

Prospects and Challenges for Global Natural Gas Market

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Abstract: The rapidly evolving COVID-19 crisis presents profound challenges for the global natural gas industry, as it does for the energy system as a whole and the economy at large. While LNG prices are collapsing due to oversupply and poor demand, US natural gas production and LNG exports may decrease for the first time in a decade. Major Russian gas projects, like Power of Siberia, Turkish Stream, North Stream 2 will increase its exports and competition on China and EU markets. US-China trade war is affecting US exports of LNG to Chinese market, while coronavirus pandemic affects industrial activities and global demand for natural gas. In Europe the influence of mild winter, pandemic and LNG oversupply was obvious and prices have decreased during the first four months. Traditional LNG exporters, such as Qatar, or Middle Eastern producers/exporters were hit by the large surplus on the market and some LNG projects will be postponed. Any demand and price recovery depends on the speed and amplitude of economic recuperation within the global economy. Romania will try to exploit, use and export the important off shore gas reserves, estimated at 200-300 TCM. Taking into considerations all mentioned above, our research has as main objective to presents the major challenges for the future evolution of natural gas market while depicting the main drivers of those challenges. The methodology used is based on an empyrical analysis using both latest international statistics and relevant case studies.

Keywords: natural gas, predictions, coronavirus pandemy, LNG

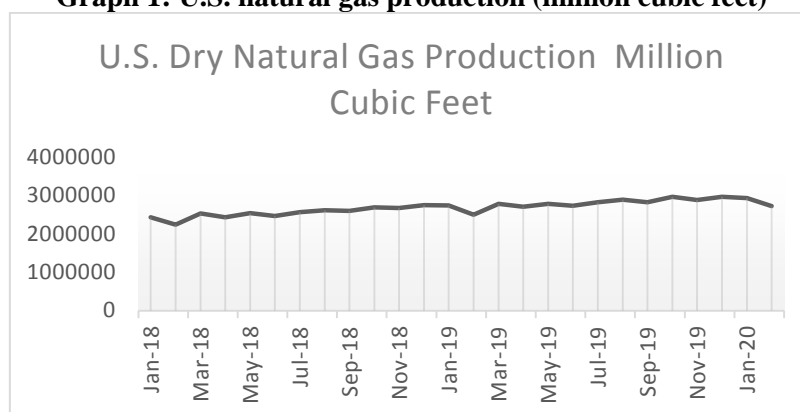
JEL classification: Q11, Q31, Q43

1. U.S. natural gas situation

1.1. Natural gas production

U.S. natural gas production may be reduced for the first time. Apart from a back-up during the 2016 market crisis, U.S. natural gas production has increased in the last decade. This upward trend may be nearing its end as prices have reached less than \$2/mil. Btu.

Graph 1: U.S. natural gas production (million cubic feet)



Source: Authors based on U.S. Energy Information Administration (<https://www.eia.gov/dnav/ng/hist/n9070us2M.htm>)

Global LNG prices are collapsing. LNG prices are on track to reach their lowest level in Asia this summer. Natural gas is also experiencing its weakest season in the US and Europe since the late 1990s. "There is a supply surplus already in the US and Europe. And the mild winter in Asia means another surplus that is being made there," Marco Dunand, chief executive of the Meraria Energy Group Ltd., told Bloomberg. Torbjorn Tornqvist, chief executive of Gunvor Group Ltd., said the U.S. LNG exporters are 50 cents away from blocking the business.

Two new major Russian gas projects are already completed, Turk Stream and Power of Siberia, and the third, North Stream 2 through the Baltic Sea is in the advanced phase of completion. China is already connected to gas fields in Turkmenistan through a pipeline with a capacity of 55 BCM per year. China's northwestern region bordering Siberia is a major producer of crude oil and gas. Putin is trying to lure Mongolia into another project of a large gas pipeline to China.

1.2. The U.S.-China Trade War

Despite the fact that U.S. President Donald Trump declared from Switzerland a truce between the U.S. and China in the trade war that has been going on for more than a year, we should not expect to see rapid economic change. The problem, as explained in the article entitled "Trump's Phase I with China will not undo the damage to the trade war", is that the positive results of the agreement remain on paper in the future, while the damage caused by the US - China trade war will continue (Griswold, 2020).

Moreover, the 'Phase I' of the end of the trade war is only an initial phase, not a lasting change. In fact, Trump remains in his position that his high tariffs for China are a good policy. The president said in Switzerland that "these achievements would not have been possible without the implementation of the taxes. And the taxes will be used also for other products. This is why most of our taxes for China will remain in force during the "Phase II" negotiations.

It is not only US tariffs for China that will remain in place, but also Beijing's tariffs on the US. "The Phase I agreement maintains both U.S. tariffs on imports from China worth \$360 billion and Chinese tariffs on more than half of U.S. goods exported to China," reports The Hill. "These tariffs are an open wound to the United States economy."

At the same time, China continued its efforts to strengthen domestic energy production in order to decrease dependence on imports to ensure energy at national level. Beijing is currently preparing for a major revival of the energy sector, facing growing pressure to increase energy production. "The managers of Chinese energy companies are ready for a revival of the energy sector, as steps are being taken to reorganise management and energy infrastructure," Bloomberg reported in early April 2020. As part of an effort to strengthen production, last week Beijing "opened its sector for extraction from abroad, and last month it drew up plans to move pipelines to a new firm that would allow more companies access to energy infrastructure."

In addition, China's largest oil company, China National Petroleum Corp., and the major refinery Sinopec have announced major changes. China "intends to boost shale gas production in Guizhou", while next year shale gas mining will be slowed in the US, where the country's "shale revolution" is beginning to diminish. Officials in southwest Guizhou province announced an "ambitious plan to develop local shale gas resources over the next five years", by drilling more than 80 new wells "to achieve an annual production capacity of 2 billion cubic meters by 2025".

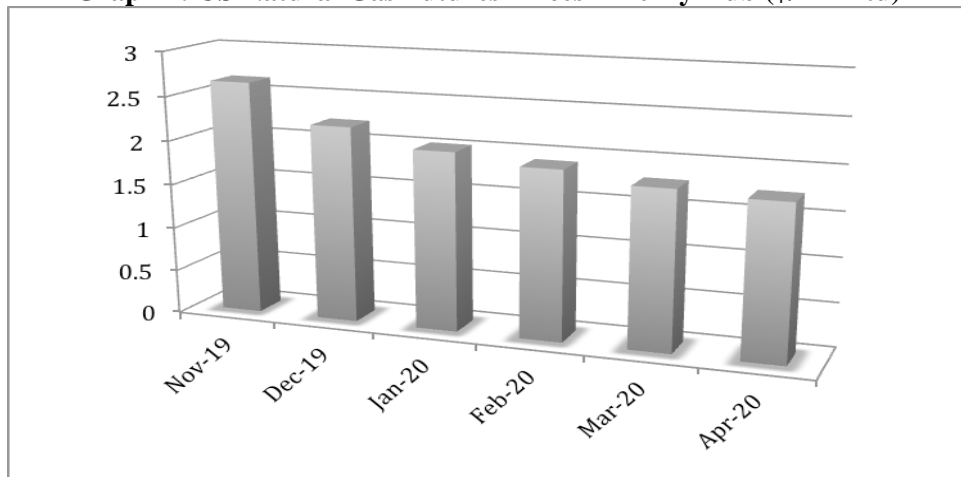
As an additional blow to U.S. shale gas, the recent trade agreement between Beijing and Washington does not mention the reduction in Chinese tariffs on U.S. energy imports, which are currently set at 5% for oil and 25% for liquefied natural gas (LNG). China, however, agreed to import more U.S. fuels.

As the New York Times headlines, "as part of the agreement, China has committed to purchasing dozens of American fuels of all kinds this year and future worth billions of dollars. But the entrenched public perception is that both the Trump Administration and China are still manoeuvring to gain the advantage. As China and Beijing are competitors to gain an advantage, there are many risks to the economies of both nations and to the massive workforce employed in the energy sector."

1.3. The influence of the coronavirus pandemic

Overproduction, low demand and low prices: these elements describe the natural gas market at the moment, as well as the oil market. Unfortunately, given that the outbreak of coronavirus in China has become global, the situation in the natural gas market may worsen before it improves (Oil and Companies News, 2020). And while the oil market is suffering, at least it benefits from the fact that it has a cartel that can try to balance things out. In the case of natural gas there is no such cartel, which is an even greater disadvantage.

Graph 2: US Natural Gas Futures Prices – Henry Hub (\$/mmBtu)



Source: Authors based on U.S. Energy Information Administration (https://www.eia.gov/dnav/ng/ng_pri_fut_s1_m.htm)

The global oversaturated supply of natural gas is not a new element. A combination of new LNG capabilities and pipelines, and milder winters in some parts of the world, especially in the northern hemisphere, have oriented the market towards the oversupply that persists to this day. In addition, demand has decreased due to the coronavirus pandemic. In the United States, Henry Hub futures were at the end of April below \$2/mmBtu until July, when the futures price reaches \$2/mmBtu. According to Richard Soulanian, president of energy consulting company NUS Consulting Group, prices in the United States could fall even further, up from \$1.50-\$1.60 for near-month contracts, before they begin to improve in the last part of the year.

What could possibly support gas prices? Europe has natural gas deliveries secured in large quantities and so is Asia. The Energy Information Administration has forecast that U.S. gas stocks will hit a record at 589 billion cubic meters later this year, which would be up 12 percent from the five-year average.

Production shows no signs of slowing for the most part, as much of the United States's natural gas production comes from shale oil mining fields. There seems to be no way to raise prices, and this affects some gas producers and especially U.S. "upstream companies". A recent report by energy data provider Enverus "Rockies and Bakken in Focus" shows that many producers active in the two shale areas have production costs considerably higher than the reference prices, some greater than \$3/mmBtu. Unless things change quickly, this can lead to bankruptcy.

The transportation problem remains, although mitigation is expected with the construction of Permian's Kinder Morgan natural gas pipeline, which was established earlier in April. The pipeline will carry 2 billion cubic meters of natural gas to the Houston area. However, this will not change the situation of saturation in terms of domestic gas demand in the United States. According to Bloomberg, the world needs more gas-fired power generation capacity to recover gas prices. "Global prices are converging and by the time there are no new generation capacity built domestically and abroad, there won't be much space in the market," said Campbell Faulkner, data analyst at OTC Global Holdings. However, demand could grow earlier, at least in some parts of the world and especially in the U.S., according to NUS Consulting Group. An increased electricity consumption is expected in the summer season to provide some recovery for U.S. gas prices, the same with gas exports to Mexico, the country that is one of the largest buyers of U.S. gas. As demand grows, as its population grows, Mexico will remain an essential consumer for US gas surplus due to a lack of sufficient domestic production.

US LNG exports are also expected to grow this year, although "the U.S. LNG export capacity will continue to contribute to increased global demand for LNG, particularly in emerging Asian markets, as long as U.S. gas prices remain competitive," according to the EIA. Competitiveness is the rule of play in the LNG market, as all large producing countries feel the effect caused by the coronavirus epidemic. Those who trade a lot of energy resources with China, according to NUS Consulting Group, will feel a greater effect than those less dependent on Chinese imports. Also according to the EIA, US LNG will remain competitive until around 2030. However, buyers in Europe are already refusing the cargoes, that are too expensive, and this suggests a different reality at the moment. U.S. LNG producers plan to put more liquefaction capacity into operation.

Cancellations for cargoes cannot be a good thing for these plans. However bleak the gas landscape is at the moment, there is hope and this hope comes from oil prices.

"Covid-19 is causing crude oil prices to fall rapidly," Richard Soulanian told Oilprice, "which is likely to lead to a decrease in U.S. shale oil production from 2020 - which was originally foreseen - thus reducing some of the associated natural gas production." NUS Consulting Group believes that the natural gas market will not be rebalanced until mid-2021 due to the impact of the coronavirus pandemic on global supply patterns and demand. Without it, the market could have rebalanced by the end of this year or in early 2021, at the latest. This means that smaller U.S. producers, vulnerable to price changes, will have to bear an additional impact in one or even two stages. Big players, especially those supported by the state, such as Qatari or Russian companies, but also other major companies, are likely to emerge from this new gas crisis, largely slightly affected, but we may see bankruptcies in the US shale industry, unless a truly warm summer will lead to a major improvement in the demand for natural gas for electricity generation.

2 Natural gas situation in Europe

The International Energy Agency believes that a number of factors converge on the idea of evaluating the real potential of European gas demand in the short term, said the head of the agency's natural gas market analysis department (Zaremba, 2020). Jean-Baptiste Dubreuil, in an exclusive interview with S&P Global Platts, stated that the energy sector would be the only driver of increasing European demand in the coming months, as also in this sector hydrocarbons have faced increased competition from renewable sources.

The spread of the COVID-19 virus has led to a decrease in industrial activity in Europe, at a time when gas prices were already at their lowest levels in a decade due to an oversaturated global market and record LNG inflows, at a time when the end of the continent's heating season contributed even more to declining demand. As the heating season has ended and industrial and commercial activity is currently restricted, electricity generation would be the only sector for potentially increasing demand in the short term. But the potential is limited, as the share of heat production continues to decline with the development of renewables, while the switching from coal to gas at European level has already taken place on a large scale in recent years.

It has also been one of the mildest winters to date, affecting the demand for natural gas in the heating sector, and Dubreuil has been cautious about blaming the current landscape for low European demand for natural gas solely in the light of the impact of the coronavirus. Data on total consumption reported by network operators in Italy, Spain, France and Belgium show a decrease from 6% to 20% since the application of isolation, but, again, some of this would be explained by temperature factors.

Traditionally, a source of demand in the summer months in Europe is the storage sector, but after stocks were raised to record highs last winter, due to concerns about the Russia-Ukraine transit, the deposits remain full. According to specialists, storage offers less leeway than in previous years, as stock levels at the end of winter are higher than average.

In view of the reduction in global supply and potential demand, all producers and exporters could seek options to optimise the trade positions and create some operational flexibility in the short term. Eyes will be on Russia and Norway to see if there is any change in behaviour that could lead to a reduction in flows to Europe. Given that prices in Europe were below €8/MWh (\$ 2.50/ MMBtu) in the recent period, there is concern that the price for natural gas in Europe is high enough to cover marginal costs in the short term. Last summer Equinor of Norway significantly restricted its production in its Troll and Oseberg fields, hoping for higher prices later.

"In terms of supply, proving flexibility to balance the European market includes a wide range of factors," Dubreuil said. These include contractual flexibility (intra-annual and beyond the current year) and operational flexibility, such as maintaining and optimising production, he said. As far as Russia is concerned, in particular, the structure of its exports to the EU in the coming months will depend in part on customer demand. Independent of Russia's strategy as a long-term producer and exporter, its short- or medium-term flows to Europe will remain mainly driven by its long-term contractual commitments and will therefore fluctuate according to buyers' nominations under the flexibility clauses of their contracts.

Gazprom wants to keep its exports to EU and Turkish markets at around 200 BCM/year over the next decade and has other tools at its disposal to maintain market share. The main is its electronic sales platform (ESP), where Gazprom can place volumes that are not agreed through long-term contracts. The development of sales within the ESP - and direct sales at the price of the moment on hubs - shows Russia's growing role as a short-term supplier to Europe and its competitiveness for short-term buyers.

LNG has continued to come to Europe in large quantities since the beginning of 2020, then the

situation has escalated as a result of the collapse in China's import demand for LNG due to coronavirus. However, again, Dubreuil said that the mild winter could account for some of the decline. The end of this very easy heating season introduces a temperature-determined impact on heating demand, which adds additional complexity in assessing the impact of COVID-19 on consumption. While the virus had an impact on China's annual growth in gas demand in January and led to a decrease in February, industrial activity increased in March. Early estimates for March tend to show a return to growth, as the Chinese industry is gradually returning to normal activity.

LNG imports were constant in Japan, increased in South Korea and increased in several fast-growing markets, such as India and Bangladesh. However, most of these emerging markets in Asia appear to be in the early stages of COVID-19 development, having recently taken the first containment measures. Cheap LNG could continue to be an attraction for Asian LNG importers, especially to price-sensitive buyers in fast-growing markets. However, rapid market expansion also depends on a wide range of internal factors, such as access to regasification capacity, potential pipeline network bottlenecks, downstream market organisation and potential competition with locally produced sources.

While short-term market dynamics do not seem favourable, Dubreuil said the impact of COVID-19 would not "fundamentally" change the role of natural gas - and renewable gas - in the long term. "The development of hydrogen, biogas, etc. follows market objectives and medium- or long-term policies. It is again too early to say that COVID-19 will have a short-term impact on the investment programme for these projects, but if it should happen, it does not change the long-term reasoning behind these projects," Dubreuil said.

3 The LNG market

3.1. The LNG excess

Global LNG markets are struggling with an unprecedented surplus. Production expansion in Australia, Qatar, Mozambique and Egypt, combined with continued progress by the export of shale gas from the U.S., has further lowered prices. Analysts have previously warned that a possible surplus of LNG could have serious consequences, but no one expected the market to be affected by a shock from demand, such as that caused by the coronavirus outbreak. The main LNG producers, such as Qatar, Australia, Egypt, are already feeling the effects of this situation. During the "EGYPS2020" oil and gas conference in Egypt, participants expressed concern for the imminent future of the East Med gas hub, as no new LNG export contracts have yet been signed and the required prices are not likely to be obtained.

The announcement that Qatar delayed the election of Western partners for the world's largest liquefied natural gas project by several months will not go unnoticed. Without direct statements by Qatar Petroleum, sources said the delay decision was made on the basis of current market elements and given the still unclear impact of the Coronavirus outbreak. Qatar is fighting a sustained battle for its market share as the market has been saturated by U.S. shale gas exports and it has been recorded a drop in Chinese demand.

International interest in the expansion of LNG in Qatar was high, and among those interested were industry giants such as Shell and ExxonMobil. Qatar Petroleum (QP) has not published any list of stakeholders, but about six Western companies are believed to have shown interest. The market was waiting for QP to announce its partners in the first quarter of 2020, but this event will be delayed by the end of this year.

It is not only traditional LNG exporters, such as Qatar, or Middle Eastern producers/exporters such as Egypt or Algeria that are hit by the current surplus. U.S. shale gas exporters are still facing a major crisis. Dreams of entering strong, high-priced markets worldwide were destroyed because, due to the existing surplus of natural gas, prices fell. U.S. gas exports now only contribute to saturation, pushing prices further down.

Booming U.S. exports, combined with low demand from Asia, are an important recipe for disasters, affecting most companies, especially Shell, Total and ENI, as they all focus their own investment and expansion strategies to the natural gas sector. Some American manufacturers, such as Chesapeake Energy, are already struggling with bankruptcy, and companies have been hit by a drop in profits.

For Arab producers, especially Qatar, Algeria or Egypt, the future is uncertain. New natural gas discoveries will need to be monetized to support economic growth and diversification plans. Current expansion plans are needed for Qatar, not only for new exports, but also to keep investors and international operators interested in Qatar's success story. Algeria, at the same time, is moving to other routes to get extra money to support its developing economy for years to come. The strategy for the Energy Hub in Egypt, in cooperation with Cyprus and Israel, is a matter of life and death. International cooperation and investment strategies are needed to develop the regional economy. Without markets or customers everything will be frozen, because no

investor or company will be willing to spend another \$10 billion on a possible new 8 million-ton LNG convoy. In the case of Qatar, the planned expansion is about \$60 billion.

Today, all eyes are on China, as the Asian giant has accounted for 40% of the global growth in LNG demand since 2015. The expansion strategies were adopted in view of the fact that demand forecasts for China will exceed 82 million tonnes/year by 2023. The same was expected, at lower volumes, for India and possibly for other areas of Asia and even in Europe. The current situation and effect of the coronavirus pandemic have questioned all this. A main concern will be that surplus LNG could get out of control, pushing major operators to uncertain areas (Rystad Energy, 2020).

3.2. Shell forecast

According to information published by Shell in its last forecast for 2020, the increase in supply of liquefied natural gas (LNG) on the world market is expected to slow down by the end of this year and in 2021, when the last of the new projects currently under construction will be completed (Paraskova, 2020). Starting with the second half of this year, Asia will absorb excess supply, and Europe will cease to be the "balancing market" in absorbing the growth of supply coming from new projects in the US and Australia, according to Shell, which is a major player in the LNG trading market." Europe has absorbed the majority of the increase in supply in 2019, as competitively priced LNG favoured the shift from coal to natural gas in the electricity sector and replaced the decrease in domestic gas production and gas pipeline imports," Shell specialists said. LNG imports from Asia increased modestly in 2019 compared to previous years due to milder winters and increased nuclear power generation in major LNG import countries in Asia, Japan and South Korea, Shell said. In the spring of 2020, LNG prices reached the lowest level in a decade, due to warmer winter in many parts of Asia, rising LNG supply and lower growth in China's imports. In April spot prices for LNG in Asia fell to a new low of \$2.70/MMBtu - decreasing due to low demand in China amid the outbreak of coronavirus, industry sources told Reuters.

"While at the moment we are seeing weak market conditions due to the increase of supply, two successive mild winters and the Coronavirus epidemic, we expect to return the balance, driven by a combination of continued growth in demand and the reduction of new supply by the mid-2020s," Maarten Wetselaar, director of natural gas at Shell, said in a statement. In the longer term, Shell expects global demand for LNG to double to 700 million tonnes by 2040.

3.3. The impact of coronavirus pandemic on LNG market

The global natural gas market was already oversaturated at the beginning of Spring 2020 due to relatively modest demand and declining prices amid a mild winter in the Northern hemisphere. The pandemic has created an unprecedented situation that has made things worse. And while analysts still expect cargo ships to be loaded to levels close to normal in the coming months too, global stocks could be reduced by an early autumn.

At the beginning of the year Europe took over excess cargo ships to China when the viral epidemic first broke out in China and Eastern Asia, but demand has narrowed significantly on the continent since mid-March with the spread of the Coronavirus. India was the opportunistic buyer, but the government closed the country for 21 days from the end of March, aggravating the problems for the LNG market. "Another thing that affects the market is that India tends to be very price sensitive and buys a lot of LNG when prices are low," said Kristen Holmquist, director of Poten & Partners. According to Kpler, India's LNG imports reached a record of 2.75 million tonnes in February, when a number of cargo ships were redirected there from the Far East. Demand for natural gas in India has been growing rapidly, driven mainly by its increase in the residential and commercial sectors, with LNG accounting for more than 50% of the country's gas consumption. The largest number of contracts with India are provided by the producers of LNG in Qatar and USA.

The number of floating LNG vessels worldwide has increased again, as happened in mid-February, when China was battling the outbreak of infection. The number of ships on water is an indication of global demand because ships are trying to find a buyer or waiting for prices to rise. Major buyers in India declared force majeure in early April for losing labour to unload ships and facing declining demand due to the country's closure. Kristen Holmquist said the invocation of force majeure was denied. "What we have seen is that instead of accepting force majeure, suppliers are working with those countries to temporize or delay cargoes and also to find a short-term solution," Kpler said.

The coronavirus pandemic continued to push prices down, in Europe and Asia. Since the beginning of the year, Dutch Title Transfer Facility and Japan Korea Marker have fallen by 44% and 57% respectively,

according to a Goldman Sachs analysis from mid-April which underlined that "we will now see that U.S. LNG exports will be unprofitable for most of the summer." While in the US LNG capacity closure is becoming a probability, as storage capacity in Europe has started to fill up since the end of last year, a more robust response from LNG bidders may be necessary from other producers if the market continues to deteriorate. "At that point, we may start to see more extreme needs to stop LNG production in locations where no capacity closures have occurred."

4 Global Natural Gas Market Forecasts

Rystad Energy claimed in its latest report in April 2020 that natural gas would continue to feel the shock triggered by coronavirus for many years to come. Global gas demand is affected by the Covid-19 pandemic, and Rystad Energy estimates that, although they will not be reduced to the same extent as crude oil, international gas prices will reach lower averages in 2020 than previously forecast. Prices had already fallen due to the abundance of liquefied natural gas (LNG) on the market and it will take years for the pandemic effect to dissipate completely (Paraskova, 2020).

Prices in Europe (TTF) for 2020 are now forecast at \$3.2/MMBtu, a decrease of \$0.62/MMBtu from the February forecast. Similarly, the forecast for spot prices in Asia was revised to \$3.80/MMBtu. The lower forecast is based on weaker demand at the global level throughout the year as a result of lower trade and industrial activity, which will exacerbate market weakness. Price forecasts for 2021 and 2022 have also been revised on the basis of lower economic growth and significant LNG supply. In view of the recent collapse in oil prices and Rystad Energy's downward revision for the oil price forecast, the price indexed with crude oil has also been revised.

Given the six-month gap in oil price indexation in most long-term contracts, the indexed oil price is expected to reach a level of \$5.68/MMBtu in 2021, which is \$1.05/MMBtu below the previous forecast (-16%). The US gas prices in Henry Hub are also expected to remain below \$2.5/MMBtu for an extended period, at an average of \$1.94/MMBtu in 2020 and \$2.43/MMBtu next year.

Rystad Energy expects the fundamentals of the global market to remain the same until 2022, but rising LNG demand could exceed liquefaction capacity due to more delays in starting projects. Rystad Energy forecasts a balance of the LNG market in 2024 and 2025 and, with it, an increase in prices. After this period, we may see a downward trend in risk for 2026 and 2027 prices, driven by potential excessive investment in 2019 as new deliveries begin to enter the market. However, the downward trend in prices during that period may be more limited than previous estimates, as the smaller number of liquefaction projects taking place will help to maintain a better balance in the market.

Much of this year's demand losses come from limited appetite for LNG, with buyers reducing orders amid reduced industrial and trade activity and excessive offers, as low prices sometimes make transport inefficient. As a result of lower demand and lower prices, exporters have had to adjust their LNG production, and the US is among the countries that will feel the greatest impact on LNG exports. The raw material supply of liquefaction facilities on the US Gulf Coast has slowed in the past two months, with part of the gas being redirected to domestic consumption, where the shift from coal to natural gas in the electricity sector is observed. The amount of natural gas subject to liquefaction peaked at 269 million cubic meters/day on 31 January and has seen a decreasing trend since then, with an average of 224 million cubic meters/day in March. The amount of natural gas that was liquefied at the Sabine Pass LNG terminal decreased from 120 million cubic meters/day on 31 January to 49 million cubic meters/day on 17 March.

"While US LNG exports fell, demand in the electricity sector continued to rise in March, fueled by low gas prices. US gas demand in the electricity sector has recently reached almost 900 million cubic meters/day, an increase of 30% compared to last year. However, as the Covid-19 epicenter moves from Europe to the US, there was a decline in demand for natural gas from the electricity and other sectors, adding pressure on Henry Hub prices" said Carlos Torres- Diaz, director of Rystad Energy for the natural gas and electricity markets.

In terms of production, in the US, gross natural gas production is expected to decline from 3.28 billion cubic meters/day in the fourth quarter of 2019 to about 3.05 billion cubic meters/day in the same period this year. It is estimated that in a WTI crude oil price scenario of \$ 30 /barrel (the price falling below \$ 15/barrel in the second half of April), Permian gas production could fall by more than 11 million cubic meters/day (expressed in dry gas), just before the end of the year, and may decrease by another 28 million cubic meters/day in the period 2021 – 2022, if crude oil prices do not recover. Although this rate of decline may not seem significant, it is a big difference compared to the initial growth expectation of 113 million cubic meters/day for the period 2020 – 2022.

Permian and Whistler pipelines will most likely become operational and achieve adequate utilization rates, but the use of old pipelines and the need for future projects are now in jeopardy. Lower natural gas production from associated wells could help balance the market and push Henry Hub prices back to \$2/MMBtu by the end of the year.

5 Conclusions

Natural gas is a resource closely linked to crude oil, with which it competes and to which it relates to the pricing of long-term contracts, usually indexed to the price of crude oil/fuel and Diesel oil. The decline in prices in 2019 and especially in 2020 will have significant effects on supply, in the medium and long term, while balancing the supply/demand ratio in the global market will take at least a few years. Natural gas has been established as an important substitute for coal and oil, which are much more polluting resources, but it also feels the competition of renewable energies. Transport projects developed by Russia, through large pipelines and liquefaction projects in the US, Australia and Arab states have favoured the global expansion of natural gas, temporarily hampered by the crisis triggered by the Coronavirus pandemic.

Romania has limited onshore reserves (100 billion cubic meters in 2017) and with significant offshore reserves (at least 200 billion cubic meters). Now, our country can also take advantage of the opportunity created by market condition for some imports of natural gas for storage in underground deposits, at the low prices in the second and third quarters, although resuming relations with Romania's traditional pipeline gas supplier, Russia, would be relatively difficult, but also of LPG (liquefied petroleum gas) in deposits in the Midia port. In recent years Romania has reduced its gas imports from Russia to a minimum, to almost zero. The average price of natural gas import contracts in Western Europe on 31 March 2020 was \$2.71/MMBtu (about \$94/1000 cubic meters), practically equal to the average import from Russia (\$2.7/MMBtu). Instead, Romania could exploit the possibility of importing gas from spot markets by interconnecting to European networks through the Hungarian-Szeged pipeline. In the EU spot markets (Baumgarten-Austria, Zeebrugge-Belgium) the natural price at the beginning of April was \$1.60/MMBtu (\$56/1000 cubic meters), with a downward trend, the lowest level in 25 years, both because of the crisis caused by the pandemic but also the very mild winter and the record supply of LNG from the US.

In contrast, Romania has a major advantage in the field of natural gas following the important discoveries made in the Black Sea continental plateau. The reserves in this perimeter are estimated between 200 and 300 billion cubic meters and would guarantee Romania long-term energy independence/autonomy and significant export through the BRUA pipeline, which is in the final stage of construction and financed by the EU. The fact that the new discoveries of oil and gas come largely from deposits that are increasingly difficult to exploit technologically, geologically and commercially, however, puts the governments of the countries holding these reserves in a position to make the regulations on the foreign investment regime more flexible in exchange for assistance in the exploration and production of their primary energy sources, and the extremely low prices of crude oil and gas further encourage this trend which is not to the benefit of resource holders. The economic, energy and geopolitical stakes of the exploitation of these reserves in the Black Sea are so great that it has generated extremely strong external political pressures from some states that have companies involved in the project, to which the state should not give up, but try to make the most of them properly, including through their use in petrochemicals and in the supply of the population.

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