenues collected by the producing state for the benefit of end-users in the member state with low electricity production.

- a temporary solidarity contribution from the surplus profits generated by the activities in the oil, natural gas and refinery sectors that are not covered by the inframarginal income ceiling. This contribution would be collected by the member states from the profits of the year 2022 whose growth, compared to the average profits of the last three years, exceeds 20%.

The revenues collected by the member states will be redirected to the energy consumers, especially the vulnerable ones, the hard-hit businesses and the large energy-intensive industries. The member states can also finance cross-border projects in line with the objectives of the REPowerEU plan or use part of the revenues for the joint financing of measures to protect employment or promote investments in renewable energy sources and energy efficiency.

REPowerEU is the European Commission's plan, proposed on March 2022, aimed at ensuring Europe's independence from Russian fossil fuels well before 2030, reducing dependence on Russian gas by two-thirds by the end of 2022 and accelerating the transition to green energy, given Russia's invasion of Ukraine. It is backed by financial and legal measures to build the new infrastructure and energy system that Europe needs.

The short-term measures aim at: (https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en)

- joint purchases of gas, LNG and hydrogen via the EU Energy Platform,
- new partnerships in the field of energy with reliable suppliers,
- rapid implementation of solar and wind energy projects, combined with the use of hydrogen from renewable sources,
- increasing biomethane production,
- filling gas storage facilities to 80% of capacity by November 1, 2022,
- EU-level coordination of demand reduction plans in case of gas supply interruption.

The medium-term measures to be completed by 2027 refer to: (https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en)

- new national REPowerEU plans under the amended Recovery and Resilience Fund – to support €300 billion of investment and reforms,
- stimulating the de-carbonization of industry with projects worth EUR 3 billion under the Innovation Fund,
- new legislation and recommendations for a faster authorization of renewable energy sources, especially in specific areas, suitable for the development of renewable energy sources, with reduced environmental risk,
- investments in an integrated and adapted network of gas and electricity infrastructure,
- setting a higher value, from 40% to 45%, for the EU's 2030 renewable energy target,
- regulatory measures to increase energy efficiency in the transport sector,
- a hydrogen accelerator to supply EU industry with 10 million tonnes of hydrogen produced in the EU from renewable energy sources.

4. CONCLUSIONS

The energy crisis, aggravated by the war in Ukraine, is generated by the imbalance between demand and supply.

The impact on the Eurozone is considerable, as Russia is its main supplier of energy products, covering 20% of oil demand and 35% of natural gas demand in 2020. The outbreak of the conflict has exerted significant pressure on the raw material prices.

High energy prices also mean higher prices for other goods, especially food. Expensive energy and raw materials reduce the competitiveness of businesses and affect the economy.

The ECB estimates that a disruption in the supply of energy products will weigh on real GDP growth in the Eurozone in 2022 and further dampen economic activity in 2023, after which it will exert a reduced impact on growth in 2024 due to gap-filling effects.

The rising fossil fuel prices have particularly hit the vulnerable household consumers, who spend a large proportion of their total income on energy bills, exacerbating disparities and inequalities across the EU.

In order to alleviate the price pressure felt by the European citizens and industry and to ensure the supply security, the European Commission has proposed a series of measures such as price capping mechanisms on the FTT gas exchange, reducing gas and electricity demand, gas storage and the redistribution of exaggerated profits from the energy sector, the transparent use of infrastructure, joint purchases of gas, the exercise of solidarity between member states etc.

The ongoing energy crisis underpins the case for the energy transition and the fight against dangerous global warming. Accelerating the transition to green energy will reduce emissions, reduce dependence on imported fossil fuels and protect against rising prices. The timing of this change is crucial, as power plant shutdowns could lead to tight supply and higher prices meanwhile.

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