

THE IMPACT OF ENERGY CRISIS ON EUROPEAN UNION'S INDUSTRIAL SECTOR

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ABSTRACT: *The geopolitical issues related to the war between Russia and Ukraine had dramatically highline the energy price crisis. Russia is by far the main European Union supplier of crude oil, natural gas and solid fossil fuels and replacing its energy supply to the European Union would be a major challenge in the short-term. Europe's industrial sector depends heavily on natural gas as an input factor. When energy prices raised, industrial employment in the European Union had actually increased, both in terms of people employed and hours worked, compared to the same period in the last year. With energy bills rising to unaffordable levels, companies all over Europe have already registered for a temporary unemployment system with gloomy predictions regarding the loss of a significant number of jobs.*

KEY WORDS: *economy, energy, industry, employment, policymakers, EU.*

JEL CLASSIFICATIONS: *J2, J6, R0, R1.*

1. INTRODUCTION

Historically, the European Union countries have been heavily reliant on energy supplies from Russia. In 2020, the share of Russian gas accounted for more than 75% of total gas imports in the Czech Republic, Latvia, Hungary, Slovakia and Bulgaria. Amid rising tensions between Moscow and the West in recent years, multiple European Union countries have taken steps to lower their dependence on Russian supplies by investing in regional interconnections, LNG import facilities, and renewable energy. More recently, in the context of steadily declining gas supplies from Russia, governments have been racing to fill up gas storage facilities and roll out national energy efficiency and savings plans.

Russia's invasion of Ukraine in February 2022 made clear that Europe's dependency on energy imports from Russia was a great strategic liability. The energy crisis that followed, showed how decoupling from Russian gas has become essential. In

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the decoupling effort, European industry, accounts for more than 30% of total European Union final demand for electricity and natural gas, has a major role to play.

Industry uses energy, primarily natural gas and electricity for four main purposes:

- production of heat in industrial processes and for space heating in buildings;
- feedstock to make products including plastics and chemicals;
- generation of steam for process heating and generation of electricity to run industrial processes;
- to power machinery and industrial motors, lights, computers and equipment for heating, cooling and ventilation.

European governments have started to implement a range of policy responses. One class of policies aims to mitigate the impact of higher costs on consumers and businesses. These include retail price caps, regulated tariffs, support programs for energy-intensive companies, and liquidity or capital backing for energy companies, including even nationalization. Another class of measures seeks to stabilize and reduce wholesale prices and ensure energy security. This includes policies to encourage energy savings and increase supply but also to cap energy costs, particularly wholesale gas prices (Nimară, 2022).

2. THE ENERGY DEPENDENCY OF INDUSTRIAL SECTOR

Europe's industrial sector depends heavily on natural gas as an input factor. In 2020, natural gas accounted for 32 % of the final energy consumption of the EU's industry (figure 1). Since natural gas has a roughly 40 % lower carbon intensity than coal per unit of energy content, it was long promoted as a transition technology to facilitate the shift away from coal power generation (Nacke & Jewell, 2022).

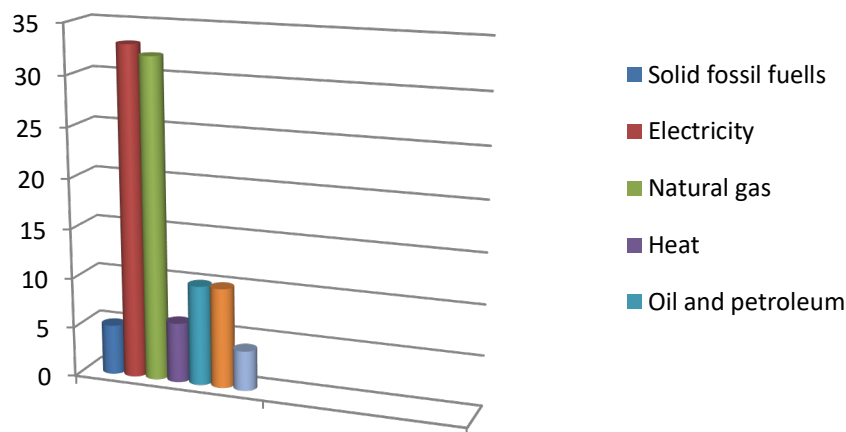


Figure 1. The energy consumption of the European Union's industry

However, most industrial producers can't easily switch from natural gas to a different type of energy. These adjustments require time and large up-front costs and

alternatives are often inferior to gas-operated industrial processes. For example, operational expenses are about two to three times as high using electrical instead of gas-powered furnaces. Moreover, delivery times for necessary components are currently very long due to persistent supply chain problems.

Energy-intensive industries, such as chemicals and petrochemicals, cement, paper, iron and steel, are hit very hard by soaring energy costs. These industries play an important role for Europe's economy. The iron and steel, minerals, refineries and chemical industries combined employed an estimated 3.2 million people in the European Union in 2021, accounting for about 11% of total industrial employment.

They also contributed about 15% of total value added of manufacturing. Since a large share of energy-intensive products are intermediate goods, any disruptions to production can have a wider impact on industrial output and competitiveness (figure 2).

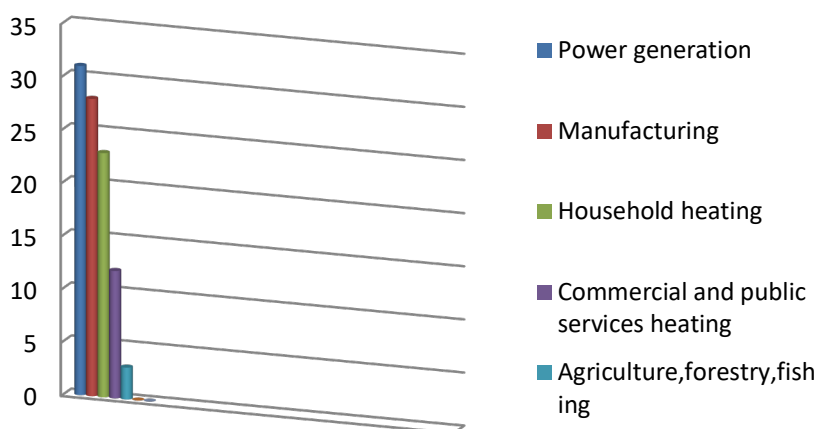


Figure 2. The use of gas by different economic sectors in the European Union

Gas is the most important source of energy for Europe's industrial companies. But gas is also an important feedstock, used in the chemicals and fertiliser industries. In total, the industry consumes about 27-28% of the total supply.

Due to their production structure, some countries are affected more severely by the energy crisis than others. Germany, for example, combines a large manufacturing sector with high energy use in industrial production.

In 2021, value added of the manufacturing sector accounted for 18% of GDP, about twice as much as in France or Greece. Industrial energy use in Germany is concentrated in the chemical and petrochemical, non-metallic minerals (which includes cement, ceramic, and glass), and iron and steel industries (figure 3).

In the last year and especially since the start of the war in Ukraine, the performance of energy-intensive and non-energy-intensive industries in the European Union has increasingly diverged (Grubb, et al., 2021). In September 2022, output in energy-intensive industries was 6% lower than at the beginning of the year. In Germany, annual production in the chemical industry is estimated to decline by 8.5% in 2022. One in five intermediate goods producers in Germany has reported production cuts because of increasing energy prices.

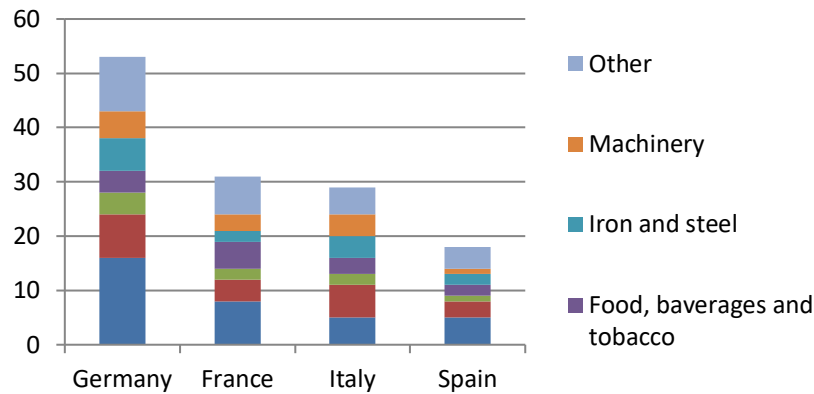


Figure 3. Industry of the most affected countries from EU by energy crisis

More than one business in four in the chemicals sector and 16% in the auto sector were being forced to cut production, a survey of 24,000 businesses by the German chambers of commerce and industry (DIHK) showed. Moreover than 17% of auto sector companies are planning to move some production abroad.

European industry has been shifting production to locations with cheaper labour and lower other costs for decades, but the energy crisis is accelerating the exodus (Xu, et al., 2022).

Most decreases in demand will come from energy-intensive and gas-intensive sectors such as chemicals, steel, ceramics, manufacture of other materials and fertilisers cutting back on production or closing down for long periods. Industrial production has already begun to fall sharply in these sectors (figure 4). The decline in output, and its knock-on effects on prices, the labour market and consumer confidence, will exacerbate the recession in 2022-23 and slow the subsequent recovery.

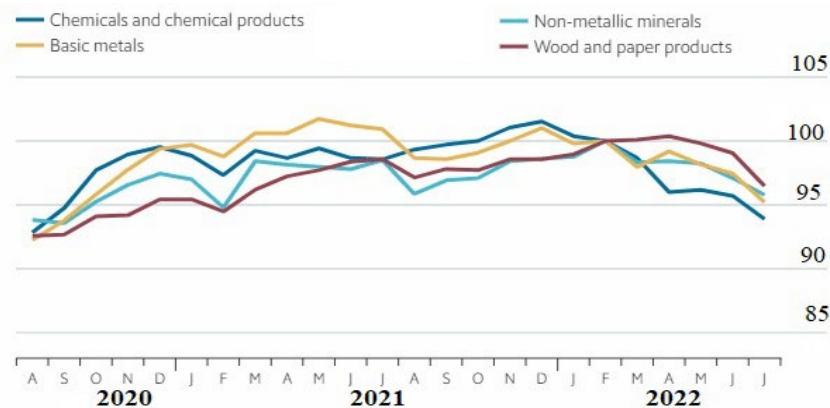


Figure 4. EU's industrial production by sectors

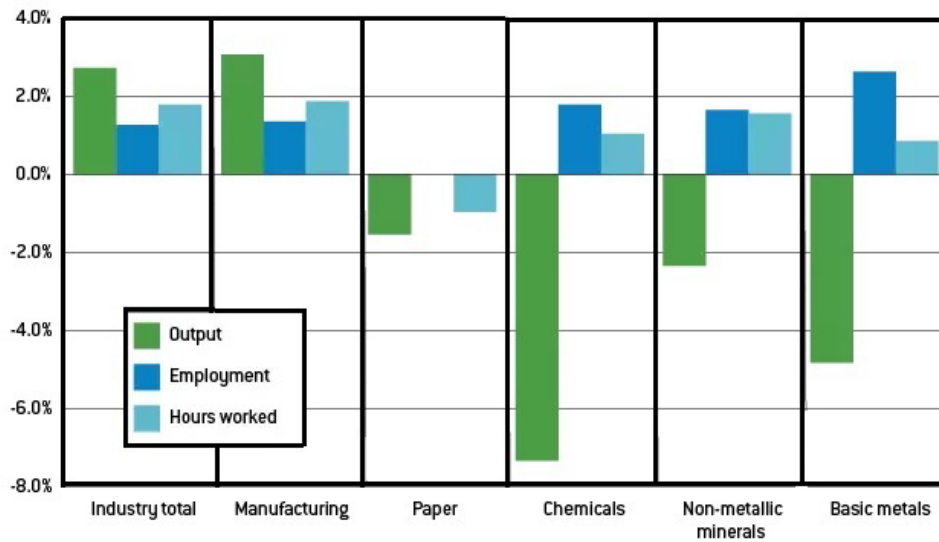
Even if the European Union countries manage to avoid major gas supply shortages in the coming winter, their economies will certainly be impacted by high

energy prices. According to Eurostat, the Czech Republic, Slovenia, Poland, Slovakia, Romania, Hungary and Lithuania rank among the top ten most industrialized economies in the European Union. For example, industry accounts for 29% of total gross value added and the same share of employment in the Czech Republic, compared to European Union - wide averages of 20% and 16% respectively. Multiple European economies also lead the European Union in terms of energy intensity, which will likely weigh on company profits and could lead to closures in energy-intensive sectors. For example, high energy prices have already led to a closure of an aluminium production facility employing around 300 full-time employees in Slovakia.

3. THE IMPACT ON EUROPEAN INDUSTRY JOBS

Europe's price crisis started in September 2021, when Russia started to phase down gas flows to European buyers, resulting in 86 billion m³ of forgone supplies, or a 60% reduction in 2022 compared to 2021. In the first year the European Union did not experience the massive job losses that many warned would happen in case of a drastic reduction in natural gas supplies from Russia.

By summer 2022, when energy prices peaked, industrial employment in the European Union had actually increased, both in terms of people employed and hours worked, compared to the same period in 2021. Total manufacturing output was also higher (3 percent year-on-year in the third quarter of 2022 and continuing at the same level in the fourth quarter). However, output decreased in particularly energy-intensive subsectors, with chemicals experiencing the biggest fall (Figure 5).



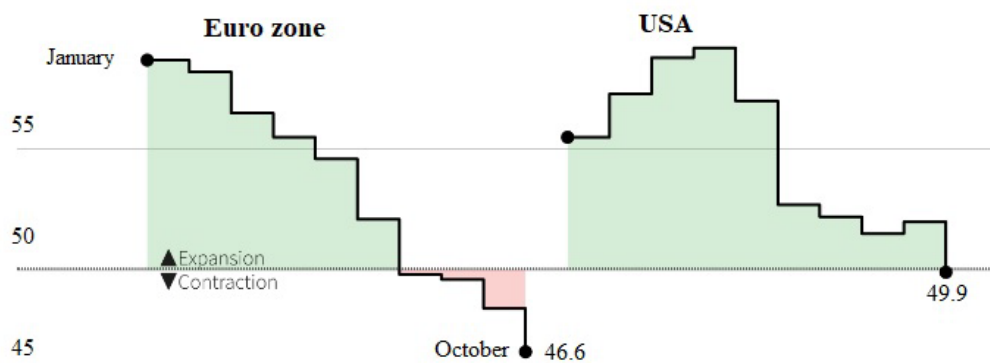
Source: Eurostat

Figure 5. Employment and hours worked in EU industrial sector in 2022 compared to 2021

Estimation shows that 12921 million men and women in the European Union (of whom 10966 million in the euro area) were unemployed in August 2022. Compared

with July 2022, the total number of unemployed decreased by approximately 52,000 in the EU and by 30,000 in the euro area. Compared with August 2021, unemployment decreased by 1682 million in the EU and by 1358 million in the euro area (Sgaravatti, et al., 2023).

With energy bills rising to unaffordable levels, the first 200 Belgian companies have already registered for a temporary unemployment system and more could soon follow. The Belgian scheme would allow for companies to rubber stamp that energy costs allow for more than 3% of the production cost of the process. Statistics from Belgium's national employment office (NVA) show that the companies combine for temporary employment for a total of 10684 employees. That's a rapid rise compared to six days earlier, when the total number was only 1175 employees spread across 44 companies (Bijnens, et al., 2021).



Source: reuteurs.com

Figure 6. Manufacturing slowdown - comparison between Euro zone countries and USA

Alum Tulcea, a factory in Romania that produces calcined alumina, announced in June the shutdown of production in Tulcea from August 2022, with the loss of 441 out of 700 jobs. Increasing electricity and gas prices have made it cheaper to import alumina than to produce it.

This was followed in July by an announcement from Slovalco, the only aluminium producer in Slovakia, that it would dismiss 300 of its 450 employees based in Žiar and Hronom, due to rising electricity prices, which have made production unprofitable. Subsequently in October, the company announced it was delaying the announced layoffs until the end of 2022 to ensure the safe decommissioning of furnaces and cleaning of the premises.

The Dutch aluminium producer Aldel plans to let go nearly all of its 200 employees in its Delfzijl plant, near Groningen, by the end of the year. The company said that it was operating a controlled shutdown, retaining only 13 employees. It indicated its intention to restart usual production in the future, but it would need either substantial support from the government or substantial declines in gas prices to do so. Since October 2021, the company has produced only one-third of what it would have usually produced.

In Finland, the steel and chrome manufacturer Outokumpu announced in October the dismissal of 14% of its workforce working in its ferrochrome operations, because high energy prices prevented the company from restarting one of its three ferrochrome furnaces after a maintenance break.

The energy crisis is also hitting hard plastic, rubber and other non-metallic mineral products manufacturing. In Belgium, the rubber producer Arlanxeo in June announced plans to make 70 of its 345 employees at Zwijndrecht, near Antwerp, redundant.

In Czech Republic, the plastics company Plastic Parts & Technology, after two years of financial instability, went bankrupt in September, again mainly due to the dramatic increase in energy prices. All of its 110 employees are to lose their jobs. In Poland, the ceramic tiles manufacturer Cerrad announced that it would dismiss around 350 employees because it had to shut down three out of seven production lines. Management reported energy cost rises of 1,500% since January 2021.

Another ceramic tiles producer, the Spanish company Halcón, announced in October a redundancy plan for 185 permanent employees in the province of Castellón; 550 temporary positions will also be cut.

For those sectors that are nonetheless suffering, European Union and national policymakers have responded to the energy crisis with packages to compensate households and businesses for increasing energy costs. One potential source of relief is the agreement reached by the European Council in October 2022 on containing energy prices in the European Union (Zettelmeyer, et al., 2022).

4. CONCLUSIONS

The energy crisis produced by the war in Ukraine is particularly affecting industry in Europe. As part of its strategy to minimise the impact of the surge in energy prices over the past year and to decouple the continent from Russian gas supplies, the European Union put forward a plan to cut gas usage by at least 15%, which was in force from August 2022 until 31 March 2024.

The sectors hardest hits are those that are more energy-intensive: paper, chemicals, base metals and non-metallic minerals (including cement and concrete), which account for 65% of the total gas demand and 54% of the electricity consumed by all of industry in the EU. Moreover, Germany and Italy were the economies most exposed to Russian gas (in 2021, Russian gas accounted for more than 60% and 40% of their total gas imports, respectively), and this explains why their energy-intensive sectors have suffered more than the euro area average.

The inter-related energy and cost of living crises have dominated the CEE political agenda and exacerbated underlying political rivalries, prompting a government collapse in Bulgaria, a vote of no confidence in Petr Fiala's government in the Czech Republic, and the emergence of a minority government in Slovakia. In other countries, the governing parties are scrambling to address mounting pressures on households and businesses without destabilizing public finances and investor confidence. The extent to which the governments across the region are effective in shielding vulnerable

households and sustaining business activity will be an important factor shaping political trends in the region.

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