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Energy prices, Competitiveness, and Austria's exports

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In 2021 and particularly in 2022, gas prices rose sharply in Europe due to Russia's invasion of Ukraine and the previous throttling of Russian gas supply to Western Europe. Because of the merit-order system, this also led to an increase in electricity prices in Austria and in many other EU countries. Since Russian pipeline gas must be replaced by more expensive liquefied natural gas and by more volatile electricity from renewables, energy prices in Europe will also in the future remain higher than before 2021 and higher than in other regions, particularly in the US and in Asia. In Austria companies and households are also confronted with rising fees for the gas and the electricity grids. The higher energy costs undermine Austria's international competitiveness. Simulations with a panel econometric model in this Policy Brief underline that exports of the Austrian manufacturing industries are negatively affected by higher energy prices. Economic policy should support structural change towards new industries. Permanent subsidies are, however, not an economically sustainable option.

1. Introduction

Since Russia's invasion of Ukraine in 2022, the EU in general and Austria in particular have been confronted with higher energy prices. Cheap pipeline gas from Russia had to be replaced by more expensive liquefied natural gas (LNG). Due to the electricity market design with the merit-order model, in which the marginal costs of the most expensive power station determine the electricity price, these high gas prices also raised electricity prices. In addition, due to greenhouse gas emission reduction targets, for electricity generation fossil fuels have increasingly been replaced by renewables, which are more volatile. Furthermore, the prices that companies and households must pay for energy do not only consist of the costs of energy but also include taxes and fees. The increased use of renewables requires an expansion of the transmission grid. In Austria, the costs of investment in the transmission grid are passed on to companies and households via grid fees. Gas prices also consist of the energy price, grid fees, and taxes. Here, the substitution of renewables for pipeline gas leads to the situation that the more or less fixed costs of operating the gas grid have to be borne by decreasing gas volumes; hence, the grid fee per kWh rises. This is the main reason for gas grid fees to increase by around 18% on average in Austria as of January 2026. According to these developments – replacement of pipeline gas by LNG and by renewable sources as well as increasing grid fees – energy prices are and will be higher in Austria and more generally in Europe than they were before 2022, and they will remain higher than in other regions of the world, such as the US. Therefore, this policy brief analyses the energy intensity of Austria's exports and the impact of energy costs on exports. An earlier analysis in Reiter et al. (2024) has shown that, compared to Austria, European competitors have been less affected by the natural gas price increases since 2022, with the exceptions of Hungary, Italy, and Spain. Recent developments in electricity prices are heterogeneous. Some countries have been confronted with higher electricity prices, while others have experienced lower prices than in Austria. The analysis in Reiter et al. (2024) shows that most European competitors face similar challenges as Austria due to higher energy prices. Austria's export industry turns out to be more energy-efficient than its competitors in most of the analyzed sectors. However, this could also be partly due to a different sector structure or the product structure of exports and therefore cannot be clearly interpreted as a more energy-efficient production. Since data on energy use are only available at the industry level, not at the product level, a more precise distinction cannot be made. In the following sections, we will first present some descriptive statistics on energy prices and the energy intensity of Austria's exports. Then, as in Astrov et al. (2015) and in Weyerstraß et al. (2024), we show the results of econometric models of exports, depending on energy and other input costs.

2. Energy prices, energy intensity and exports in manufacturing

Figure 1 shows the development of natural gas prices for companies in Austria in comparison to the largest EU economies as well as the US and Asia between 2010 and 2024. The most important competitor in Asia is China, but for China no price data is publicly available. Hence, the price development in South Korea and Japan is shown as representative of the East Asian region.

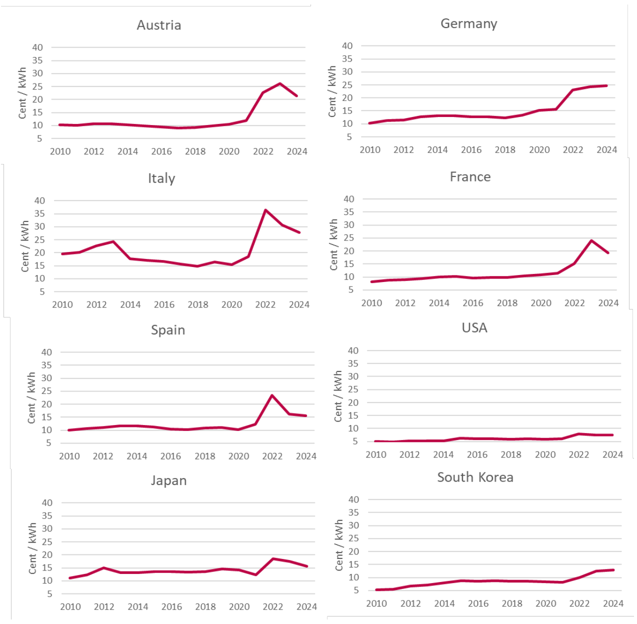
Figure 1: Gas price developments for companies

Source: Own illustration, Department for Energy Security and Net Zero (2025), where data are taken from the International Energy Agency (IEA), and the US Energy Administration (EIA). Prices include taxes. No data are available for Japan for 2024.

In all countries considered, gas prices were broadly stable between 2010 and 2020. In South Korea and Japan, natural gas prices were slightly above European prices between 2011 and 2014 at 5 cents per kWh but then fell in the second half of the decade to a similar level as Europe. At around 1 cent per kWh, the US had significantly lower gas prices than all other countries considered during the period under review. The rise in energy prices that began in 2021/2022 also led to only a slight increase in the price in the US, to 2.6 cents per kWh. In Europe, there was a sharp increase during these years. In Austria, the price rose to an average of 10.5 cents per kWh. Similarly to the US, in Asia the price rise was much less pronounced than in Europe, with a maximum of around 7.6 cents per kWh in South Korea and 6.4 cents in Japan. After 2022, the natural gas price decreased quickly, but in Europe it remained significantly higher than prior to 2021 and higher than in the USA and in Asia. Particularly vis-à-vis the US, the price differential has thus markedly widened since 2021.

Figure 2 shows the development of electricity prices for companies in the selected countries between 2010 and 2024. Austria had a stable electricity price of around 10 cents per kWh between 2010 and 2021. In 2022 and 2023, there was a sharp increase to 26.2 cents.

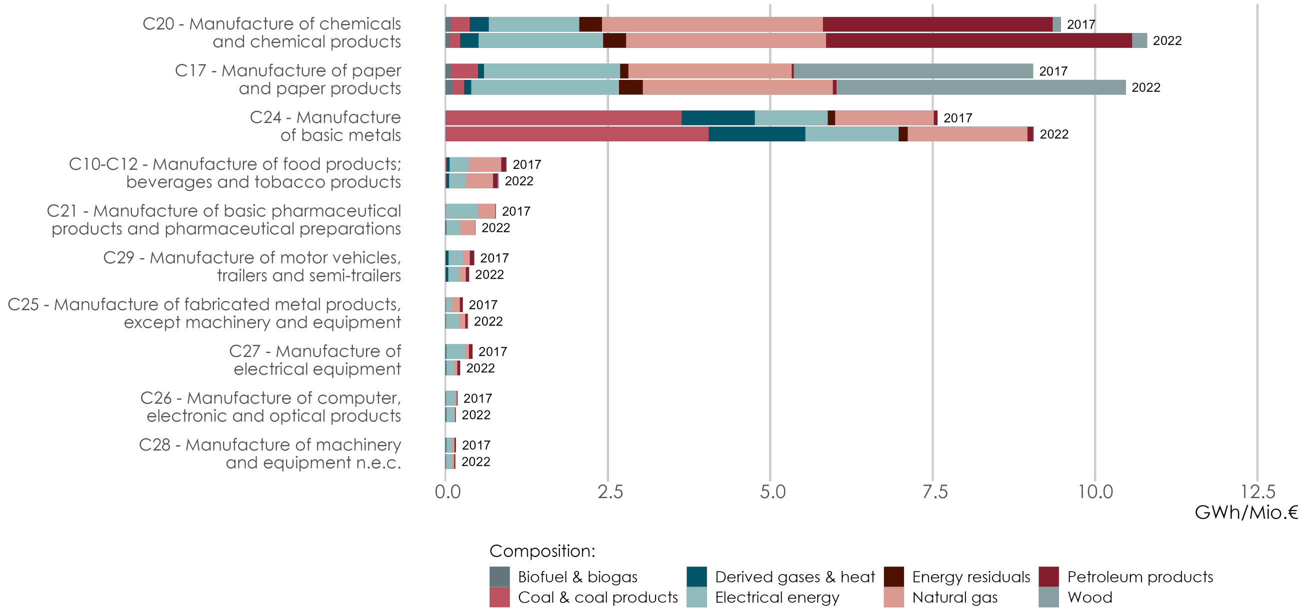
Figure 2: Electricity price developments for companies



Source: Own illustration, Department for Energy Security and Net Zero (2025), where data are taken from the International Energy Agency (IEA), and the US Energy Administration (EIA). Prices include taxes.

Throughout the entire period, electricity prices in Germany were around 2 to 3 cents per kWh higher than in Austria. The electricity price in Germany peaked at around 25 cents per kWh in 2024. In contrast to the other European countries, in Germany the electricity price rose further in 2024. France and Spain had similar electricity prices to Austria, although there was a slight upward trend in France. There, the price hike during the energy price crisis occurred somewhat later than in Austria and Germany. In France, the electricity price only rose to a small extent in 2022, but the peak in 2023 was comparable to that in Austria. Japan also experienced a significant increase in its electricity price to around 18.6 cents per kWh in 2022. In South Korea, electricity prices were relatively low during the period under review, but they increased more or less steadily from around 5.2 cents per kWh in 2010 to 13 cents in 2023. Electricity prices remained stable and low at around 6 cents per kWh in the US until 2021 and only rose to about 8 cents in 2022. Similarly to gas prices, despite their decline in 2024, electricity prices in Europe remain considerably higher than before 2022 and higher than in Asia or in the US.

Figure 3: Energy intensity of Austrian manufacturing industries by energy carrier



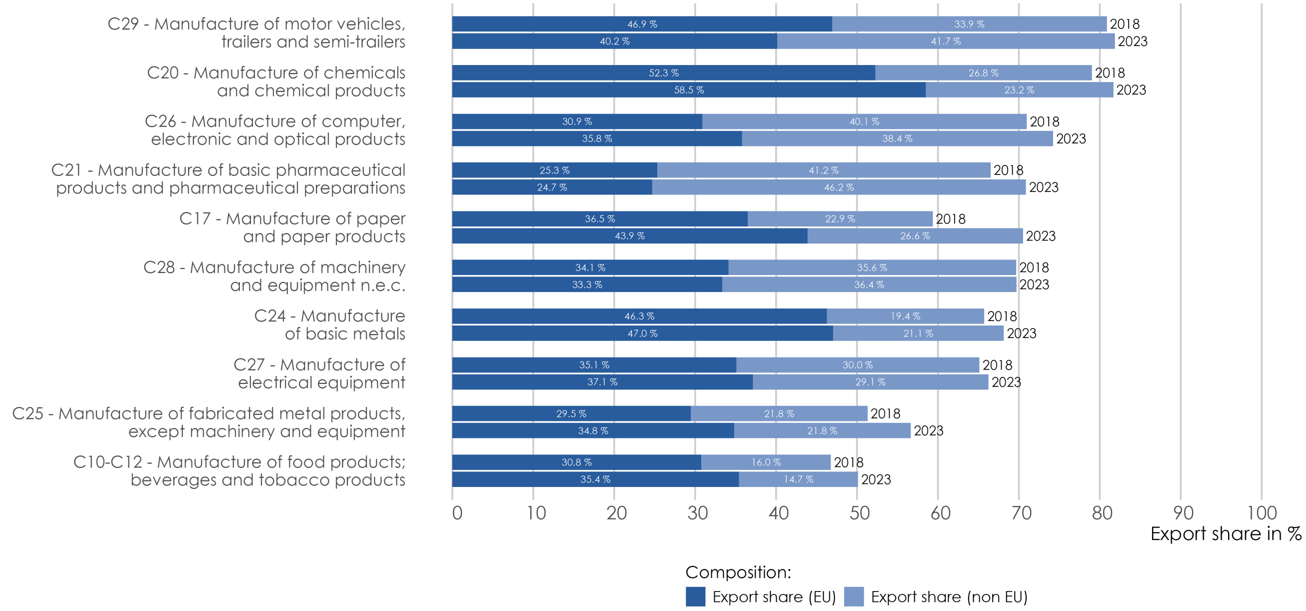
Source: Own calculations and illustration on the basis of data from Eurostat (2025a, 2025b)

The sharp increase in energy prices in Europe undermined the international price competitiveness of its companies. This loss of competitiveness was, to a varying degree, amplified by increasing wages. In Austria, the link between changes in wages and in consumer prices is particularly tight.

The extent to which the Austrian industry is affected by the rise in energy prices depends on the energy intensity of production, the export intensity and the target countries or regions of exports. As figures 1 and 2 have shown, the energy price increase was comparable in the EU countries but much less pronounced outside Europe. Hence, the more Austria exports – directly or indirectly via global supply chains – to countries outside the EU, the more problematic the European energy price increases are. Moreover, industries with a high energy intensity are also more heavily affected than less energy-intensive industries.

Figure 3 depicts the energy intensity of the ten most energy-intensive sectors of the Austrian manufacturing industry. Following Germeshausen and Löschel (2015), the energy intensity has been calculated as the sector's physical energy consumption in GWh in relation to the real gross value added of the respective sector in millions of euros. The calculation was based on Eurostat's physical energy flow accounts (2025a) and the FIGARO supply, use and input-output tables, also published by Eurostat (Eurostat, 2025b). Only the end use of energy was taken into account as the energy consumption of a sector, i.e., the final stage of energy conversion. In contrast, energy conversion use, i.e., the energy sources that are transformed into other energy sources, was not included. An example is the crude oil used to produce diesel: the petroleum used to produce diesel is not included in the end use of the mineral oil processing industry as a conversion input, while the energy required for the conversion appears in the end use in this case. The definition of end use also includes non-energy use, e.g., naphtha or crude oil, which are processed into plastics in the chemical industry. In accordance with the energy flow accounts, eight categories of energy sources (derived gases & heat, biofuels, firewood, electricity, natural gas, coal & coal products, petroleum products, and various wastes) were distinguished. Despite its very high energy intensity, the industrial sector C19 (coking and mineral oil processing) was not included in the presentation, since energy sources in this sector are primarily traded commodities. From Figure 3 it can be seen that three sectors stand out with considerably higher energy intensities than all other sectors: C20 (manufacture of chemicals and chemical products), C17 (manufacture of paper and paper products), and C24 (manufacture of basic metals). In sector C20, mineral oil products account for the largest share of energy consumption. In sector C17, firewood and natural gas are the main sources of energy, while in sector C24, coal, coal products and process-related derived gases and heat are the primary sources.

Figure 4: Export shares of Austrian manufacturing industries



Source: Own illustration on the basis of the FIGARO tables (Eurostat, 2025a)

The increase in energy intensity between 2017 and 2022 (the latest year for which data for all variables necessary for the calculation of the energy intensity was available) does not necessarily mean that physical energy input has risen. In the formula for calculating energy intensities, the denominator is real value added (GVA). If real GVA increases less than the energy input, or if real GVA even decreases, e.g., due to the input price shock, this leads to a decrease in the relation between energy consumption and real value added.

As mentioned earlier, the energy price hike hits those sectors the most which have the largest energy intensity and which export a large share of their products, in particular if exports are directed towards countries with lower energy prices. Thus, Figure 4 depicts export shares of the ten most export-intensive sectors of the Austrian manufacturing industry.

Sector C29 (manufacture of motor vehicles) has the highest export share. About 82% of this sector's production is exported, with around 42% going to countries outside the EU. Of the particularly energy-intensive sectors, C20 (manufacture of chemical products) has the highest export share also at around 82%. 23% of this sector's production is exported to non-EU countries. Another energy-intensive sector, C17 (manufacture of paper and paper products), has an export share of 70.5%. This sector supplies 26.6% of its production to non-EU countries. At 68%, sector C24 (manufacture of basic metals) has a slightly smaller export share, with 21% of its production being exported to countries outside the European Union.

3. Energy prices and competitiveness - literature review

Reiter et al. (2024) provide a comprehensive literature review on the macroeconomic impacts of energy price increases. In the literature, energy price shocks are often examined in the form of exogenous price increases for imported fossil fuels, particularly crude oil. From the supply side, an important aspect is that energy is an input used in the production of goods. An increase in international energy prices therefore worsens the terms of trade, but the main effect lies in the impact on the production decisions of companies. Changes in energy price therefore affect domestic production and competitiveness via the cost channel. A problem that has been recognised in the literature is that, under standard assumptions, the impact of energy price changes on GDP is limited by the low share of energy costs in domestic production (see, for example, Rotemberg and Woodford, 1996). An obvious way to increase the influence of energy prices on production is to assume that energy is not easily substitutable for other intermediate goods or production factors. However, other mechanisms that can amplify the supply effect of energy price shocks are also discussed in the literature. Firstly, it is conceivable that companies can increase their price mark-ups in the short term following energy price increases (Rotemberg and Woodford, 1996). Secondly, physical capital (e.g., machinery) generally requires energy to operate. Higher energy prices are therefore likely to have a negative impact on capital utilisation (Finn, 2000). Thirdly, the capital currently in use is likely to be highly complementary to current energy use. Reducing energy consumption while maintaining production levels is not feasible in the short term but requires long-term investment, in particular to replace current capital with energy-saving capital or capital based on other forms of energy (Atkeson and Kehoe, 1999). Fourthly, energy price increases can reduce profit expectations and thus the expected profitability of new companies, thereby preventing them from entering the market (Patra, 2020). Fifthly, energy prices are also likely to influence companies' business location decisions. In addition to supply effects, energy price changes also have demand effects. Expected lifetime income might decrease, either because energy prices rise permanently or because the increase in energy prices has a negative impact on GDP growth. Binder and Makridis (2022) show empirically for the United States that consumer sentiment becomes more pessimistic as petrol prices rise. But even regardless of the expectation effect, higher energy prices reduce consumers' disposable income, as they have less money available after paying their energy bills. In particular, credit-constrained households have to cut back on their consumption when energy prices rise. Kilian (2008) mentions three more mechanisms through which energy price changes can affect aggregate demand. Firstly, consumers may increase their precautionary savings, since current changes in energy prices increase uncertainty about future energy price developments. Secondly, the latter can also lead to the postponement of purchases of durable consumer goods. Thirdly, households may postpone or refrain from buying goods that require substantial energy use.

Reiter et al. (2024) use a dynamic stochastic general equilibrium (DSGE) model of the Austrian economy to estimate the impacts of different scenarios of higher energy prices and CO_2 emissions prices, respectively, on the Austrian economy. The results of their model simulation can be summarised as follows. A doubling of natural gas prices compared to the 2019 annual average will only have a significant impact on the overall economy if the price of electricity remains linked to the price of gas, which is the case as long as gas is the marginal source of electricity generation. In this case, energy-intensive and export-oriented manufacturing industries are most affected, especially chemicals, paper, metals and glass. If the increase in gas and electricity prices affects the whole of Europe, losses in value added in these industries are estimated to be in the range of 1.5 to 4%. Once gas is replaced as a marginal source of electricity by alternative energy sources, only the chemical industry will be significantly affected, with a decline in value added of 1.7%. The introduction of CO_2 pricing by Europe alone, at around 400 euros per tonne of CO_2 as currently planned for the years from 2035 onwards, would have a much greater impact. Due to the increase in the price of all fossil fuels, which in percentage terms particularly affects coal, the metal industry would be even more heavily burdened than the chemical industry in this scenario. A decline in value added of over 20% is estimated in the analysis of Reiter et al. (2024) for both sectors if the gas price continues to be linked to the electricity price. The decline in Austria's GDP is estimated at around 3%.

4. Energy prices and exports: empirical investigation

4.1 Modelling approach

In our empirical analysis, we investigate the influence of energy prices on Austria’s exports. In its main features, the analysis is based on Astrov et al. (2015). This study measures the effects of changes in energy intensity and energy cost shares on the competitiveness of industry by estimating a panel data model for the period 1995 to 2007. In this model, exports (within and outside the EU) are used as the dependent variable. Methodologically, the model is estimated in first differences with fixed effects for countries and industries to consider unobserved heterogeneity between countries and industries and thus explain the export dynamics of each industry in each country over time. In addition to the main variables (i.e., energy intensity and energy cost shares), the model includes several control variables that are commonly used to explain the export performance of a country or industry, such as labour productivity, the share of highly and medium-skilled workers, capital intensity, wages and the size of the economy.

Table 1: Sectors included in the econometric estimations

NACE	Definition
C10-12	Manufacture of food, beverages, tobacco
C13-15	Manuf. of textiles, clothing, leather
C16	Manuf. of wood and wood products
C17	Manuf. of paper and paper products
C18	Printing and reproduction of recorded media
C20	Manuf. of chemicals and chemical products
C21	Manuf. of basic pharmaceutical products
C22	Manuf. of rubber and plastic products
C23	Manuf. of other non-metallic mineral products
C24	Manuf. of basic metals
C25	Manuf. of fabricated metal products, exc. machinery
C26	Manuf. of computer, electronic and optical products
C27	Manuf. of electrical equipment
C28	Manuf. of machinery and equipment n.e.c.
C29	Manuf. of motor vehicles, trailers and semi-trailers
C30	Manuf. of other transport equipment
C31-32	Manuf. of furniture and other products

Source: FIGARO tables (Eurostat, 2025a)

We use a panel econometric model to explain exports of each manufacturing sector by unit energy costs and by unit labour costs. We also tried to include an index of world trade as a demand variable, but in this case, for many sectors, unit energy costs became insignificant or had a positive sign. Since for this policy brief, we are especially interested in the influence of energy costs on exports, our main focus was to find equations with a significant relationship between energy costs and exports and included other explanatory variables as long as the first condition was fulfilled. The models were estimated for the sectors listed in Table 1. We estimated panel models including Austria, the largest EU economies and the most important economies outside the EU. Hence, the following countries were included: Austria, Germany, Italy, France, Spain, the USA, and China.

In accordance with the classification of economic activities in the FIGARO tables, exports from the manufacturing sectors listed in Table 1 were modelled for this report. The NACE codes are given in the first column. NACE (Nomenclature statistique des activités économiques dans la Communauté européenne – Nomenclature of Economic Activities) is the European statistical classification of economic activities.

For each of the manufacturing sectors, we estimate the following model:

$$\log(X_{A,i,t}) = c_i + \alpha_{1,i}\log\left(UEC_{A,i,t}\right) + \alpha_{2,i}\log\left(ULC_{A,i,t}\right) + \alpha_{3,i}D2022 + \alpha_{4,i}D2023 + \varepsilon_{i,t}$$

The following variables have been included:

- log: natural logarithm
- X_{Ait}: exports of good I from country A in period t
- $UEC_{Ai,t}$: unit energy cost for producing good I in country A in period t
- $ULC_{Ai,t}$: unit labour cost for producing good I in country A in period t
- D2022: dummy, 1 in 2022, 0 otherwise
- D2023: dummy, 1 in 2023, 0 otherwise
- c_i: constant
- ε_i: error term
- a_i: parameters

The dependent variable is the logarithm of exports of good or sector i from country A. Panel econometric methods are used to estimate the constant c and the parameters ai. In a panel model, the cross-sectional dimension and the temporal dimension are linked. The cross-sectional dimension here comprises the seven countries mentioned above, while the temporal dimension covers the years 2010 to 2023.

The most important determinant of exports for our analysis is the logarithm of unit energy cost (UEC). The unit energy cost is calculated by dividing the cost of energy purchased by the gross value added of the respective sector. Energy costs are calculated from the intermediate inputs purchased from the energy supply sector and from the coking and mineral oil processing sector, as suggested by Germeshausen and Löschel (2015). Energy costs do not include energy sources such as coal or firewood, as these are only recorded in the data sources used in aggregate with non-energy intermediate inputs and therefore cannot be distinguished from them. Own energy production is also not included, as it is not recorded as an intermediate input. In addition to unit energy cost, in the estimations (the logarithm of) unit labour cost is included as the second main determinant of exports. However, the latter proved significant only in some sectors, while we chose the model in such a way that energy costs appear in each sector. Due to the exceptional increase in energy costs in the years 2022 and 2023, dummy variables for one or both of these two years also had to be included in some equations.

We apply an approach like Weyerstraß et al. (2024). There, an index of world trade was included in addition to the cost variables, since exports should in theory be driven by foreign demand and by relative costs. Here, we did not find equations for each sector in which both foreign demand and energy costs appeared significantly with the expected sign. While this was the case in Weyerstraß et al. (2024), there the drawback was that only the sum of energy, labour, and other input costs could be included in the models, implying that all these costs exert the same influence on exports. In our analysis presented here, the advantage is that we can isolate the influence of energy costs on exports, but this comes at the cost of being able to have models with only energy and, in some cases, labour costs, but no foreign activity variable included.

4.2 Data sources

The data for exports and the data necessary to calculate energy and unit labour costs are taken from Eurostat's FIGARO tables. The FIGARO tables ('Full international and global accounts for research in input-output analysis') are cross-country supply, use and input-output tables. They reflect global economic interdependencies and are based on official EU data with supplementary information on the most important non-EU trading partners (Eurostat, 2025a). The country coverage includes the 27 EU Member States, 18 major EU trading partners and the 'Rest of the World' region. The FIGARO tables currently contain time series for the period 2010 to 2023. The energy intensities necessary for calculating unit energy costs were calculated on the basis of Eurostat's physical energy flow account (2025b) and national accounts aggregates by economic sector from the Eurostat database. While export data are already available for 2024, in the panel model only data until 2023 were included since all data were taken from the FIGARO tables, which are only available up to 2023.

4.3 Estimation results

The estimation results can be found in Table 2. The first column contains the NACE code of the respective sector (see Table 1 for the exact names of the sectors). The constants can be found in the second column. The most important results for our analysis are shown in the third column, namely the impact of unit energy costs on sectoral exports. The influence of unit labour costs is depicted in the fourth column, and as mentioned, in some sectors dummies for the years 2022 and/or 2023 were significant. For these cases, the coefficients can be found in the last two columns. Since the model was estimated in logarithms, the coefficients of unit energy and unit labour costs are elasticities. They show by how much exports of the respective sectors decline if unit energy costs or unit labour costs rise by 1%.

The coefficients show the average relations between the dependent variable and the explanatory variables over the panel of seven countries and 14 years. The country-specific reactions of exports to changes in the independent variables can be determined via model simulations, taking the country-specific fixed effects into account. The largest elasticity of -0.309 is found for sector C29 (manufacture of motor vehicles, trailers and semi-trailers), followed by sectors C25 (manufacture of fabricated metal products) with an elasticity of -0.221 and C21 (manufacture of pharmaceutical products) with an elasticity of -0.205. Hence, if unit energy costs rise by 1%, exports in these sectors decline by an average of 0.31% (C29), 0.22% (C25), and 0.21% (C21), respectively, over the panel of seven countries. The three sectors with the highest energy intensity have below-average elasticities of their exports with respect to unit energy costs. In sector C20 (manufacture of chemicals and chemical products), exports decline by 0.07% if unit energy costs rise by 1%. In sectors C17 (manufacture of paper and paper products) and C24 (manufacture of basic metals), the elasticities are -0.09 and -0.03, respectively. It seems surprising that the sectors with the highest energy intensities are among those with the lowest reaction of exports to changes in unit energy costs. The reason might be that due to the high reliance on energy inputs, the companies have learnt to cope with the energy costs.

However, inspecting the production of the energy-intensive industries in relation to the entire manufacturing sector in Austria shows that indeed in recent years the energy-intensive industries have reduced their production (Figure 5). As in Vogel et al. (2023) for Germany, the production index of the energy-intensive industry in Austria was constructed with seasonally adjusted data of the production index for the five most energy-intensive manufacturing sectors, taking the value added of the year 2015 as weights.

Table 2: Panel estimation results

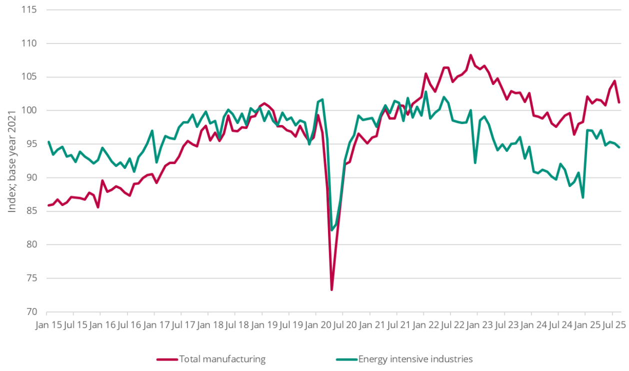
Sector	Constant	Log (Unit energy costs)	Log (Unit labour costs)	D2022	D2023
C10-C12	9.608	-0.110	-0.754	0.253	
	0.088***	0.027***	0.112***	0.083***	
C13-C15	9.116	-0.124	-0.396	0.214	0.193
	0.156***	0.046***	0.257	0.043***	0.042
C16s	7.874	-0.083	-0.333	0.389	0.371
	0.03***	0.013***	0.043***	0.039***	0.04***
C17	8.828	-0.090		0.372	0.356
	0.033***	0.018***		0.036***	0.036***
C18	4.862	-0.151	-2.057	0.246	0.230
	0.149***	0.042***	0.281***	0.056***	0.055***
C20	10.471	-0.071		0.381	0.400
	0.021***	0.017***		0.046***	0.048***
C21	8.769	-0.205		0.377	0.401
	0.09***	0.026***		0.057***	0.056***
C22s	9.177	-0.169		0.420	0.351
	0.039***	0.016***		0.028***	0.027***
C23	8.461	-0.099	-0.718	0.262	0.266
	0.04***	0.016***	0.048***	0.03***	0.031***
C24	10.125	-0.030		0.317	
	0.021***	0.009***		0.073***	
C25	8.964	-0.221	-0.429	0.292	0.331
	0.092***	0.025***	0.126***	0.039***	0.039***
C26	9.395	-0.087	-0.617	0.267	0.223
	0.076***	0.013***	0.09***	0.037***	0.039***
C27	9.684	-0.129		0.286	0.304
	0.107***	0.033***		0.037***	0.037***
C28	10.345	-0.124		0.281	0.299
	0.045***	0.013***		0.026***	0.026***
C29	9.706	-0.309	-0.174	0.240	0.225
	0.039***	0.01***	0.038***	0.033***	0.032***
C30	9.641	-0.072		0.298	0.236
	0.082***	0.021***		0.04***	0.04***
C31-C32	9.073	-0.121	-0.271	0.184	
	0.059***	0.009***	0.089***	0.064***	

Standard errors are shown below the coefficients. ***: significance at the 1% level.

Fixed country effects included. Estimation period: 2010 – 2023

Source: own estimations

Figure 5: Production of energy-intensive industries in Austria



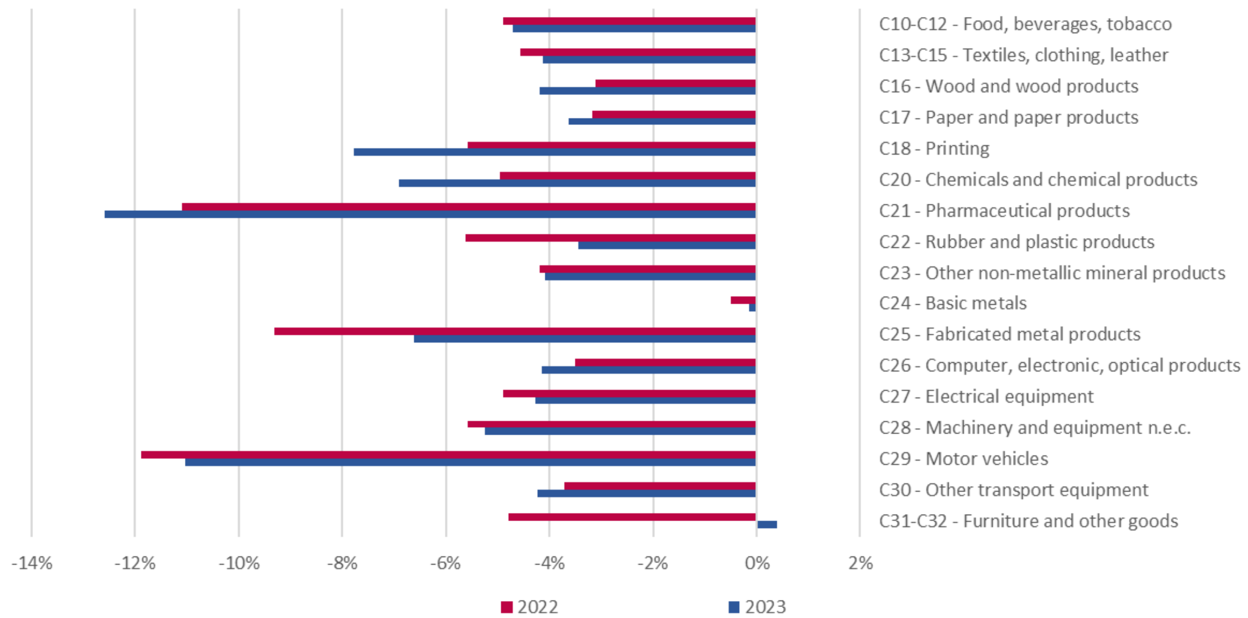
Source: own calculations and illustration based on data from Statistics Austria

As discussed in detail in Weyerstraß et al. (2024), the massive rise in energy prices in 2022 and 2023 led to a decline in production in Austria's energy-intensive industries, but this decline was significantly less pronounced than in Germany. Since the beginning of 2024, there has been a recovery in both the industry as a whole and in energy-intensive industries. On the one hand, this is likely to be related to the global economic recovery. On the other hand, energy prices have stabilised, and the adjustment of production to the current global energy price ratios is likely to have been largely completed. As discussed for Germany in Projektgruppe Gemeinschaftsdiagnose (2023), some energy-intensive manufacturing companies, particularly in the chemical industry, have responded to the energy-price hike in 2022 by relocating particularly energy-intensive production lines abroad, while company headquarters and research and development have largely remained in Germany. This also explains why gross value added in energy-intensive manufacturing sectors has performed better than industrial production. This could be a sign of successful structural change, as economic success is measured by value added rather than production figures.

4.4 Counter-factual simulations

Using the panel model, we run a simulation, holding Austria's unit energy costs in the years 2022 and 2023 constant at their 2021 levels. For unit labour costs, we use the actual values for the years 2022 and 2023. Figure 6 shows the impacts of the rise in unit energy costs on Austria's manufacturing exports according to the panel model. The figure shows the percentage deviation of exports as compared to a hypothetical situation in which the unit energy costs had not changed. On the one hand, the results show the upper band of the decline in exports since for unit energy costs in the other countries of the model, the actual values were taken in the simulation. Hence, in reality the European competitors were also confronted with rising energy costs. On the other hand, the reduction in Austria's exports might be understated by the simulations since in Austria labour costs rose more than in other countries, which was not considered in the simulations.

Figure 6: Reduction of Austria exports in model simulations



Percentage deviations of Austria's exports in model simulations in which unit energy costs are held constant at their 2021 levels.

Source: own simulations and illustration

The reaction of exports in the pharmaceutical industry and in the motor vehicles industry stands out. These industries are not exceptionally energy-intensive, but they exhibit relatively high elasticities of exports with respect to unit energy costs. On the other side of the spectrum is the basic metals industry, which shows almost no reduction of its exports, and the furniture and other goods industry, in which unit energy costs in 2023 were even lower than in 2021, in our model simulations leading to an increase in exports in 2023. Here it should be recalled that unit energy costs were calculated as the costs of energy input divided by real value added. Hence, unit energy costs are driven by the costs of energy input, by nominal value added, and by the value-added deflator of each sector.

5. Conclusions

In the context of Russia's invasion of Ukraine in February 2022 – and already in 2021 when Russia reduced its gas supplies to Western Europe – gas prices rose sharply in Europe. Since electricity prices are closely linked to gas prices due to the electricity market design, electricity prices also increased. In Austria, more than in other countries, this was followed by a significant increase in wage costs. These events resulted in a loss of competitiveness of Austrian companies. Energy prices in Europe will probably remain higher than before 2021 and higher than in other regions, particularly the US and Asia. In an empirical analysis, we investigated the impact of higher unit energy costs on Austrian exports. We found significant reductions in exports of most sectors as compared to a counter-factual situation in which energy costs would not have increased. Some companies might already have reacted by relocating their most energy-intensive production lines to countries with lower energy prices. However, it should be stressed that many other factors, like the tax and transfer system, the general regulatory framework, the availability of a qualified workforce, tariffs, transport costs, or the integration in global value chains, are also important factors regarding the production location of companies.

The options available to Austrian policymakers for alleviating the burden of high energy costs on companies are limited. While the temporary electricity cost compensation for energy-intensive industries is justified, permanent subsidies are not an economically sustainable solution. A more effective and sustainable way to lower energy costs for industry is to accelerate the expansion of renewable energy sources, including by simplifying approval procedures. Nevertheless, it will be very difficult for energy-intensive industries to remain competitive in the long term. Therefore, some degree of structural change in the industrial sector will be unavoidable. Supporting this structural transformation by removing barriers to the creation and scaling of new enterprises and by improving access to venture capital is crucial.

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