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A WHOLESALE GAS PRICE CAP IN EUROPE

Assessing the European Commission's proposal

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EU political attention has turned towards gas price caps

With energy consumers across Europe continuing to reel from the effect of skyrocketing gas prices – and the knock-on impact on electricity prices – policymakers have in recent months been debating the possibility of 'capping' wholesale gas prices. Gas price caps have been suggested as a means of reducing the energy cost burden on consumers, limiting windfall profits for gas producers (mainly outside the EU), or both.

Several different approaches have been suggested by a variety of stakeholders. Among them a price cap on all wholesale natural gas transactions within the EU, proposed by 15 Member States in a letter to the Commission on 28 September. In this paper we focus on the European Commission's proposals of a "gas market correction mechanism" to cap prices of month-ahead trades at Europe's most liquid gas hub, TTF, as outlined in Articles 23 and 24 of the Commission proposal for the Council Regulation *Enhancing solidarity through better coordination of gas purchases, exchanges of gas across borders and reliable price benchmarks* of 18 October 2022, with further details provided in a leaked Commission non-paper on 15 November 2022. EU energy ministers will discuss this proposal in their next Energy Council meeting on 24 November, but given the controversy surrounding the issue, experts expect a decision to be made by EU leaders at their European Council meeting on 15 December.

We consider some of the generic issues with wholesale price caps before turning to some of the issues with the Commission's specific proposals.

General challenge of price caps: Avoiding price signals to play its role to match supply and demand

Most importantly, a wholesale price cap would restrict the role of price signals with the EU, which are the key mechanism for coordinating supply and demand on markets, across both time and location.

Gas supply is price-responsive – a price cap risks reducing gas supplies to Europe

Supply of most goods increases with prices, since higher prices incentivise the provision of (more expensive) additional supply options. If it binds, therefore, a EU gas price cap risks reducing supplies to the EU both in the short- and in the longer-term:

- In the **short-term** through reduced incentives for gas producers to sell gas in the EU, and to sell some gas to other regions instead. The responsiveness of gas supplies to prices is not a mere theoretical point: LNG import capacity developments in recent years have allowed LNG imports to be a flexible source of supply, which is sold where revenues are highest (as ACER has noted). High European gas prices since the start of the energy crisis have enabled record LNG imports to Europe, helping to fill EU gas storage facilities ahead of winter, which in turn has mitigated the risk of physical gas shortages and non-price demand rationing. If set at a level below prices in

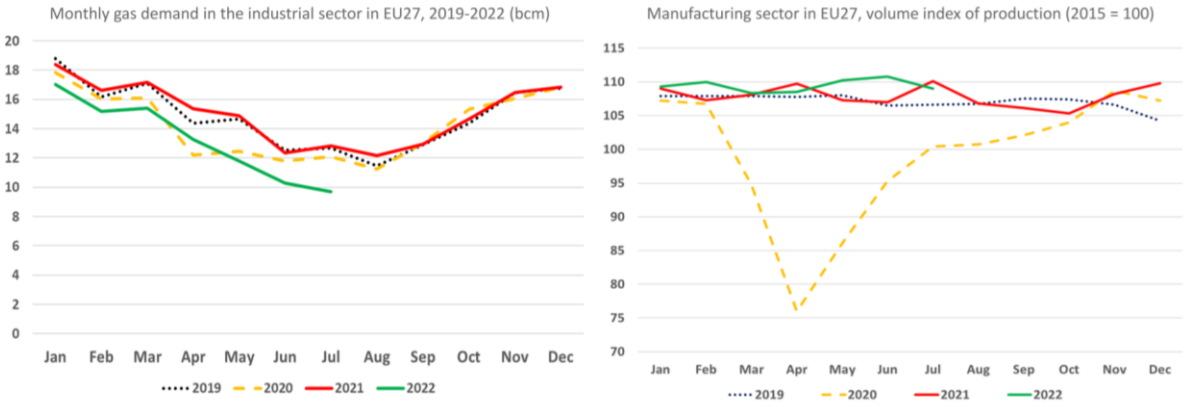
other world regions plus transport cost to Europe, **a EU price cap is likely to steer some gas volumes to other world regions than Europe, exacerbating the strained gas supply situation in Europe.**

- And gas supplies may also be reduced in the **longer-term**, to the extent that price caps reduce investor expectations of future revenues, **diminishing incentives for investment in gas production and gas infrastructure (such as LNG import terminals)**.

Gas demand is price-responsive – a price cap risks increasing demand

On the demand side, higher gas prices in recent months may have helped reduce the risk of shortages. 2022 has seen lower industrial gas demand while EU industrial output has remained broadly stable (Figure 1). This may indicate a combination of fuel switching and energy efficiency in industry, in response to high prices.

Figure 1 Industrial gas demand has fallen in 2022 while output has remained stable



Source: Oxford Institute for Energy Studies (2022) 'Short-Term European Gas Supply & Demand Outlook by Dr Jack Sharples and Dr Anouk Honoré'

Other sources also suggest quite significant demand responsiveness to high gas prices, including for residential customers. A recent study estimates that, over September 2022, small consumers in Germany are likely to have reduced gas consumption by 36% compared to a counterfactual without price increases (which corrects for actual mild temperatures in September 2022).[1] According to the same research, industrial consumers reduced gas demand by 19%, and the power sector by 53%.

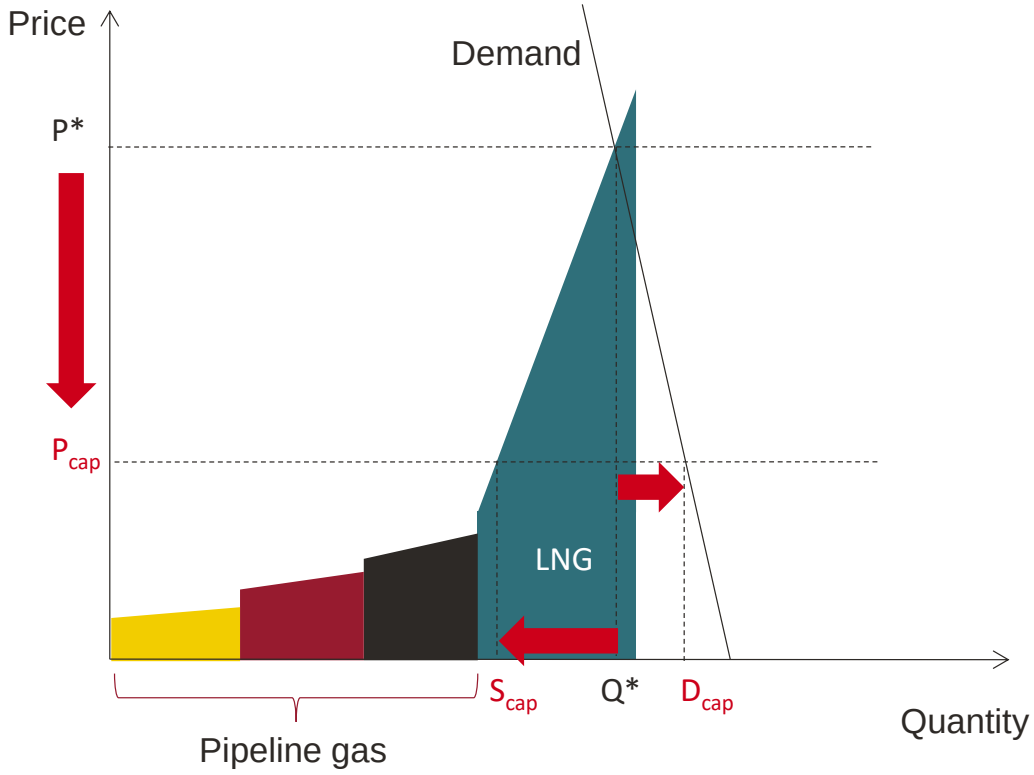
So a (binding) price cap does exacerbate an already strained supply situation

As explained above, the implementation of a wholesale price cap would impair the ability of price signals to incentivise additional gas supply as well as voluntary (price-driven) demand reduction. In case the price cap is binding, i.e. lower than the price at which the market would clear supply and

[1] Ruhnau, Oliver; Stiewe, Clemens; Muessel, Jarusch; Hirth, Lion (2022) : Gas demand in times of crisis: energy savings by consumer group in Germany, ZBW – Leibniz Information Centre for Economics, Kiel, Hamburg.

demand absent the cap, there is more demand than supply available at that price, see Figure 2 for a stylised illustration. [2]

Figure 2 A price cap below the clearing price would lead to reduced supply and increased demand, creating a shortage



Source: *Frontier Economics*

Note: *Illustrative supply curve only. P* and Q* represent the (equilibrium) market clearing price and quantity respectively. S_{cap} and D_{cap} represent the amount supplied and demanded at the price cap (P_{cap}).*

A binding price cap requires alternative mechanisms to match supply and demand, which are likely to be inefficient and challenging to implement

As a consequence of a binding price cap, an alternative mechanism to match supply and demand other than the regular wholesale price mechanism is required – either administrative 'non-price' rationing or a market-based mechanism, such as a demand-reduction auction.

Administrative rationing is likely to be inefficient. Public authorities can develop a priority ordering that determines which consumers will receive gas and which will not in case of gas shortage. When

[2] One potential role for a price cap in a competitive market could be as a technical limit for extreme situations where the market fails to clear, for example, because demand is extremely inelastic. Such technical limits exist currently in EU electricity markets: maximum electricity balancing prices in Germany are linked to the technical price limit on the energy exchange EPEX Spot, thus putting a de-facto limit on prices even on trades outside the exchange. Technical limits for prices in the broader gas market have significantly less distortions than described in this paper and can have the benefit for acting as "circle cycle breakers". Further work would be needed to examine how this could be made to work in practice in EU gas markets,

deciding on this gas allocation authorities can try to take criteria such as the requirements of gas reduction measures (e.g. related to urgency, extent and duration of shortage), the effects (e.g. lead time and size of consumption reduction) and cost (including plant damages, foregone revenues and knock-on effects in the supply chain) into account. It will be challenging for authorities to match, in doing so, the efficiency of decentralised decisions by consumers in a competitive market. This is well summarised by Klaus Müller, president of Germany's energy regulator Bundesnetzagentur (BNetzA), by repeatedly stating that "*in a gas shortage situation there are no longer good decisions*", when talking about the BNetzA responsibility to ration gas demand in a shortage situation.[3]

In addition, there is a significant challenge of administratively allocating gas across borders within the EU. The Security of Supply Regulation may provide some guidance on how this should be achieved. However, the 'solidarity' mechanism set out in the Regulation (which ensures countries agreeing bilateral technical, legal and financial arrangements to ensure supplies to 'protected customers') is yet to be tested. Member States' actions today to restrict exports[4] suggest that **achieving solidarity may be challenging in practice**.

Indeed, it is unclear whether the mechanisms outlined in the Security of Supply Regulation would be sufficient to deal with a shortage affecting most or all of the EU. It is likely that **new, centralised, processes would be required** to administratively allocate volumes across the EU, including dealing with the logistics of transmission capacity booking. **Setting up such processes would take time.**

Specific challenges and open questions of the Commission's 'market correction mechanism' proposal

In Articles 23 and 24 of its proposal for the Council Regulation of 18 October 2022, the European Commission has suggested a 'gas market correction mechanism', which the Commission specified further in a "non-paper" on 15 November 2022. We briefly describe the mechanism below, and highlight some specific challenges that come with it.

Basic principle: A price cap on TTF month-ahead trades

These are the key elements of the 'market correction mechanism' as proposed by the Commission:

- Capped product: **Month-ahead** derivatives at **TTF**, Europe's most liquid gas hub. Explicitly **no cap on OTC ('over-the-counter') trades**, i.e. trades outside exchanges.
- Determination of cap: pre-fixed static maximum price in €/MWh, but **no indication on the level of that maximum price yet**.

[3] See, for example, this Spiegel article.

[4] For example, Croatia and Hungary have moved to limit gas exports. On many EU interconnection points, bilateral solidarity agreements are yet to be agreed, though the Commission has recently proposed default solidarity arrangements to apply where bilateral solidarity arrangements are not in place.

- Trigger: Cap is only to be activated if the TTF-price basis reaches a pre-defined (yet unknown) level and if the price hike does not correspond to a similar hike at world market level (comparison with LNG prices, based on LNG index yet to be developed by ACER). Monthly review that may lead to suspension if trigger no longer applies or any unintended effects on security of supply are observed.
- Duration: Expected to come into effect on **1 January 2023** and last for **one year** (in any case temporary).

Fundamental issues of any price cap likewise apply to the Commission proposal

Generally, the risks of any wholesale price cap approach as described above – namely **reduced supply, increased demand and need for non-price rationing** – do also apply to the 'gas market correction mechanism' as proposed by the Commission.

There are some **specific issues** to consider with the Commission proposal, as we explain below.

Determination of cap as yet unclear

The latest Commission outline (of 15 November) does still not elaborate on how to set the cap level. Some thoughts below:

- No price level is mentioned by the Commission, but in its latest outline the Commission refers to the exceptional price hike evidenced in the month of August 2022, where TTF month-ahead prices exceeded €300 per MWh, so the price cap can be expected to be (significantly) lower than that. For comparison: On 17 November, the day before publishing this paper, TTF month-ahead prices were at €114 per MWh, and at €122 for subsequent months.
- In general, **the higher the level of the price cap (relative to international gas prices), the less severe the issues and risks** we elaborate on this paper, but the less effective the mechanism in achieving the Commission's intention of preventing '*excessive episodes of extraordinarily high gas prices'*.
- Similar proposals have suggested a 'dynamic' price cap linked to global (e.g. Asian) LNG prices, plus some margin to provide an incentive, in principle, for exporters to continue to supply the EU (instead of diverting LNG to other markets). There may be issues with some of the specific **international benchmarks** that have been proposed, though, as these **tend to be less liquid than European markets**. The Japan/Korea Marker (JKM) index, one of the specific indices proposed, is, unlike TTF, based on reported (rather than actual) trades. Also, **if financial trading shifts to platforms outside the EU, EU regulators may lose the ability to monitor market abuse and take corresponding enforcement action**. And generally, an index formed in another regional market does not reflect supply and demand in Europe (see general issues of a price cap above).

The Commission recognises the challenges of a comprehensive cap …

Under the Commission's proposal of a gas market correction mechanism, the cap would apply only to month-ahead transactions on exchanges for deliveries to the Virtual Trading Point TTF.

- With **restricting the cap to exchange-based trading**, the Commission recognises the **practical challenges associated with capping prices of bilateral or OTC trades**.[5] Plus, the Commission sees the **uncapped OTC market as a '*safety valve*' in terms of security of gas supply**.[6] In other words, the opportunity for consumers – or their suppliers – to purchase gas OTC at prices above the exchange-focussed price cap has the objective to avoid that exporters direct their gas elsewhere than Europe.
- With **restricting the cap to month-ahead derivatives**, the Commission pays respect to the concern that a cap on spot / day ahead products "*would involve higher risk for liquidity of short-term markets & security of supply*".[7]
- With targeting trades for deliveries to the Virtual Trading Point **TTF in the Netherlands**, the Commission focusses on the EU's **by far most liquid gas hub**, which also serves as price reference for many trades with other delivery points outside TTF, for example in long-term gas supply contracts.

… but capping only sub-markets (here: exchange-based TTF month-ahead trades) comes with substantial unintended consequences to the whole market

With restricting the price cap to only a sub-market, the Commission acknowledges some of the fundamental risks of price caps – as for example the risk of a price cap possibly incentivising exporters to redirecting their gas (LNG in particular) to other regions than Europe.

However, even if only a sub-market is regulated, this will inevitably **feedback to other sub-markets**, and may have **severe negative and unintended consequences – which can be more severe than 'just' the price cap not being effective.**

Restriction to exchange trading may lead to move to OTC with significant downsides

If sellers are bound to the cap when selling at an exchange, but can sell above the cap in OTC trades, they have an incentive to sell OTC. And buyers have an incentive to buy at prices above the cap if otherwise they have to fear to be rationed and do not get the gas they need. This may move liquidity away from exchanges. The use of exchanges may have played an important role in helping some players mitigate the impact of current market volatility on credit and collateral requirements (e.g. by facilitating margining on 'net' positions). Capping exchange prices only may inhibit parties' ability to manage risks in the way that best suits them.

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5 "Over-the-counter trading would be very difficult to monitor" (Commission non-paper, page 3). In principle, ACER should have access to data on all transaction prices (under REMIT) to verify the price of OTC transactions. However, using this data to enforce a price cap would either require changes to REMIT or new legislation.

6 Commission non-paper, page 2.

7 Commission non-paper, page 2.

Restriction to TTF may lead to move to other EU gas hubs

The motivation behind targeting TTF is well understood given the pronounced role of TTF as price marker for EU gas trades. However, analogously to incentives to move to uncapped OTC trading, sellers may have incentives to bypass the cap by offering gas on other, non-capped, European gas hubs such as THE (in Germany) or NBP (in UK). There is, however, much lower liquidity on these other hubs today, so they currently provide a very limited opportunity for hedging. In any case, a move to other hubs would render **the cap mechanism increasingly ineffective**.

If there were hope that, despite most trades moving to OTC or other hubs, prices in long-term contracts that are indexed to TTF would still be reduced, we doubt this would be sustainable: Most long-term import contracts have reopening clauses that can be triggered by significant regulatory change or if an index, such as TTF, becomes unrepresentative. And the EU is already taking steps towards defining a new benchmark for LNG contracts. So following the introduction of a price cap (which may well be interpretated as a significant regulatory change) **we expect prices in these long-term contracts to be adjusted so they would reflect the market value again**. If gas import contracts were even to be **terminated** in case of the implementation of a price cap, this would **further exacerbate the issue of reduced gas flows to Europe**.

Negative effect on forward-markets despite limitation to month-ahead

Even though applied only to month-ahead transactions, a price cap would likely also affect trading on the forward market. This holds, at least, for trading of products up to a year ahead, the expected duration of the price cap measure, as the market would know the cap could be applied to limit the front month. Because market participants would not be willing to trade above this price for a quarterly product within that year, for example. Additional uncertainty about the actual duration of the intervention (who guarantees it won't be extended after one year?) may further reduce the willingness of parties to trade on the forward market.

In effect, **liquidity on forward markets will be reduced**. As a consequence, it will become **more difficult for market participants to manage risks**, with potential consequences for competition among both traders (shippers) and retailers.

In addition, the mechanism would have a **distortive effect on open futures positions**: Market participants may not have expected a price cap when buying or selling gas forward, which could lead to **unintended (windfall) gains and losses on existing positions**. The effect could be significant: the value of open interest[8] on futures products for just a subset of the key markets on which gas is traded in Europe may be **in the range of EUR 160 billion**.[9] Windfall gains or losses resulting from such regulatory intervention may well result in contract disputes, as explained above.

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[9] We refer to ESMA reports that calculate volumes of open interest on ICE for TTF futures and on EEX for TTF and NCG futures. These volumes averaged at approx. 1,500 TWh between March 2020 to and March 2021. Since this represents the most recent information published by ESMA, we use ICE data on open interest in TTF futures and options to adjust for the subsequent fall in liquidity. According to ICE, open interest averaged at 2.6 million contracts between March 2020 and March 2021, and fell to around 1 million contracts by October 2022, i.e. decreased by 60%. This results in an estimated figure for the current volume of TTF/NCG open interest on ICE/EEX of approx. 600 TWh. Taking into account that exchange-based trading represented 54% of overall gas trading on TTF in 2020 (see recent OIES publication, page 3-5), and assuming this still holds today, and that our estimate for ICE/EEX exchanges can

So what to do instead?

As explained above, the proposals under discussion to cap wholesale gas prices may be challenging to implement in practice and may exacerbate security of supply risks. There are a number of other steps that can be taken to mitigate the impacts of the current crisis, which come with fewer drawbacks.

- **Ensuring signals are in place for demand response** across all sectors (households, commercial, industry and power) and efficient use of storage and transportation infrastructure. As part of ensuring this, **relief to customers should be provided directly** (i.e. not via wholesale price interventions)**, be granted independent of actual future consumption to not disincentivise demand reduction (i.e. as "lump sum"), and possibly targeted to those in highest need**, for example low-income households or industries that cannot pass-on higher energy cost to their products;
- **Finding new ways of working with international partners to boost production and export capacity and diversify supplies**. In doing so, the EU should consider how best to reduce costs to consumers over the long-run (for example, how best to provide long-term visibility for producers while also accommodating the transition towards lower-carbon energy);
- **Considering how transportation bottlenecks within the EU can be best addressed,** particularly between Spain and France, between France, Benelux and Germany, and from Germany to Eastern Europe, to allow LNG imported to South and West Europe flow to Central and East Europe. Again, these decisions need to have an eye to the longer-term transition, avoiding stranded assets and carbon lock-in; and
- **Accelerating efforts to decarbonise the EU economy**, including through reduced energy consumption and increased production (and imports, from diverse sources) of low-carbon and renewable energy.

In any event, the implementation of a **wholesale gas price cap is a fundamental market intervention**. We doubt that we – or any other stakeholders or policymakers –yet understand the full implications of this proposal, given the speed of development of policy proposals. Before taking such a measure, it will be crucial that its **design and impacts are assessed more thoroughly, to avoid significant unintended negative consequences**.

be extrapolated to OTC trading, we calculate a total volume of open interest of approx. 1,100 TWh. We value this open volume at EUR 137.1/MWh (weighted average of prices for TTF Cal 2023 and Cal 2024 over 1 to 24 October 2022), thus estimating a total open interest value of EUR 160 billion. This figure does not include open interest on other exchange platforms (for TTF and NCG/THE products) and on EU gas hubs other than TTF and NCG/THE.