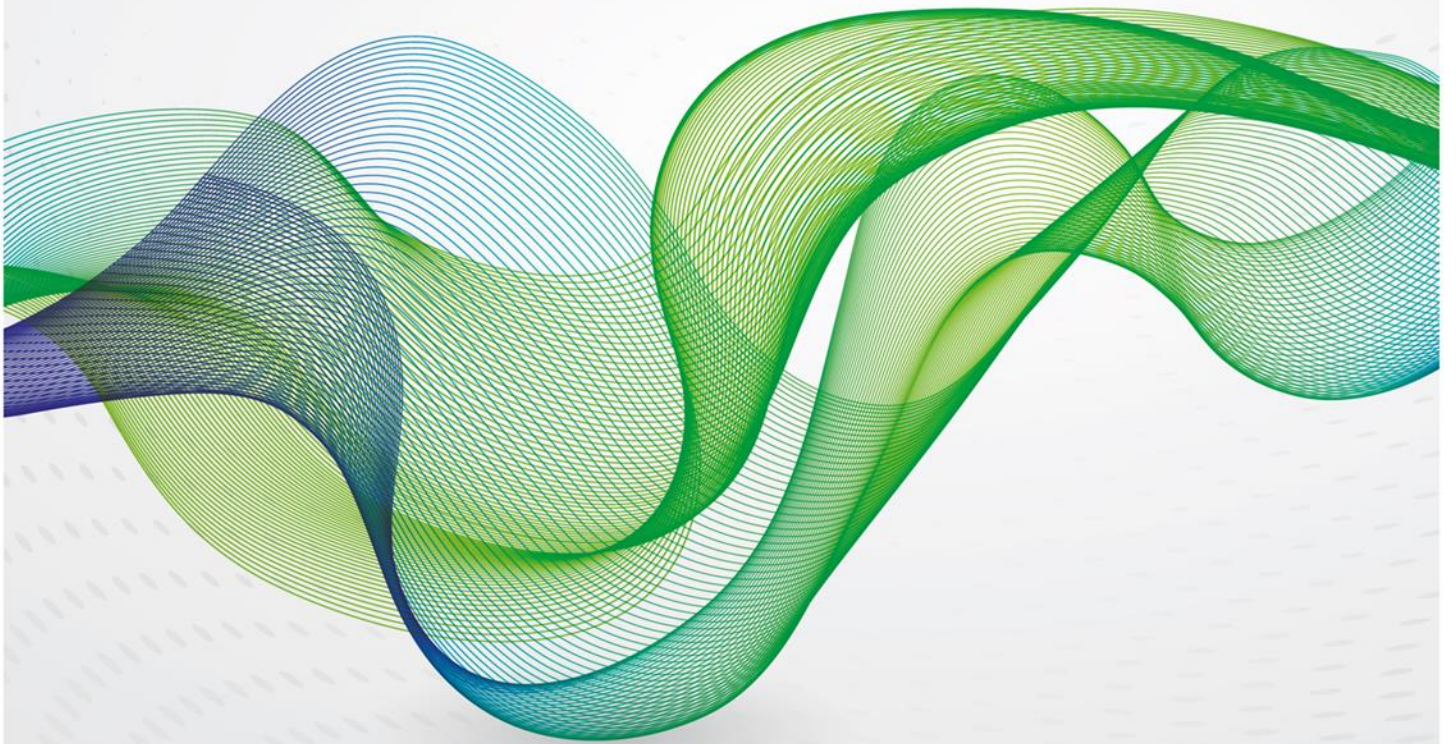


October 2022

The Consequences of Capping the TTF Price



The European Commission and the EU's political leaders have been involved in lengthy discussions on the high levels of wholesale gas prices, especially TTF. Ursula van der Leyen, the European Commission President has made the following six statements in the last few months:¹

- 'A corridor of decent gas prices with our reliable suppliers, talks under way with Norwegian companies'
- 'A limit on the market price of gas, taking out the peaks and speculation at the TTF level'
- 'A partial decoupling of gas prices in the formation of power prices' (proposal not before the end of this year)
- 'Such a cap on prices must be designed properly to ensure security of supply. And it is a temporary solution to cater for the fact that the TTF – our main price benchmark – is no longer representative of a market that includes more LNG today'.
- 'Longer term, a new EU gas price index would ensure better functioning of the market'.
- 'By next Spring it is paramount that we have joint procurement of gas and we avoid outbidding each other'

Meanwhile, the Belgian Prime Minister² has reportedly discussed 'A dynamic limit on the price of LNG that could be pegged far enough above prices in the US and Asia to ensure continued flows to Europe'.

The issue that the EU leaders have been grappling with is that they believe the TTF is no longer a representative price for gas supplied to the European market, apparently because it is higher than other hub prices and also higher than the LNG price. This is illustrated in Figure 1, which is for the month-ahead daily quotes for TTF, NBP and LNG NWE.

The EU leaders' belief and the supposed analysis behind the quotes is largely inaccurate but this Comment will not completely cover all the arguments as to why this is the case, but focus on the possible consequences of what the EU are proposing or might propose. In brief, the arguments on the correctness of the EU leaders' belief rest on the assumption that they TTF price is not representative of the market price for European gas. As noted below this argument is false and is very much a case of "shooting the messenger" rather than analysing the real problem which is a loss of supply and constrained infrastructure.

¹ Platts European Gas Daily, 7 October 2022

² Belgian Prime Minister

Figure 1: Month Ahead European Prices



Source: Argus Media

At the beginning of April, gaps opened up between TTF, NBP and the LNG NWE price, with LNG NWE and NBP at large discounts compared to TTF. European leaders have assumed that the TTF price, therefore, is at fault and is not an appropriate price for European gas. It is not the purpose of this Comment to discuss this point, but suffice to say, the author believes that this is an incorrect analysis of the situation. NBP and the LNG NWE prices have been at large discounts compared to TTF as a result of congestion, both on the interconnectors exporting gas to Belgium and the Netherlands and the LNG import terminals at Dunkerque, Zeebrugge and Gate. The congestion means that not enough gas can get into the pipelines and terminals and, as a result, the respective prices fall to a discount compared to prices at the other end of the bottleneck.

This Comment considers which prices might be capped if the EU decides to go down that route, and what might be the consequences of capping TTF. It is important to note, however, that implementing such a cap would be very difficult in practice.

Which prices might be capped?

The frequently talked about prices to be capped are gas and electricity prices and these can be wholesale or retail. Retail prices are somewhat easier to cap and, in some cases, are regulated. This discussion will start with wholesale prices.

Wholesale gas prices

Over the past three decades the EU has undertaken a co-ordinated strategy to liberalize the gas market in Europe in order to ensure competition between suppliers and access to similar prices for all consumers across the EU. As a result, the wholesale gas price setting on TTF and other hubs around Europe are totally unregulated markets. This is not to say that the process of trading on TTF and the other exchanges is not subject to some form of regulation. The financial regulations of REMIT, EMIR and MiFID II were brought in 10 years ago to prevent market manipulation and ensure financial stability on traded energy markets in the wake of the financial crisis, prior to which they were very much unregulated. Also, network code balancing rules govern physical settlement, while traders are licensed, meaning that they are required to have shipper licences if trading at NBP and other hubs.

The markets were set up by market participants, with price reporting agencies coming in to assess prices and then electronic exchanges established (futures and then physical) to allow anonymous trading. The exchanges and, to some extent, the price reporting agencies are regulated, but the rules are focused on process and financial regulation. Price, however, is not regulated.

If an authority decided to say that the TTF price on an exchange, for example, could not be above a certain level, then trading would migrate to over-the-counter (OTC) trades between individual counterparties, which is where the market initially started. With no oversight at all over the OTC market, these prices would be pretty much impossible to cap. The potential disruption this might cause in the market could be substantial, as it would lead to a more bilateral form of buying and selling rather than the more efficient exchange trading we have today.

To date, no authority has attempted to cap the wholesale gas price. Indeed, if they did try then gas, and in particular LNG, would simply flow to markets where the price was uncapped and therefore higher – most likely in Asia. However, what can be capped is the passing through of the wholesale gas price to other markets such as the power generation market and the retail end-user market, but this is not capping the wholesale gas price.

Wholesale electricity prices

Wholesale electricity prices in the EU and the UK are formed on a marginal cost basis. This means that the price is set by the cost of generation of the last power plant needed to satisfy demand – the marginal producer. All power plants that are used receive this marginal price, meaning that lower cost producers can make good profits. Normally, this system provides both a competitive source of electricity and incentivizes new investment in lower cost sources of electricity. However, in exceptional circumstances such as in 2022, it can lead to very high price outcomes, when, as at present, gas-fired power plants are the marginal cost producers due to a number of issues in the European power system (lack of hydro, nuclear maintenance, lower than expected wind over the summer). Given the surge in gas prices, due to the reduction in supply from Russia, the marginal cost of electricity generation is being set at very high levels by high-cost gas-fired plants. As a result, providers of lower cost sources of electricity (renewables, operating nuclear plants) are making extraordinary margins.

As a result of this pricing mechanism, one option to lower the electricity price is for governments and/or regulators to cap the effective gas price charged to generators, which in turn brings the wholesale electricity price down. However, this comes at a cost to the taxpayer since the generators still have to buy gas at the wholesale price but can't pass through the cost to consumers. In a similar example, the Spanish authorities have capped the price at which gas can be charged into the power generation market, which is effectively capping the gas sales price to power stations generating electricity with gas. However, the suppliers of this gas to the power stations need to be compensated for the difference in the price charged to power generators and the price at which the gas has been purchased in the wholesale market. This difference is made up by the taxpayer.³ There has been some discussion about how governments might ease this burden on the taxpayer using windfall profits on energy companies that have made exceptional profits over the past six months, but this is an area of considerable debate and difference of opinion across various countries.

Over the longer-term a more sustainable solution would be to change the market design in the wholesale electricity market so the wholesale generation price was not determined on a marginal electron basis. Many regulators and academics are working on a number of proposals including a two-market solution – one for low cost but intermittent sources of supply and one for higher cost but stable sources of supply. Other proposals include averaging the costs of different sources of generation used in the market in real time; and locational pricing of electricity, that is, where do the electrons which a region is using actually originate from and what are their costs. The exact workings of all the potential

³ It should be noted that gas imports into Spain are still largely oil-indexed pricing so the overall cost to the taxpayer is much less than if all gas was at hub prices.

new designs have not been finalized and involve many complexities, but the overall goal is to avoid the electricity price being purely set by the gas price. Transitioning to this new market design is another issue, because forward trades and hedging in the electricity market are currently undertaken on the existing market design.

Retail prices

This brings us to retail prices, or the prices paid by end-users such as households and businesses. The level of regulation applied to these prices varies across European countries, but in most countries the gas and electricity prices at the retail level are ‘passed through’ based on the wholesale gas and electricity prices, albeit in some cases with a lag. In other words, retail consumers pay a price that is at least as much as, and is normally higher than, the wholesale price, to cover the network costs, taxes and environmental charges, plus a small margin in order to allow the gas or electricity provider to make a profit. The level of this profit is then regulated by a domestic authority to prevent excessive returns being made at the expense of consumers.

Therefore, if governments and/or regulators decide to cap retail prices, potentially meaning that they will be lower than the wholesale price, then once again the taxpayer has to fund the difference between the wholesale cost in the market and the costs that can be passed through in the now-capped retail price. If this did not happen, then all retail energy suppliers would quickly go bust. An example of this process is about to be seen in the UK, where the government has introduced a price cap for sales of energy to retail consumers which is much lower than the wholesale price. The cost of this is highly uncertain. It was initially set to last for two years, with potentially a very high cost, as the UK Government had effectively taken a very large short open position in the market. The UK’s new Chancellor of the Exchequer, Jeremy Hunt, announced recently that the existing energy price guarantee would only last until April and a new price guarantee structure would then be put in place, likely to be more focussed on lower income households and businesses most exposed to high energy prices.

Within the EU, many countries have also put in place caps on the retail gas and electricity prices. Countries where retail price caps have been enacted or proposed are Austria, Belgium, Bulgaria, Czech Republic, Estonia, France, Germany, Hungary, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia and Spain.⁴

European Commission Communiqué – 18 October 2022⁵

The recent European Commission Communiqué included a number of suggestions on dealing with the energy crisis. This covered a possible single EU buyer of gas as well as limiting the impact of high gas prices on electricity prices, as has already happened in Spain and Portugal. The Communiqué also discussed a number of options designed to directly address TTF prices. These were:

- *‘The Commission therefore proposes developing a new complementary price benchmark for LNG. An LNG-based benchmark would be a more accurate basis for LNG transactions, offering a fairer and more transparent price index. The European Union Agency for the Cooperation of Energy Regulators (ACER) should collect the information necessary to create this new benchmark by the end of 2022 and the index should become available in time for the next filling season early 2023.*

⁴ For full information see the report by Bruegel <https://www.bruegel.org/dataset/national-policies-shield-consumers-rising-energy-prices>

⁵ European Commission (2022). ‘Proposal for a Council Regulation Enhancing solidarity through better coordination of gas purchases, exchanges of gas across borders and reliable price benchmarks’, 18 October 2022, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0549>

- *While this benchmark is being developed, the Commission proposes to put in place a market correction mechanism to limit prices via the main European gas exchange, the TTF,⁶ to be triggered when needed. The correction mechanism would establish, on a temporary basis, a dynamic price limit for transactions on the TTF. The communique refers to this as a last resort measure and it appears that it may take some time for the details to be finalized.*
- *In order to limit intra-day volatility, the Commission proposes introducing a new temporary intra-day price spike cap mechanism to avoid excessive price volatility and prevent extreme price spikes in prices on energy derivative market.⁷*

The Commission proposals are based on the assertion that the TTF price has been too high and is not representative of the market. While the arguments why that is a completely misleading analysis of what has been happening is beyond the scope of this Comment, we will consider what might happen if the Commission tries to limit prices on TTF, if they chose to trigger that mechanism.

The proposal to limit intra-day volatility on the exchanges would simply reflect what happens in some derivatives market, especially those in the US. The Chicago Mercantile Exchange (CME), where the Henry Hub futures contract is traded, has price limits and price banding. Price limits are the maximum price range permitted for a futures contract in each trading session. These price limits are measured in ticks and vary from product to product. When markets hit the price limit, different actions occur depending on the product being traded. Some markets may temporarily halt until price limits can be expanded or trading may be stopped for the day based on regulatory rules. Different futures contracts will have different price limit rules.

Price banding is a similar mechanism which subjects all orders to price validation and rejects orders outside the given band to maintain orderly markets. Bands are calculated dynamically for each product based on the last price, plus or minus a fixed band value. Thus, if markets quickly move in one direction, the price bands dynamically adjust to accommodate new trading ranges.⁷

What might happen if the TTF price was capped?

The Commission proposal to limit TTF prices via European exchanges – and it is important to note that TTF is not an exchange; TTF is a price and is traded on exchanges and over-the-counter – is a partial way to try and limit TTF prices but would not deal with the over-the-counter market, so it is unclear how effective that might be.

However, while implementing an effective price cap on TTF might well prove impossible, if it was possible to do so, what might the effect be? The box considers an example of how gas is hedged in the market currently, involving putting gas in storage, with no price caps involved, and then considers what might happen if there was some way of capping the TTF price. The hedging example is used because almost all the participants in the market use hedging tools, whether on the derivatives market or over-the-counter, to manage risk and smooth out price volatility.

The simple examples illustrate what might happen if price caps on physical and futures TTF prices were introduced, and could be implemented effectively. The conclusion is that, if an effective cap could be put in place, this would very likely trigger a vast swathe of FMs since the losses of one or more parties could become unsustainable.

There are considerable hedges and positions that have been put on out into the future. Total volumes traded at European gas hubs (of which TTF was the largest), whether physical or futures, exchange or OTC, amounted to just over 66,000 TWh in 2021.⁸ At an average price of, say €100 /MWh (until very

⁶ TTF is not an exchange but the hub and a price. Exchanges are the organizations such as ICE, EEX and others which provide the platform to trade.

⁷ <https://www.cmegroup.com/education/courses/introduction-to-futures/price-limits-price-banding.html>

⁸ Heather. P. (2022). Explaining European gas prices in 2021: the role of the traded gas hubs. OIES Insight 111

recently this was well below current market prices), the total value of all these trades would be some 6 trillion euros – around one-third of the total GDP of the European Union in 2021 at current exchange rates. It would take only a fraction of these trades not to be honoured to cause huge financial losses, not only on the companies and organizations involved in the trading but also banks and other financial intermediaries. It would not be difficult to imagine that the whole financial structure of gas trading could be brought down as more and more counterparties reneged on previously agreed deals.

The Commission do at least appear to have recognised that there could be significant downsides to the temporary price cap. Article 23 of the proposed directive on the Market Correction Mechanism says any cap is 'without prejudice to over-the-counter trades'. Plus 'that it will not affect the stability and orderly functioning of energy derivative market'. However, if OTC trades are 'exempt' and the energy derivative markets are to be in part protected, then it begs the question of how effective any price cap may be.⁹

In terms of the examples given above, in respect of gas being purchased for storage, the most likely outcome is that gas remains in storage rather than being withdrawn, thereby reducing supply in the winter period. Furthermore, capping the prices of physical gas delivered to the EU markets is more than likely to reduce the supply of gas to the EU markets. Putin has already said that any attempt to cap the price of gas from Russia would result in flows being cut to zero.

⁹ European Commission. (2022) 'Proposal for a Council Regulation Enhancing solidarity through better coordination of gas purchases, exchanges of gas across borders and reliable price benchmarks', <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0549>

Hedging Gas in Storage

Current Position

A Buyer (for example an EU utility) buys May gas at €100/MWh and injects into storage. The intent is to withdraw the gas in December where the futures price in May stands at €120/MWh. In order to hedge the position, the Buyer sells December futures at €120/MWh to lock in €20/MWh margin.

As December settlement approaches the December price is €150/MWh so the Buyer buys December futures at €150/MWh and sells December physical on exchange or OTC at €150/MWh.

The position is the futures purchase at €150/MWh and the physical sale at €150/MWh, net out, and the futures sale at €120/MWh is matched with the physical May purchase giving a profit of €20/MWh.

Hedging with a Physical TTF Price Cap

A Buyer (for example an EU utility) buys May gas at €100/MWh and injects into storage. The intent is to withdraw the gas in December where the futures price in May stands at €120/MWh. In order to hedge the position, the Buyer sells December futures at €120/MWh to lock in €20/MWh margin.

As December settlement approaches the December price is €150/MWh so Buyer buys December futures at €150/MWh – so far the situation is the same as the first example. However, the EU has somehow succeeded in capping the physical December price at €80/MWh so Buyer can only sell physical gas at this price, and not at the anticipated €150/MWh. The position now is that the futures purchase at €150/MWh and a physical sale at €80/MWh do not now net out and if implemented would incur a loss of €70/MWh, in addition to the profit on the futures sale at €120/MWh and physical purchase at €100/MWh (€20/MWh), leading to an overall loss of €50/MWh.

The likelihood is that the Buyer calls Force Majeure (FM) on the futures trade and refuses to honour the initial December futures sale and simply does a physical match of the May purchase at €100/MWh and December sale at €80/MWh – realizing a loss of €20/MWh as gas is withdrawn from storage. Having then considered this, the Buyer may simply decide to keep the gas in storage carrying a cost of €100/MWh in the books and waiting until the situation changes on the grounds that the price caps may go away

Hedging gas with a Physical and Futures TTF Price Cap

A Buyer (for example an EU utility) buys May gas at €100/MWh and injects into storage. The intent is to withdraw the gas in December where the futures price in May stands at €120/MWh. In order to hedge the position, the Buyer sells December futures at €120/MWh to lock in €20/MWh margin.

As December settlement approaches the December price is €150/MWh so Buyer buys December futures at €150/MWh – so far the situation is the same as the first example, However, the EU has somehow capped the physical and futures December price at €80/MWh so Buyer buys the December futures at €80/MWh and sells physical gas at this price as well.

The Buyer is in the same position as in the first example - a physical purchase at €100/MWh, a futures purchase at €80/MWh matched by a physical sale at €80/MWh (these two net out), and a future sale at €120/MWh so a profit of €20/MWh.

However, while the Buyer is still in a profit there are one or more participants on the opposite side of this trade, who have bought futures forward at somewhere between €120/MWh and €150/MWh and are now faced with a sale to close out their position at €80/MWh – the EU price cap. These participants then call FM on their futures position – refusing to honour the trades – so the Buyer can't close out its position and is back in the position of a purchase at €100/MWh and a physical sale at €80/MWh – loss of €20/MWh – if the gas is taken out of storage.

Again, the Buyer may just simply keep the gas in storage carrying a cost of €100/MWh in the books and waiting until the situation changes on the grounds that the price caps may go away.

Conclusions

The President of the European Commission has made a number of statements in recent months on what might be done to limit the impact of high gas prices on EU markets. There is a belief, amongst EU political leaders, that the TTF wholesale gas price is no longer an appropriate benchmark price for EU gas, with the only justification being that TTF is at a higher price than other hubs and also the LNG price into Northwest Europe. However, the fact that TTF is at a higher price, is justified because it reflects the congestion in the infrastructure from the UK to the EU via pipeline and in the LNG import terminals into Northwest Europe, causing the NBP and LNG NWE prices to be at large discounts compared to TTF, which in reality reflects the true price of gas in the Northwest Europe market area, including any LNG which comes into that market area. The obvious solution to sort this congestion problem is to invest in the necessary infrastructure, rather than cap TTF prices – deal with the cause of the problem not the symptoms.

The various documents from the European Commission have clearly struggled with the concept of actually capping the TTF price. The latest Communique from the Commission has rowed back somewhat on a comprehensive cap on TTF prices, and appears to allow exemptions for the OTC market and wants to protect the derivative market. This does beg the question of whether the price cap could be effectively implemented.

However, if an effective cap could actually be implemented, the consequences, both financial and physical could be severe for the EU gas market. The high level of trading interdependency at TTF and other hubs would likely be severely compromised if the cap was set at levels below the price in the market. Multiple trades might then not be honoured, possibly bringing down the whole market structure at a huge cost, likely even greater than the cost of bailing out the banks after the 2008/09 financial crisis. In addition, on the physical side, the most likely outcome of a price cap is that less gas would be delivered to the EU gas market and more gas would remain in storage and would not get withdrawn.

In summary, if a price cap on TTF cannot be effectively implemented then it is a waste of time trying to put one in place, and if it can be effectively implemented, Europe is likely to receive less gas and also precipitate a global financial crisis.