

Stabilization of Natural Gas and LNG Prices and the Supply/Demand Balance During the Transition to Net Zero Emissions

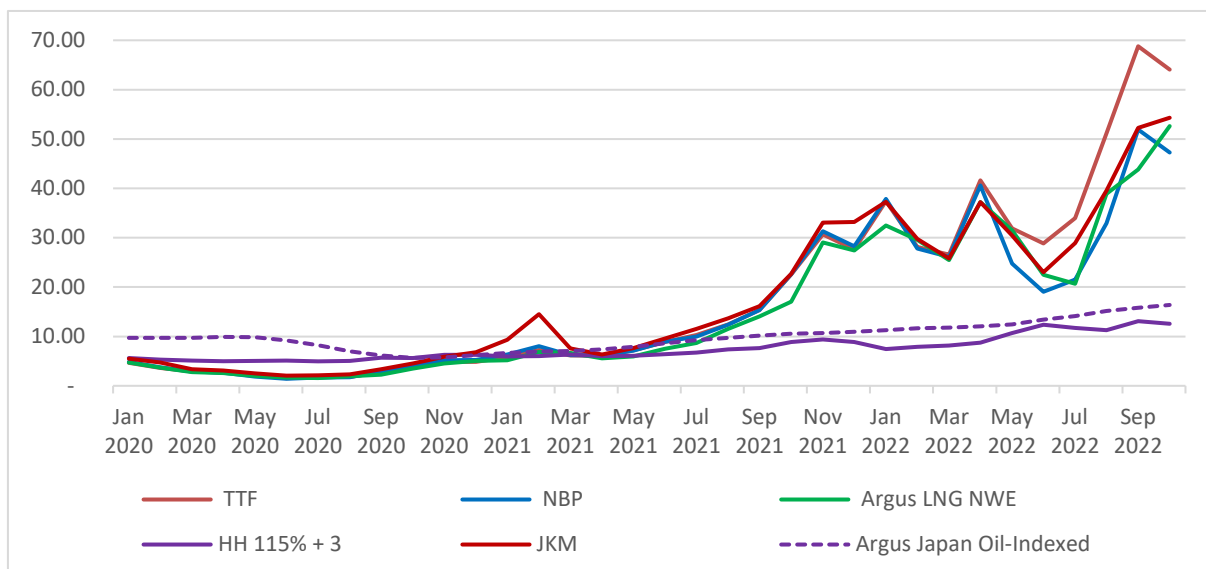
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Natural Gas and LNG Prices 2020-22

After the decade of the 2010s when internationally traded gas and LNG prices were largely in the range of \$5-10/mmbtu, the past three years have seen prices move through two extreme market cycles. Fig. 1 shows a range of widely reported internationally traded gas and LNG prices in the US, Europe and Asia:

- TTF – month ahead prices at the Dutch TTF hub
- NBP – month ahead prices at the British NBP
- Argus LNG NWE – LNG prices in north west Europe reported by Argus
- HH 115% +3 – 115% of US Henry Hub prices plus a \$3/mmbtu liquefaction fee (to which shipping costs would need to be added to provide a delivered cost)
- JKM – Platts Japan/Korea Marker spot LNG prices
- Argus Japan Oil-Indexed - equivalent to Japan JCC LNG price

Fig. 1 European Hub and Asian LNG Prices 2020-22 (\$/mmbtu)



Sources: Argus, Platts and OIES analysis.

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During 2020, natural gas and LNG prices reached historical lows due (largely) to a combination of the Covid-19 recession and global oversupply of gas and LNG. For most of 2020, the JCC oil-linked price was significantly above European levels (as it had been for much of the 2010s). Similarly, the Henry Hub-related price for LNG delivered to Europe was significantly above the European hubs and around 200 US LNG cargos were not dispatched to Europe because exporters could not cover their operating costs. Price levels and differentials changed at the end of 2020 as European and Asian economies recovered from recession, and Gazprom first reduced and then eliminated spot and short term gas sales by the end of 2021. In the second half of 2021 and into 2022, European prices and the JKM spot price spiralled upwards to historically high levels, while JCC and Henry Hub-related prices also rose but much more slowly and a substantial gap opened up between these two groups.

The 2022-23 Crisis

At the end of February 2022, Russia invaded Ukraine causing European gas prices to spike again and from June a progressive reduction of pipeline exports to Europe, and intense government-directed purchasing of gas to ensure high storage levels for the coming winter, caused prices (particularly at TTF) to increase to even more extreme high levels. In the second half of 2022, JKM and NWE LNG prices became strongly correlated below the TTF level as the latter increasingly represented Continental European pipeline gas (rather than LNG) price supply/demand dynamics. Similarly for much of 2022, NBP traded at a substantial discount to TTF as the UK was able to import very large quantities of LNG and (re)export much of this as pipeline gas to Continental Europe (which had never previously been seen as such high levels).

European Supply/Demand and Prices over the Next Two Years

European gas supply and demand over the next two years will be dependent on a number of factors. Most immediately it will be important how cold winter temperatures will be, not just in Europe but, in the north hemisphere as a whole. Broadly speaking the colder the temperatures the higher will be gas demand in countries which are strongly dependent on gas for heating. In July 2022, the EU issued a Regulation calling for a voluntary 15% cut in gas demand between August 2022 and March 2023.¹ If levels of supply fall, or voluntary measures fail to sufficiently reduce demand, the Commission would declare a 'crisis alert' and the 15% cut would be made compulsory. But the 15% figure is misleading because for the August-October period many countries had already achieved this reduction due to high prices and mild weather. The EU has also proposed a 5% reduction in peak electricity demand a general reduction in power demand in order to reduce gas demand in the power sector.

¹ Proposal for a Council Regulation on 'Coordinated demand reduction measures for gas', COM(2022) 361 final. There are a list of derogations (exceptions) for individual countries.

Russian gas, FSRUs and storage

An important question is how much Russian gas, Europe will continue to receive. In November 2022, the only pipeline flows which were operational were around 35-40 mmcm/d through Ukraine and 30 mmcm/d volumes via Turk Stream to Greece and non-EU Balkan countries, around 15% of Russian pipeline export levels. The ongoing conflict means that flows through Ukraine could be interrupted at any time. Flows to Turkey through the both Turk Stream and Blue Stream have remained unaffected. Russian LNG has continued to flow to EU countries (but not to the UK) and although this could also be impacted – either by EU or Russian sanctions – the consequences would not be as serious as the loss of pipeline supplies.

To compensate for the loss of Russian gas, many countries are rushing to install new floating storage and regasification units (FSRUs) in time for the winter season. The key country here is Germany where six FSRUs have been ordered and the first three should be operational around the end of this year or the beginning of 2023. In the Netherlands, two FSRUs began operating in September, and others in France, Poland, Greece, and Finland/Estonia should be in operation by the end of 2023.

The EU also introduced a new gas storage regulation requiring member states to fill their storage to 80% of capacity by November 1, 2022.² In reality by November, due to mild temperatures, EU storage levels were already at 95% (a higher level than the previous year). However, Europeans are already asking how much gas will remain in storage in March 2023, particularly if the winter is cold, and if Russian pipeline supplies are completely interrupted. This is a critical issue because, as long as winter 2022-23 is not too cold, Europe may have sufficient storage to maintain gas supplies without exceptional measures such as power outages and rationing. However, with the likelihood that Russian pipeline gas supply to EU countries will not increase from current levels (and may decline to near-zero), very low storage levels in Spring 2023 would create major difficulties. A general view is that if storages are more than 40% full by April 1, 2023 (the end of the European winter), it will be possible to refill storages in time for winter 2023-24.

Gas/electricity price linkages and ‘price caps

In relation to prices, there is a specific EU (and UK) proposal to change the current situation where in many European countries electricity prices are linked to the cost of the marginal incremental unit of generation, which is gas when renewables are unavailable or insufficient, and are therefore extremely high. This is a long-standing practice dating back to before renewables comprised such a large share of power generation, and demand-side management was not a significant factor in electricity systems. Delinking power prices from those of natural gas is intended to correct the current situation where:

- gas-fired generation may be a relatively small share of overall power generation for the majority of operating hours but is setting the gas price for the entire power market;
- renewable and nuclear generators are making very high profits as their costs remain

² Regulation (EU) 2022/1032, 29 June 2022.

constant, while the prices which they receive (and hence their profits) have increased enormously.

There are a number of proposals for delinking gas and power prices, all of which are relatively complex and could take up to three years to implement. In the short term, Spain and Portugal have placed caps on price of natural gas supplied to power generation and there is a wider discussion about whether similar measures should be introduced more widely in the EU. There has also been a debate as to whether a cap should be placed on wholesale gas prices, principally the price at the TTF hub in the Netherlands. The proposed EU Regulation describes this as, ‘a last resort measure... to establish a maximum dynamic price at which natural gas transactions can take place in the TTF spot markets under specific conditions’.³ Fifteen member states are in favour of such action but there are many problems associated with it.⁴

When could We see a Stabilisation of Prices?

In November, several weeks into the northern hemisphere winter it is very difficult to be optimistic about a stabilisation of European gas prices and also global LNG prices. Very surprisingly, European day-ahead prices (at TTF and NBP) at the end of October briefly fell below \$10/mmbtu but then rebounded at the first sign of colder weather. The November 2022 forward price curve shows TTF prices around \$40/mmbtu for most of next year and into 2024, falling progressively to around \$20/mmbtu by 2025 and further to \$10/mmbtu in 2026.

To compensate for the loss of Russian pipeline gas Europe has maximised imports of LNG which has created a global supply shortage. On the supply side, this will not change significantly until major new LNG projects – from Qatar, the US and East Africa – are brought onstream in 2026-27. However, it is possible that demand reduction caused by a combination of recession and very high gas (and electricity) prices will bring global supply and demand into balance in a shorter period of time. Depending on the severity of the demand reduction, the wave of new LNG could cause the global market to tip into oversupply and low prices before the end of the 2020s. Much will depend on how much LNG Asia – but especially China – will need to import and, aside from general economic conditions, this will also be impacted by Russian pipeline exports to China which may exceed 50 bcm/year by the late 2020s. This suggests that we may not see a ‘stabilisation’ of prices, but a continuation of the extreme price cycles witnessed since 2018 with low price levels as the next cycle.

While this analysis suggests that the forward curve is directionally correct up to 2026, the hallmark of the past two years has been much more extreme short term price volatility than previously experienced as the market reacts much more violently to daily events. We should therefore expect periods of much lower and much higher prices with no stabilisation over the next 3-4 years.

³ COM (2022), 549 final, 18.10.2022, p.8.

⁴ For a discussion of these problems see the Annex to: EU ‘Non-Paper on Emergency Gas Market Interventions’, September 28, 2022. Fulwood M. ‘The Consequences of Capping the TTF Price’, OIES Energy Comment, October 2022.

Beyond the 2022 Crisis – a refocus on transition and net zero targets

The next price cycle will coincide with a refocus on energy transition and the progress which countries have made towards meeting their net zero targets. The chief uncertainty will be how much gas (and energy) demand has been ‘destroyed’. In Europe there are fears of ‘de-industrialisation’ ie that energy intensive plants producing steel, fertiliser and cement may move to lower price countries in the Middle East and North America and may not return even when prices fall. More generally, this period of very high gas prices – even in those regions not dependent on spot prices – is likely to result in a significant decline in longer term European gas demand, a decline which will need to accelerate post-2030 if greenhouse gas reduction targets are to be met.

Writer’s Profile

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