Don’t count on oil to solve the natural gas crisis

- The natural gas crisis is spilling into the oil market, pushing Brent prices above USD 80/bbl, as the two commodities are linked through a variety of channels.
- Oil is only partly the solution to the current global energy crunch because it plays a marginal role in the generation of electricity and the degree to which plants can be converted from gas to oil is limited.
- However, oil prices are likely to remain elevated as a result of both the increase in demand to replace gas with oil where possible and by arbitrage opportunities for switching extraction between the two commodities.

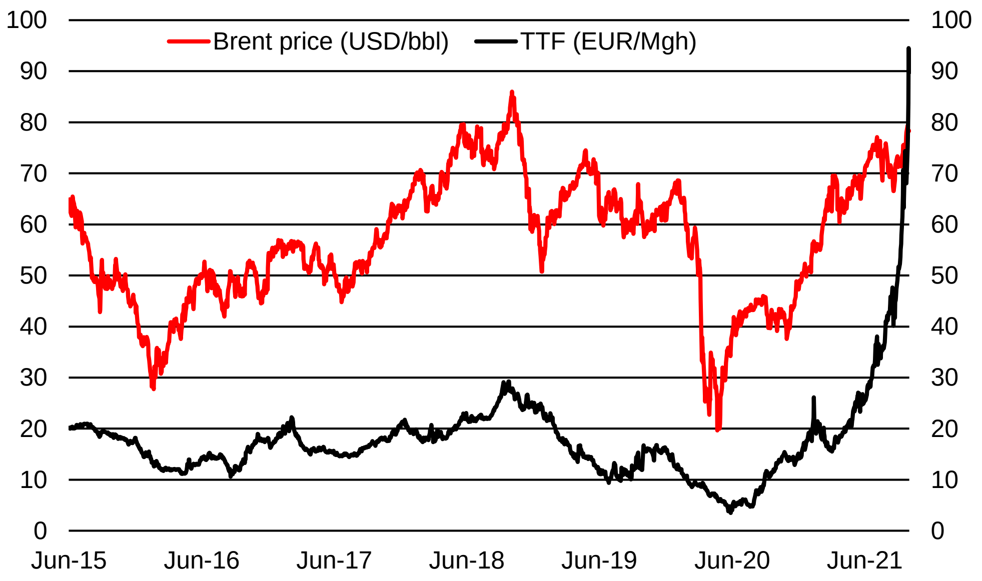
After stabilizing at around USD 70/bbl during the summer, Brent prices have surged over the last ten days, moving up by more than 10% to surpass USD 80/bbl – the highest level since October 2018. The leg-up is the result of the global energy crunch stemming from the power market, with Europe being the center of the natural gas shortage. Gas prices at the Dutch TTF hub – a European benchmark – have increased by almost 370% since January, jumping from EUR 19/MWh to around EUR 90/MWh (Chart 1). On the other hand, the Henry Hub cash price – the American benchmark – has increased by just 150% over the same period. The difference can be explained by the regional segmentation that characterizes natural gas markets that, unlike oil, are only partly shaped by global forces – and, for this reason, also their correlation with oil prices is relatively weak.

Since one MWh is equal to 0.59 barrels of oil in terms of energy intensity, assuming a EUR-USD exchange rate of 1.16, the current Dutch TTF prices are equivalent to oil prices of USD 175/bbl, beyond the highest ever market price for oil. Such high gas prices, if persisting, risk denting the recovery, hitting real disposable household income and impairing the production of energy-intensive goods. Some production relies on the direct combustion of natural gas, such as the manufacture of ethanol, aluminum, and a variety of chemicals. As a direct result of the current high natural gas prices, some fertilizer and other industrial facilities have already been forced to close in some European countries.

Oil prices also risk being affected as the two commodities are interconnected. Gas prices in some markets are contractually tied to oil prices. Moreover, gas and oil are at least to some extent substitutes, even if their degree of substitution varies sharply across countries. When it comes to production, they are either complements (coming from the same well, so-called association) or rivals (being produced separately, so-called non-association). Therefore, price differentials between the two commodities determine the allocation of drilling resources at the wellhead, favoring one energy source or another depending on market conditions. Finally, high natural gas prices increase the cost of processing heavier crudes, which require more processing and more conversion than lighter ones, and so more energy, thus pushing up oil prices too.

In order to understand how oil prices might be affected by spillover demand coming from the natural gas market, it is important to recap the factors that are currently affecting the latter. Ultimately, oil can only partly mitigate the natural gas shortage for two reasons. First, oil can only replace a small share of natural gas in the production of electricity. Second, for now, after its latest review meeting, OPEC+ does not appear ready to intervene and accelerate its tapering of previously agreed productions cuts in order to contain the fallout from the lack of natural gas. Therefore, there are substantial upside risks to our Brent spot price forecasts, which were predicated on a shift from an under-supplied market to an over-supplied one, leading to prices already falling below USD 70/bbl in 4Q21.

CHART 1. SURGING NATURAL GAS PRICES



Source: Bloomberg, UniCredit Research

Factors behind the energy crunch

According to the International Energy Agency, natural gas is the cleanest-burning and fastest-growing fossil fuel, contributing almost one-third of the growth in total energy supply throughout the last decade. It is primarily used for power generation and as a source of heat for industry and buildings. In the US, it is the largest source of electricity generation, accounting for about 40%, while in EU-27 this percentage is close to 25%. The share of coal, nuclear and renewable sources in the production of electricity account for around 20% each. Oil plays a residual role, generating around 1% of electricity in both regions.

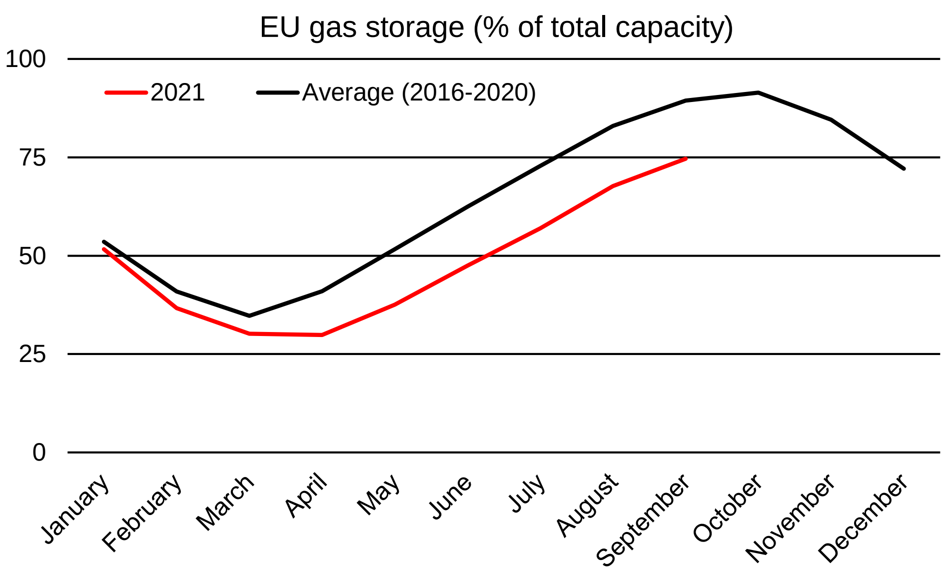
There are both long and short-term supply and demand factors that are currently weighing on gas prices. The rebound in industrial activity across the world following months of COVID-related restrictions and widespread remote working – along with a long, cold winter in Europe and summer heatwaves in Southern Europe, the US and certain parts of Asia that increased the use of air conditioning – boosted demand for natural gas. Moreover, in Europe, rallying carbon prices have fostered a switch from coal to gas in recent months and low wind generation across European countries has boosted demand for gas. Finally, gas, being relatively clean compared to other fossil fuels, is also one of the pillars of the energy transition: it is the only fossil energy source which is projected to grow until 2050 – a period during which demand for both coal and oil is expected to peak – and it is likely to play an especially important role in developing economies, where the share of coal in the energy mix is currently high and overall energy demand is growing strongly.

On the supply front, bottlenecks are increasing. In the US, production of natural gas is struggling to return to pre-COVID levels. Last August, the number of rigs in the Appalachian region amounted to 40 – half of what was the norm in the years before the pandemic when, thanks to the fracking revolution, American producers were the main engine of growth in the supply of natural gas. Moreover, Russia has limited exports of natural gas to Europe because of high domestic demand, output disruptions and rising demand for liquified natural gas from Asia, with China trying to secure large supplies ahead of the winter. Several Chinese provinces are already rationing electricity to some industries.

Russia may also be limiting natural gas delivery into Europe to unlock flows via Nord Stream 2 (NS2). Although work on the pipeline was recently completed, the German regulator has not certified it yet. The activation of this pipeline could be further delayed by additional bureaucratic hindrances. In late August, a German court ruled that NS2 is not exempt from EU competition rules, which implies that the operating company must unbundle its business as these rules prohibit gas suppliers from owning pipelines. On top of this, the whole project is at the heart of unresolved geopolitical disputes, with the US opposing it on the ground that it risks isolating Ukraine and threatening its security. Even without these obstacles it is unclear how much Russia would be able to increase its supply at short notice.

As a result of tight supply and rising demand competition between Europe and Asia, storage levels are critically low. Chart 2 shows gas storage as a percentage of total capacity for Europe, showing that it is well below what it used to be. All of these factors have prevented European countries from building up sufficient inventories in time to face the winter.

CHART 2. LOW INVENTORIES



Source: Gas Infrastructure Europe, UniCredit Research

Implications for oil

A possible response to a shortage of natural gas is to replace it with oil, particularly for the generation of electricity. However, there are several impediments. First, as we have discussed several times in past notes, the oil market remains highly undersupplied and yesterday's decision by OPEC+ to stick to its current tapering process has not brought any relief. Second, and more importantly, oil plays a marginal role in the production of electricity and the degree to which plants can be converted is limited. For example, approximately 18% of natural gas usage in the US can be switched to petroleum products. The Middle East and Asia are better positioned to temporarily increase the use of oil-fired plants: the Asian power generation sector currently uses around 900kb/d and has around 550kb/d of unused oil-burning capacity. Third, gas-to-oil switching in Asia is also easier than in Europe due to less stringent environmental regulations and lower carbon prices.

Therefore, oil is unlikely to be the solution to the natural gas crisis. However, its prices might be positively affected for a number of reasons. First, the replacement of gas with oil, where possible, might lead to an increase in global oil demand of about 1mb/d – more than twice as much as the number of additional barrels that OPEC+ will inject in October. Even if higher natural gas prices had a negative impact on economic growth, thus lowering oil demand somewhat, the balance would likely still be positive. Second, arbitrage opportunities for switching extraction between the two commodities might favor gas over oil, thus partly reducing oil supply, while lifting prices. Third, the overall uncertainty that the gas crisis might trigger in financial markets might support oil prices through the confidence channel. However, this scenario of higher oil prices should not be seen as a vindication of super-cycle theories that, at the beginning of the year, predicted a sharp rise in oil prices. According to those arguments, buoyant demand was the key factor, whereas at the moment it is artificially low supply that is driving prices.

Ultimately, the current natural gas crisis is related to dynamics specific to the gas industry and can be solved only within the industry itself. It is also the result of incomplete political choices. Europe remains heavily dependent on Russia for its natural gas needs and, while the energy transition is accelerating across the world, the necessary infrastructure appears to be lacking. Unfortunately, none of these issues are likely to be solved in time for the winter.

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