



Council of the
European Union

**Brussels, 27 October 2022
(OR. en)**

13726/22

**COMPET 809
MI 758
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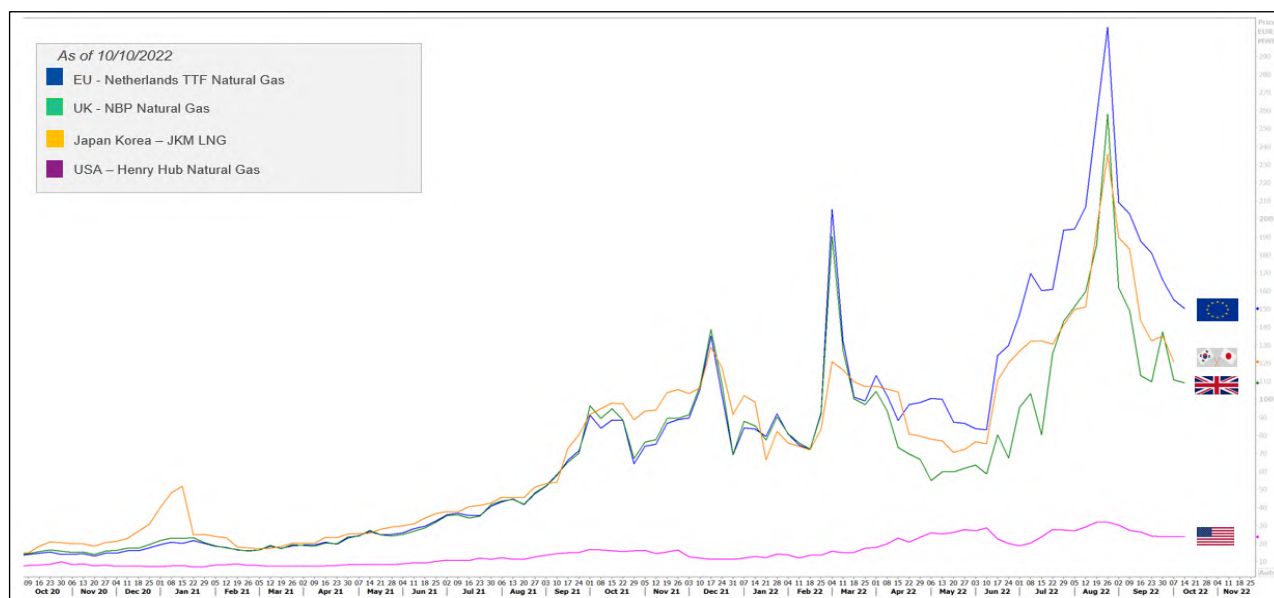
From: Trio Presidency
To: Working Party on Competitiveness and Growth (High Level)
Subject: Background paper: The energy crisis and the competitiveness of EU industry

Delegations will find in Annex a Trio Presidency background paper with input from the Commission on the energy crisis and the competitiveness of EU industry, in view of the discussions at the working lunch of the meeting of the Working Party on Competitiveness and Growth (High Level) on 9 November 2022.

1. CONTEXT

The Russian invasion of Ukraine has gravely exacerbated an already existing fragile situation on international energy markets due to increased global demand in the wake of the Covid pandemic. The high dependency of the EU on Russian gas imports coupled with the severe cutback in Russian gas exports have driven European energy prices to unforeseen highs. Natural gas prices in Europe reached 300€/MWh and higher, which is more than 10 times the average price of the last few years, around 250 percent higher compared with the start of the year, and much larger than those in our trade partners, particularly in the United States (see Figure 1). The combination of relatively stable gas imports from Russia and significantly higher prices than in 2021 resulted in a deterioration in the EU trade balance vis-à-vis Russia even before the invasion. However, TTF gas prices (the European benchmark for pipeline gas and LNG) have since fallen to below 100€/MWh, partly due to milder weather, Europe's gas storage reaching nearly full capacity, as a result of EU joint action and active EU policy signals on putting downward pressure on gas prices and reducing Europe's high dependence on Russian natural gas.

Figure 1: Evolution of gas prices in EU and third partners



Source: Chief Economist Team – DG GROW based on Refinitiv

This background paper aims to set the context for the HLG lunch debate on energy issues and stimulate dialogue and exchange of best practices amongst Member States. It does so by first succinctly discussing the impact of the energy crisis on EU businesses, followed by the complex issue of mapping out vulnerable industries and their value chains that are critical to the functioning of European societies, and that need prioritisation in case of gas rationing, power cuts, or support to ensure their operationality and competitiveness. This note ends with types of policy support that various Member States are putting into place to protect their industries and raises the issue of policy coordination that is essential for a fair level playing field and coherent EU internal market.

2. THE IMPACT OF THE ENERGY CRISIS ON EU BUSINESSES

The EU's overall energy intensityⁱ almost doubles that of the US, reflecting differences in structural composition of the economy. In fact, in the EU, the overall energy intensity of the economy is around 4.4%, which is significantly higher than the US (2.5%), but less than China, given their manufacturing-oriented economy (6%).ⁱⁱ

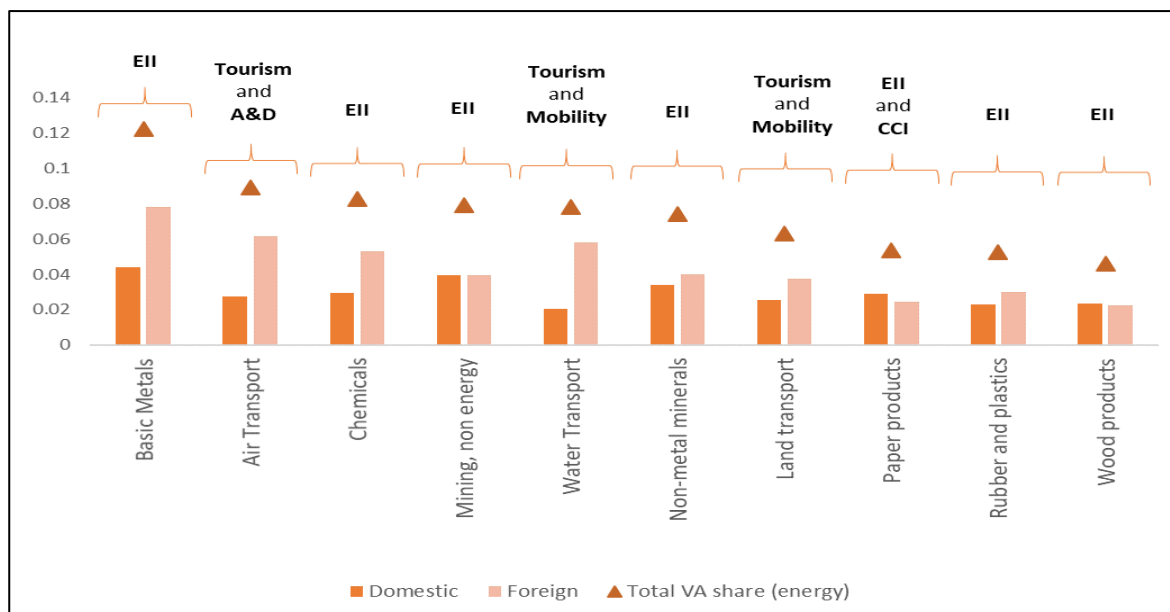
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- ⁱ Energy intensity is defined as the sum of the energy sectors, which includes raw materials (e.g., “energy producing minerals” (D05T06)), intermediates (e.g., mining support activities (D09), coke and petroleum (D19)) and distribution of energy products (e.g. electricity, (D35)), over total production in the economy. This definition is obtained in overall value-added terms, which means that it includes direct exposure to energy and indirect use through intermediate inputs.
- ⁱⁱ Analysis by Chief Economist Team - DG GROW based on World Bank National Accounts Data and OECD National Accounts data. While input-output data is only available in a pre-crisis period in 2018, this analysis allows us to have a better understanding of the national exposure to energy shock. Given the current evolution in energy prices, the overall energy intensity might have increased significantly in the last months.

This structural composition highlights the vulnerability of EU economies with respect to the current negative energy shock, which has a strong sectoral dimension. The heterogeneity in energy intensity across sectors may be analysed by looking at the input-output composition of EU industries. Basic Metals, Air Transport and Chemicals are the most exposed ones and have the highest share of foreign sources compounding their vulnerability (Figure 2). When looking at the energy content of sectors, which shows the share of energy needed to produce the final demand of the sector in question, it is found that, in the case of basic metals, 12 cents of energy inputs are needed to produce 1 euro of final demand, of which 8 cents come from non-EU sources. When the same exercise is carried out for third partners, the EU shows a higher vulnerability of its supply chains to international disruptions in energy products than the US and China.ⁱⁱⁱ Furthermore, the importance of these sectors in terms of value added, investment and employment in the EU economy provides an illustrative picture of their vulnerability in a macro-context. These sectors represent more than 10% for both value added and investment in the EU economy. Out of these sectors we highlight the importance of “Land transport” sector, which accounts for around 3.4% of total economy (excluding agriculture) in terms of value added and 5.2% in terms of total investment. Other important energy intensive sectors in terms of value added are chemicals and rubber and plastic (2.1% and 1.3% respectively). The two most energy intensive sectors (i.e. basic metals and air transport) taken together do not surpass the 1% in terms of employment. With a few exceptions, SMEs have an important role in these high energy intensive sectors.^{iv}

ⁱⁱⁱ Analysis by Chief Economist Team - DG GROW based on OECD TiVA tables (2021 version). 2018 data.

^{iv} Analysis by Chief Economist Team - DG GROW based on *SBS-Eurostat data*

Figure 2: EU top 10 most energy intensive sectors: total, domestic, and foreign content



Source: Chief Economist Team – DG GROW based on OECD TiVA tables (2021 version). 2018 data^v

^v Energy intensity is defined as the sum of the energy sectors, which includes raw materials (e.g., “energy producing minerals” (D05T06)), intermediates (e.g., mining support activities (D09), coke and petroleum (D19)) and distribution of energy products (e.g. electricity, (D35)), over total production in the economy. This definition is obtained in overall value-added terms, which means that it includes direct exposure to energy and indirect use through intermediate inputs. The total content of energy in each sector is decomposed into its domestic and its foreign share. On top, ecosystems each sector belongs to are reported – A&D= Aerospace and Defence; EII= Energy Intensive Industry; CCI= Creative and Cultural Industry.

More specifically, the impact of the dramatic increases in gas and electricity prices have given rise to situations where variable costs exceed revenues for production plants, particularly in energy-intensive industries (EIIs). In such cases, companies may have no choice in the short term but to temporarily suspend or curtail production. For some, especially smaller businesses, this can also lead to outright closures. For example, according to French Economy Minister Bruno Le Maire, the increase in electricity and gas prices would lead to a 10% reduction in industrial production in France in the fourth quarter of 2022. Also, according to the IMF,^{vi} in the short term, the most vulnerable countries to a large-scale and sustained interruption of Russian gas supply to Europe are those in Central and Eastern Europe, which could see a strong negative impact on annual GDP, as much as 4-5 percent compared to the pre-shock baseline. The effect on Austria, Germany and Italy would also be significant. Other countries are unlikely to face widespread gas supply constraints and the impact on GDP would be more moderate (under 1 percent). Preserving a Europe-wide market would reduce the impact for all Member States and encouraging solidarity in the face of shortages would considerably dampen the impacts in worst-hit countries.

As such, more and more EU-based companies are forced to cut down their activities or even completely halt production lines. Furthermore, there is the risk that European energy costs will continue to remain high and damage the EU industrial fabric, unless alternative to Russian natural gas are found, and the EU economy is structurally transformed such that it relies more on lower-cost low-carbon energy sources.^{vii}

^{vi} IMF (2022) “Natural Gas in Europe: The Potential Impact of Disruptions to Supply”
^{vii} For example, Qatar’s energy minister has stated that gas supply problems could last until 2025 if Ukraine war continues and Russian gas does not return, with a tougher challenge coming in winter 2023 as reserves are depleted (as per the article in the Financial Times, 17 October, available [here](#)).

In recent months, reports of closures and layoffs have escalated in number, such as:^{viii}

- Two major aluminium smelters in Romania and Slovakia reduced by 60% and stopped the production of aluminium respectively, each representing the loss of 8-9% of EU annual production. So far, these two companies have announced layoffs of 800 and 300 employees each.
- In the zinc sector, a global multi-metal business has reduced or fully curtailed production in its European production sites (Netherlands, France, and Belgium). This led to the loss of at least 15-20% of European zinc production.
- A major European ceramic tiles producer based in Poland, has stopped 3 out of 7 production lines, leading to 350 layoffs.
- In the severely affected fertilisers sector, Europe's largest fertiliser producer, curtailed its ammonia and urea production by 65% at its European production sites in Belgium, Italy, France, Germany, and the Netherlands.

An integral part of any EII company's business model is to manage energy costs by entering long-term supply contracts and hedging against energy price volatility. However, the current unprecedented turbulence in energy markets prevents such companies to renew their energy long-term contracts and hedging strategies. Moreover, many of these firms had already sought to mitigate higher electricity costs by shifting, where possible, to off-peak production schedules, since the crisis began. Thus, having exploited all such energy cost mitigation strategies, the level of capacity curtailment actions in the EII sectors can be expected to increase significantly in the coming weeks and months until a "new normal" in energy markets allows for long-term or at least 1–2-year contracts and hedging strategies to be renegotiated. In the meantime, it is highly likely that domestic production reduction is replaced by imports coming from third countries, often with a higher carbon footprint.

^{viii} A comprehensive mapping of the situation is not available since companies do not report publicly on such decisions given the impact on their competitive position. Furthermore, such commercially sensitive information would not be shared within trade associations due to competition compliance concerns.

The curtailment of production will typically result in the laying-off of 80-90% of the work force of the affected plants.^{ix} Skilled operators may be kept to maintain the installations and, where necessary, to operate them at idling capacity. The curtailment or temporary suspension of production in view of future reuse, rather than closure, can be viable for a company that has other non-domestic plants, particularly if the time necessary for energy markets to adjust to the new normal (accounting for the end of Russian gas supplies and winter demand) is relatively limited. However, for European companies with single plants or exclusively producing within the EU, the associated costs of a prolonged temporary suspension of production may force them to close and make their workforces redundant.

Question:

1. *Are you collecting information on temporary suspension or curtailment of production or on partial/total shutdowns of industries?*

^{ix} As recent experience with Covid shows, when high numbers of skilled workers are laid-off in a crisis, it takes considerable time, pain, and cost to re-hire and restart facilities. In addition, the work in EIIs is heavy and physically highly demanding, and many unskilled workers if laid off will tend to migrate, if they can, to less onerous (not necessarily better paid) activities.

3. PRIORITISATION CRITERIA FOR SUPPORTING INDUSTRY OR ENSURING ITS OPERATIONALITY

The Commission, in dialogue with industry, adopted a Winter Preparedness package in late July 2022. This put forward a proposal for a Regulation on Coordinated Demand Reduction Measures for Gas, (adopted by the Council on 5th of August) to reduce gas use in Europe by 15% until next spring, and help prepare end-users, including industry for the coming winter. It also adopted a European Gas Demand Reduction Plan (EGDRP) that sets out measures, principles, and approaches for coordinated decreases in its overall gas use. EGDRP is based on the triptych: substitution, solidarity, and sobriety (or orderly savings). Its focus is on keeping European industry operational and competitive by emphasising substitution of natural gas with other fuels and energy savings, with priority given to switching to renewables or cleaner, less carbon-intensive or polluting options.

EGDRP also sets out clear guidance for Member States to help them prepare contingency or emergency plans and prioritise non-protected industrial customers,^x in case of severe gas shortages, based on four types of criteria: **1) societal criticality** (health, food, safety, security, refineries, defence, the provision of environmental services, amongst others); **2) cross-border supply chains** (sectors or industries providing goods and services vital to the smooth functioning of critical EU supply chains); **3) damage to installations** (to account for industries for which production cannot be easily ramped or down without significant delays, repairs, regulatory approval, and costs); and **4) substitution and reduction possibilities** (considering substitution potential of inputs for imports or differentiating between industries that can postpone production or switch off and those that need a continue flow of natural gas).

^x Protected customers, as per the Gas Security of Supply Regulation consist mostly of households, and under certain conditions also essential social services (e.g. hospitals), SMEs, and district heating. Member States can also prioritise critical gas-fired power plants over protected customers. In addition, in the Commission's proposal COM(2022) 549 for a Council Regulation, it is proposed that the non-essential consumption of protected customers may be reduced by Member States, under certain conditions. This does not mean that protected customers are no longer protected against disconnection and the consumption of vulnerable consumers cannot be affected.

The first two criteria are particularly important for mapping out industries and their value chains that are essential for the good functioning of society. Critical industries may be regarded as those providing the vital fabric for the functioning of modern societies, without which our current way of life would not be possible. While it is up to Member States to identify industries that are of societal critical importance, it is essential that there is cooperation and exchange of best practices in this respect, particularly since value chain are cross-border and deeply interconnected and integrated in both the EU internal market but also in global supply chains.

Member States typically have their own process for prioritising gas consumers in case of an emergency or gas supply incident. Box 1 provides an example for the case of Sweden. Nevertheless, when thinking about societal criticality and cross-border supply chains, Member States may also take inspiration from initiatives at various levels that aim at identifying what may be considered as “critical” sectors.^{xi}

^{xi} For instance, at the EU level, there is the “Directive on the resilience of critical entities”, proposed by the Commission in December 2020, and for which a political agreement between the Council presidency and the European Parliament was reached in June 2022. This Directive, amongst others, establishes rules for the identification of critical entities and lays down measures with a view to enhancing their resilience, including those of particular European significance (i.e. if it provides an essential service to six or more Member States). “Critical entities” are defined as those (public or private) entities providing vital or essential services on which the livelihoods of EU citizens and the proper functioning of the internal market depend. A non-exhaustive list of essential services in 11 different sectors are covered: 1) energy; 2) transport; 3) banking; 4) financial market infrastructures; 5) health; 6) drinking water; 7) wastewater; 8) digital infrastructure; 9) public administration; 10) space; and 11) food production, processing, and distribution.

Box 1: Prioritising gas consumers in the case of a gas supply crisis: the case of Sweden

Styrgas is Sweden’s governmental process for prioritizing gas consumers. It is a part of the national crisis preparedness and aims to minimize the impact on society of a gas supply incident.

The competent authority, regional administrations, local councils, and system operators cooperate to prioritize gas customers. The result of this work is the information that is used to establish the system balance administrator’s general disconnection plan and the distribution system operators’ regional disconnection plans. The disconnection plans should be used when carrying out a planned firm load shedding and are also an important source of information when carrying out a manual load shedding. Participants shall observe security of information aspects of this work.

In the Styrgas planning process, gas customers are ranked according to the following order of priority:

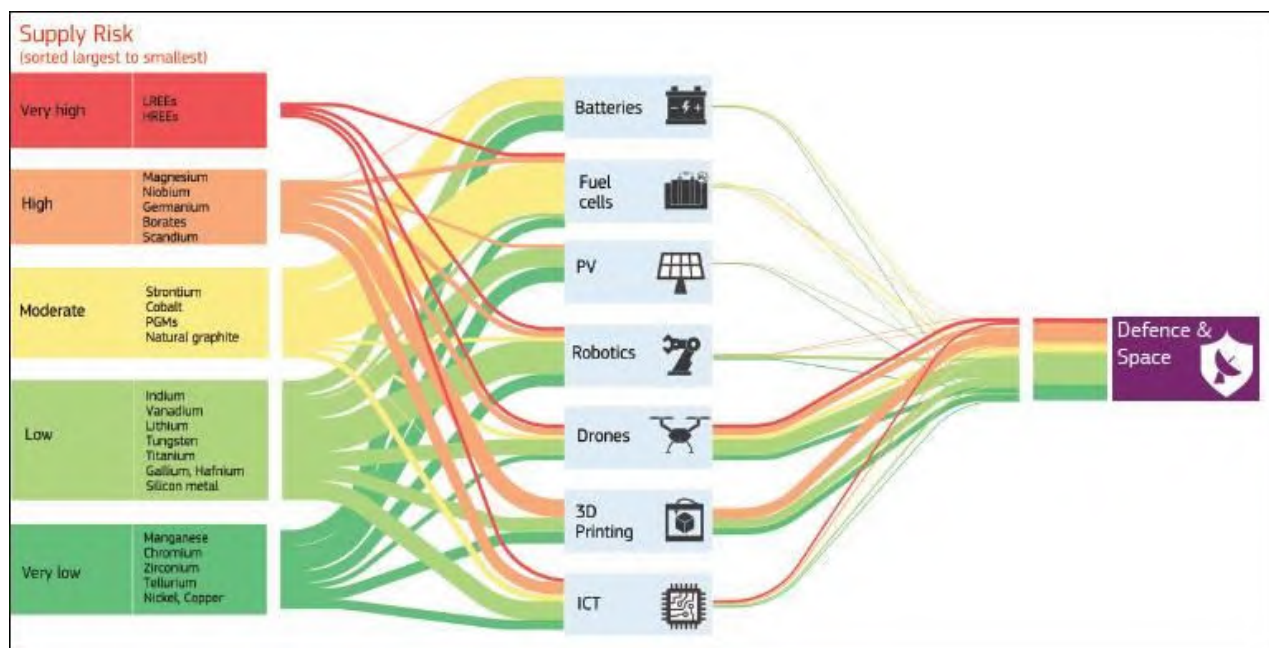
1. Gas customers with an annual consumption of less than 3 GWh;
2. Gas customers that are of considerable importance for life and health;
3. Gas customers that are of considerable importance for the functioning of society;
4. Gas customers that are of considerable importance for the environment;
5. Gas customers that are of considerable importance in terms of social and cultural value;
6. Other gas customers that do not produce electricity;
7. Gas customers using gas to produce electricity.

Protected customers and the gas consumption that is necessary to maintain system operations must not be included in the priority classes. The reduction in consumption must take place through the disconnection of gas customers with the lowest possible priority (gas customers with the highest number in the priority classification). In cases where it is sufficient to limit or disconnect transfers to several gas customers in a priority class, and if nothing else is stated by the general disconnection plan or by any decisions by the competent authority, the distribution system operators may determine how the reduction in consumption is to be divided between the gas customers in the priority classification in question.

Source: National Emergency Plan for Sweden’s Natural Gas Supply, Ref. 2020-002010, version 1.3 (16/02/2022)

Once “societally critical” sectors are identified, then their supply chains could be mapped, including the extent to which imports feed into EU value chains. Although not sufficiently disaggregated and focusing only on risks pertaining to the supply of critical raw materials, an example of such a mapping for the case of the defence and space critical sector and its value chain is provided in Figure 3 below.

Figure 3: Critical raw materials and the supply chain of the defence and space sector



Source: 2020 JRC report on critical raw materials for strategic technologies and sectors

After a mapping of critical sectors and their supply chains is generated, **the economics of particularly energy intensive industry**, in terms of the role of gas and the impact of the energy crisis on industry could be explored. The level of the potential impact of gas disruptions and/or high gas prices on industry depends in general on four main factors:

1. **The energy / gas-intensity of the industries concerned:** the higher the energy/gas intensity, the more vulnerable the industry. It is estimated that before the current energy crisis, energy costs represented from 25% to up to 45% of the total production costs of energy-intensive industries,^{xii} whereas currently these costs have more than doubled, meaning that some parts of these sectors at the upper end of the energy intensity range (e.g. aluminium) are being taken out of business.

^{xii} JRC 2016 report “Production costs from energy-intensive industries in the EU and third countries”

2. **The ability to pass through costs to customers:** many energy-intensive industries have limited scope to pass through cost increases to sales prices in downstream sectors, as most of their products are priced globally. On the other hand, large parts in the world (North and South America, Australia, Middle East) have indeed not been confronted with a cost increase, or only in a limited way, which gradually leads to an insurmountable cost handicap for European industry.
3. **Exposure to global competition:** many EU energy-intensive industries are exposed to global competition, are price takers, and their production could be substituted by extra-EU imports should the cost gap become significant.
4. **Pre-existing vulnerabilities:** such as, lower levels of profitability before the Russian invasion of Ukraine, increasing other costs, such as raw materials; logistic chain issues; etc

Combining the two approaches described above, (1) mapping of industries and their value chains that are critical to society, and (2) mapping of industries most vulnerable from a gas supply disruption perspective, whilst also accounting for the damages to installations and reduction and substitution possibilities criteria may provide a good starting point in shaping a more coherent cross-border process for prioritising non-protected customers at the EU level.

Question:

2. *Which are the industrial sectors or entities that you have identified as being of priority concern for keeping operational and competitive in the short term? How have you accounted for the common prioritisation criteria put forward in the July European Gas Demand Reduction plan?*

4. STATE AID SCHEMES SUPPORTING INDUSTRY ACROSS MEMBER STATES

In their efforts to support the most vulnerable households and firms against the adverse effects of energy price increases, Member States need to consider the impact on public finances, and of the incentives or disincentives for energy savings, particularly since energy supplies are limited and price inelastic. According to an internal Commission document,^{xiii} three criteria need to be considered when assessing fiscal policy measures to mitigate the impact of increased energy prices on households and firms: (1) the fiscal affordability of the measures; (2) the social impact on the most vulnerable (i.e. the progressivity or regressivity of the measures); and (3) the impact on the demand for energy (through the price signal). In short, to keep budgetary costs under control and ensure their effectiveness, measures should be targeted to the most vulnerable households and firms while avoiding measures that promote consumption or offset the price incentives.

^{xiii} Gerrit Bethuynne, Wojciech Balcerowicz and Miklos Erdei, “Budgetary policy measures to mitigate the impact of high energy prices on households and firms: methodology and budgetary impact”, Commission services internal working document, DG ECFIN, 15 September 2022, Ares (2022)7171988-17/10/2022

The fiscal policy measures to reduce the impact of high energy prices on households and firms may be categorised^{xiv} as ‘**targeted / untargeted**’^{xv} or as “**price / income**” measures.^{xvi} In relation to supporting businesses, such measures mainly cover price measures (those that have a direct impact on the marginal cost of energy consumption paid by firms, such as price caps/regulated prices, indirect taxation, and changes to levies and subsidies on energy products) and measures providing compensations to firms (other than price measures, such as temporary support to energy intensive industries), irrespective of whether the income support is used for energy consumption or not. The analysis finds that, as of end of August 2022, the overall budgetary cost of support measures to both households and firms that are specifically linked to energy prices or consumption, net of the return from (taxes or levies on) windfall profits of energy companies was estimated at 0.9% of GDP for 2022 (which compares to 0.6% of GDP in spring), mostly allocated to price / untargeted measures (almost 65%), especially in the form of changes to levies (e.g. levies for distribution costs) and subsidies on energy production (e.g. subsidy schemes for renewable energy production), estimated at around 0.4% of GDP. However, differences between Member States are substantial, both in the size of the budgetary impact as in the composition of the measures.

^{xiv} As per the Commission internal note referenced in footnote xi above

^{xv} According to the internal Commission ECFIN note Ares (2022)7171988-17/10/2022: for firms, a measure is considered targeted if it applies to specific energy intensive activities. Here also, the Commission services did not apply a specific threshold, but considered whether the measure is applied selectively, i.e. it applies to a limited subset of all corporations, broadly based on the energy intensity of the firm or industry. Typical examples include: a reduced price for access to the power grid for specific energy intensive industries; an exceptional subsidy per vehicle for transport firms or exceptional support for agriculture based on land area.

^{xvi} Price measures are those measures that directly affect the cost of consuming an additional unit of energy. As a result, they have a direct effect on incentives to reduce energy consumption or to increase energy efficiency. Income measures do not directly depend on the amount of energy consumed by each entity (e.g. by a poor household or a vulnerable SME) and therefore preserve incentives reduce demand or save energy. A measure addressed to energy intensive corporations may provide a tax credit / refund based on energy consumed. If the tax credit is directly proportional to the amount of energy consumed, Page 6 of 10 the measure will be considered a ‘price measure’ as it affects the marginal cost of energy consumption, even though it may not be immediately visible from the energy provider’s invoice.

A detailed and systematic summary of fiscal policy responses across Member States to the energy crisis is also provided by a Bruegel study. It finds that the government allocated funding (over the period Sep 2021 - Sep 2022) to shield households and businesses from the energy crisis amounted to around 350 billion euros and varied considerably across EU countries, with the highest support, when expressed in terms of % of GDP, given in Croatia (4.1% of GDP), Greece (3.7% of GDP), Italy (3.3% of GDP) and Latvia (3.2% of GDP) or, when expressed in billion euros, given in Germany (100.2 bln), France (71.6 bln) and Italy (59.2 bln). The study also classifies the measures into seven types of responses: reduced energy tax / VAT; transfers to vulnerable groups; business support; retail price regulation; wholesale price regulation; mandate to state-owned firms; windfall profits tax / regulation; and others, with the former four types of measures being most often deployed across Member States.

Overall, the findings from both studies discussed above tend to point to the worrying trend of focusing on price measures which may fuel the demand for energy and do not sufficiently tackle the need for energy savings. A more structural solution to the energy crisis would require an increase in energy efficiency and the expansion of the capacity of alternative energy sources, requiring additional investments and ensuring closer coordination in state aid schemes supporting industry across Member States.

Moreover, the prioritisation criteria and potential mapping of critical industries discussed in the previous section could be deployed to identify which economic players are most vulnerable, essential for keeping operational, and benefiting from state support, either via the respective Member State specific policy support measures and/or from the common EU measures as put forward in the Council regulation on an emergency intervention to address high energy prices (i.e. reducing electricity demand; introducing a cap on market revenues for low-cost power producers, and implementing a solidarity levy on the excess profits of businesses active in the fossil fuel sector).^{xvii}

In sum, this discussion paper has highlighted the economic consequences for EU business, and whether Member States are collecting information on temporary suspension of production or partial/total shutdowns. Moreover, the discussion paper has focused on the issue of how Member States are identifying industries of priority concern for keeping operational. Finally, the different forms and extent of state support has been outlined. This sets the scene for a discussion on what EU Member States can do collectively within the Competitiveness Council.

Questions:

3. *To what extent and according to what criteria have you designed your state aid schemes to support industry?*
4. *How can the Competitiveness Council complement the work of the Energy Council to ensure that EU businesses can handle the energy situation within a level playing field, while staying competitive internationally?*

^{xvii} More recently, based on the Commission proposals for [a new package on emergency energy measures on 18 October 2022](#), at the European Council meeting 20-21 October 2022, Member States agreed to intensify efforts to reduce energy demand, ensure security of supply, avoid rationing, and lower energy prices for households and businesses, by putting forward a series of additional measures. These include establishing a joint gas purchase system to negotiate better prices, preparing a new benchmark index to establish the price of gas and to account for increasing LNG penetration, and considering gas price caps, including on the gas used to produce electricity.