

Q2 2018: TTF volatility commentary

TTF prices and spot volatility surged to their highest level this decade across Mar-Apr 2018 as the 'Beast from the East' cold weather pattern gripped Europe. In today's commentary we are going to:

1. Look at this volatility event in more detail
2. Consider implications for TTF of increasing European import dependency
3. Look at key drivers of hub prices into the summer.

'Beast from the East' volatility shock

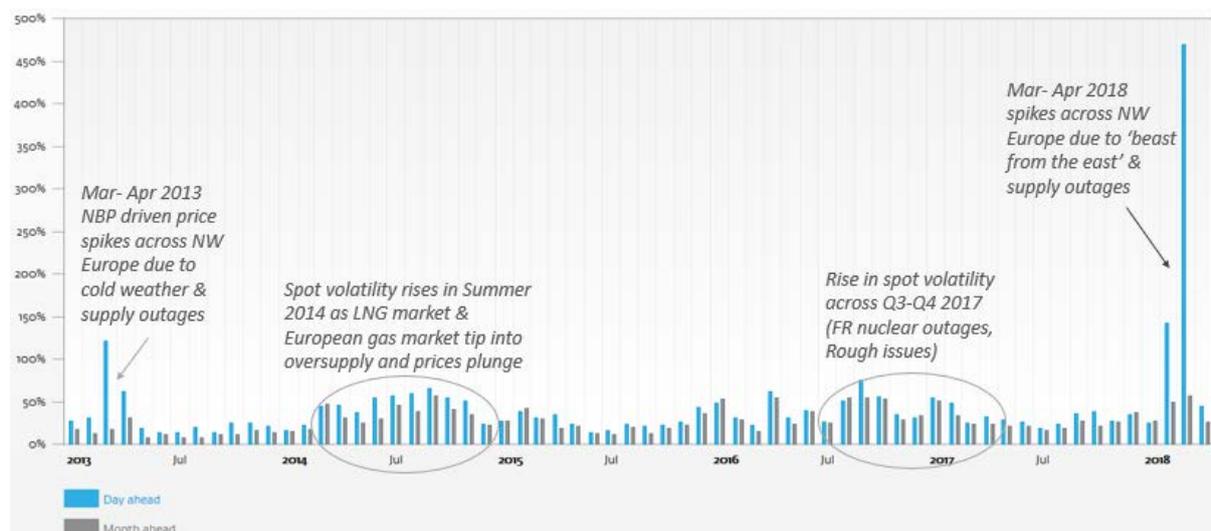
Temperatures plummeted across NW Europe in late February as an unusually cold weather pattern blew in from Russia. This saw a surge in gas demand across North-West Europe.

As is often the case, cold weather coincided with outages in key supply infrastructure (e.g. Kollsnes, SEGAL, South Hook). The Dutch, UK and Northern French gas markets faced extreme tightness. A battle for gas across the BBL & IUK interconnectors ensued with prices at TTF, NBP & PEG Nord surging.

The price signal from NW Europe quickly spread across other hubs, with German storage withdrawals a key factor allowing Europe's interconnected gas markets to clear. Italy and Spain, normally importers of gas, swung into export mode with PSV trading at a significant discount to TTF/NBP.

TTF hub prices rose above 100 €/MWh. The EnergyStock day-ahead historical volatility index for March 2018 surged above 450%. The scale of the price shock is illustrated in Chart 1 below.

Chart 1: EnergyStock historical volatility indices (2013-18)



Price action was not all one way either. A very inelastic supply curve for gas and fluctuations in supply and weather expectations saw spot price volatility well above normal levels from late Feb through to mid Apr. The impact of the shock was prolonged by a second blast of cold weather and very low gas storage levels.

Key lessons from this shock

The ingredients of an individual price shock rarely (if ever) repeat themselves. The key insight this shock provides is how an increasingly import dependent European gas market may behave in future. In summary, increasing import dependency is likely to mean increasing spot price volatility.

Higher import dependency means an increasing reliance on more complex import supply chains. These are slower to react than domestic production nearer to the burner tip (e.g. in the Netherlands and UK).

Over the next 5 years Europe is set to become more reliant on LNG imports. The importance of LNG as a driver of hub prices was experienced during the latest market shock, as the TTF & NBP hubs priced up to levels that could attract spot cargoes away from Asia (where spot LNG prices were also high).

The complexity and slower response time of the LNG supply chain as the 'backstop' source of gas for European hubs is becoming more and more important. A 2-6 week response time to attract adequate LNG import volumes to quell market tightness means that 'market shock' events such as these are likely to increase in both scale and frequency.

Declines in Dutch and UK production are also leading to a greater dependence on pipeline gas from Russia. This may not be as complex as the LNG supply chain, but it is still a long way from production in Siberia to the burner tip in North-West Europe. There are both infrastructure and contractual issues that can result in volatility here as well.

The other important lesson from the recent shock related to basis risk. European gas hubs typically price on a variable transport cost basis to TTF. Under normal market conditions the price basis across hubs is typically relatively stable. But basis risk surged across Feb-Apr 2018. NW European hubs traded at a substantial premium to Southern Europe, NCG at a discount to TTF. A break down in normal basis relationships like this can cause substantial damage to gas portfolios that are not prepared.

Market drivers into summer 2018

Market calm has been restored in Q2 and the focus shifts to the summer ahead. There are 3 interesting factors to watch as we enter summer.

LNG import volumes

The ongoing Chinese policy driven transition from coal to gas for power and space heating saw very strong demand for spot LNG cargoes over winter 2017-18. As this seasonal buying subsides the LNG market is again confronted by the risk of oversupply as new production ramps up.

Asia (particularly China) has a shortage of gas storage infrastructure. That means it tends to pull LNG away from Europe across the winters, but has historically pushed surplus LNG back across the summers. As Asian gas demand falls with warmer weather it will be interesting to

see how much surplus LNG volumes will flow to European hubs. So far Asian LNG spot prices are holding up well into the summer (currently around 9.50 \$/mmbtu), at the upper end of the 1-2 \$/mmbtu variable transport cost differential range above TTF.

European storage levels

The Beast from the East shock (& aftershocks) saw one of the biggest European storage inventory draw downs in history. High withdrawals through Mar into Apr caused an unusual depletion of stocks.

Inventory replacement means buying summer gas. This has been a factor supporting summer prices at TTF and other hubs. This is of course temporary in nature but for the moment has put downward pressure on the gap between prices this summer and next winter.

However the impact of storage buying has also been somewhat confused in the trade press with another key driver of higher prices: switching levels in the power sector.

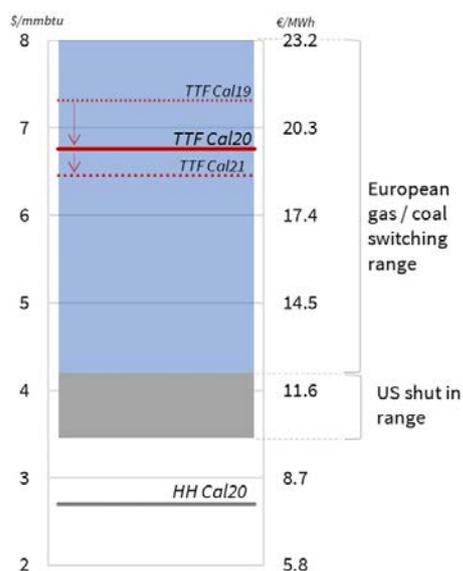
Power sector switching

Switching of coal for gas plants in the power sector is currently a key driver of the marginal clearing prices across European gas hubs.

Switching is a relatively simple concept. As gas hub prices fall, gas-fired power plants become more competitive relative to coal plants, with load factors and gas burn increasing accordingly. This creates additional gas demand and supports hub prices. The process works in reverse as hub prices rise.

Switching is a very important driver of TTF hub prices across an approximately 12-25 €/MWh price range as shown in Chart 2 (although this range depends on coal & carbon prices).

Chart 2: Switching price range at TTF



Within this switching range, movements in coal and carbon prices have an important feed through impact on gas hub prices. This is because a rise in coal/carbon price increases the volume of power sector gas burn at any given level of TTF price. In other words, it raises coal for gas price switching levels in the power sector.

Both coal and carbon prices have been rising in Q2 and this has provided key price support for TTF (in addition to storage demand). So will also be worth watching the direction of coal and carbon prices across the summer as a guide to the direction of TTF prices.