

REKK POLICY BRIEF

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WHAT CAUSED THE 2018 MARCH PRICE SPIKE ON TTF?

■ In late February, an extreme phenomenon occurred on TTF, the most liquid European natural gas exchange: daily settlement price was peaking over 70 €/MWh, with hourly results as high as 150 €/MWh. The hike was unprecedented: most extreme weather, the 2012 cold spell produced daily settlement price of 40 €/MWh. In our short analysis we assess the possible reasons for such extreme market outcomes and consider whether this is the normal functioning of the gas market and are similar spikes to be expected in the future.

■ The highest price hike of the TTF before was the 2012 cold spell, when a two-week long period of freezing temperatures 10 degrees below the usual winter weather caused peaking demand all over Europe. Even though the cold spell lasted longer and temperature dipped far below -10 degrees Celsius, the price effect was more severe in 2018. (Figure 1)

■ Although the TTF serves as a universal price marker and the litmus of the European gas markets, it is still primarily a Dutch exchange, reflecting the supply and demand relationship in the Netherlands. Therefore we consider the decisive factors for the Dutch natural gas market:

- Domestic gas production in the Netherlands
- Availability of main suppliers of the Netherlands (Norway, Russia)
- Fill-up of the storages
- Availability of LNG
- Daily gas demand

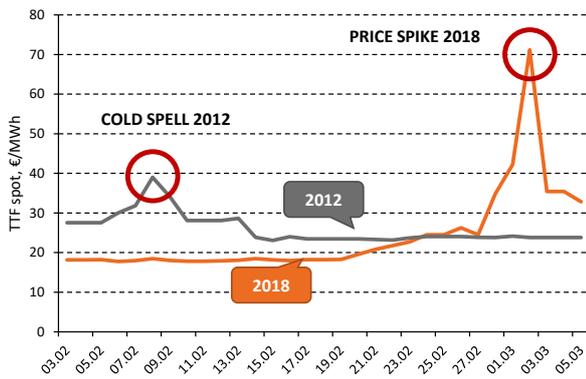


FIGURE 1. TTF DAILY SPOT SETTLEMENT PRICES
source: REKK based on PEGAS

LOWER PRODUCTION FROM THE GRONINGEN FIELD

The Netherlands is one of the greatest gas producer country in the EU-28. The Groningen gas field served the natural gas needs of the Netherlands from the 1960s, but due to the inevitable depletion of the source and concerns on earthquakes caused by the extraction activity, the Dutch government as of November 2017 set a 24 bcm/year on the production of the field. The Dutch production in 2012 supplied a steady 6 bcm/month to the market, while in 2018 this shrunk to a meagre 2 bcm/month. (Figure 2)

NO GAS IN STORAGES?

Low summer-winter spreads and more mature gas markets facilitated short-term trade and consequently the limited use of storages to 2018. Fill-up rate has never been so low in the Dutch storages: by the time of the cold snap, only 20% of the total working gas capacity was in store. In the 2012 cold spell, storages were over 80% full. However, at even such low working gas reserves, storages performed exceptionally good: withdrawal increased 400-600 GWh/day, providing over 40% of the peak demand. (Figure 3)

DEFAULTS IN NORWEGIAN PRODUCTION

REMIT regulation requires Norwegian producers to publish availability of all the fields on the Norwegian Continental Shelf. A few days outage of three major producing areas

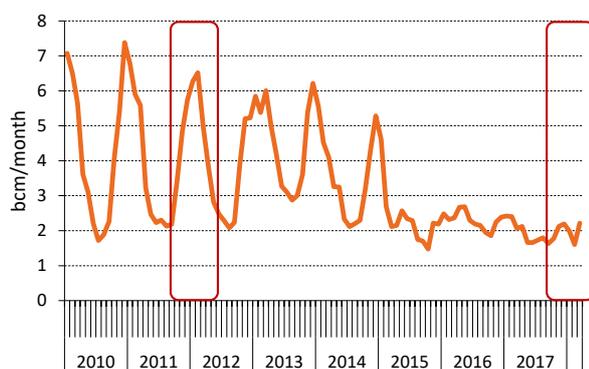


FIGURE 2. NATURAL GAS PRODUCTION IN THE NETHERLANDS
source: REKK based on NAM

(Kollsnes, Visund and the entry point to the SEGAL system) from 28.02.2018. accounted for the loss of nearly 30 MSm³/day (~300 GWh/day). Surprisingly, the outage was reported after the occurrence of the event, allowing for limited reaction by traders.

LNG TO THE RESCUE?

A possible source of flexibility besides storages is the Gate LNG terminal. A cargo of Russian gas from the Yamal peninsula, which was to be re-loaded, was fed into the system. At the peak days, 120 GWh was injected to the system, which made up 3% of the total demand. We saw no quick adjustment of the LNG markets: no other ships arrived, corroborating the notion that for short-term flexibility, LNG has limited option.

STOCKHOLM ARBITRATION - PANIC ON THE TRADING FLOOR?

Besides the fundamental factors, it must be noted that the rulings of the Stockholm tribunal, which was resolving the dispute of Gazprom and Naftogaz, were made public on 02.03.2018. The court ruled in favour of Naftogaz, making Gazprom pay a reparation of 2.5 Bn Eur. As a result, Gazprom announced that all Russian transit contracts via Ukraine would be terminated as fast as possible. Traders might have interpreted this as a warning sign and started procuring higher volumes.

"The Stockholm arbitration, guided by double standards, adopted an asymmetric decision on our contracts with Naftogaz of Ukraine regarding supply and transit of gas. The decision seriously violates the balance of interests of the parties under these contracts. The arbitrators ground their decision by the fact that the situation with the Ukrainian economy has drastically worsened. We are totally against the situation when Ukraine's economic problems are solved at our expense. In this situation, the continuation of the contracts' validity is not economically feasible and unprofitable for Gazprom."

Gazprom to cancel contracts with Ukraine's Naftogaz

TASS Business & Economy, March 02, 16:41 UTC+3

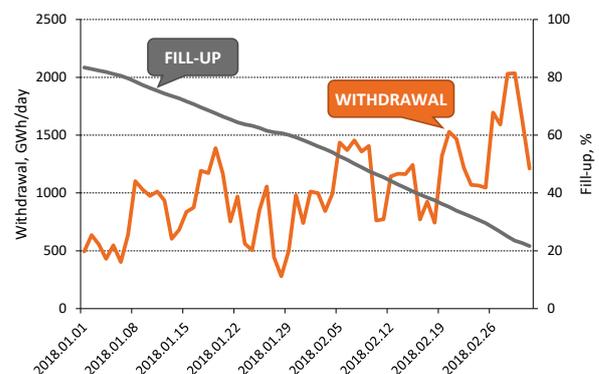


FIGURE 3. DAILY WITHDRAWAL AND FILL-UP RATE IN DUTCH UGS
source: REKK calculation based on ENTSOG

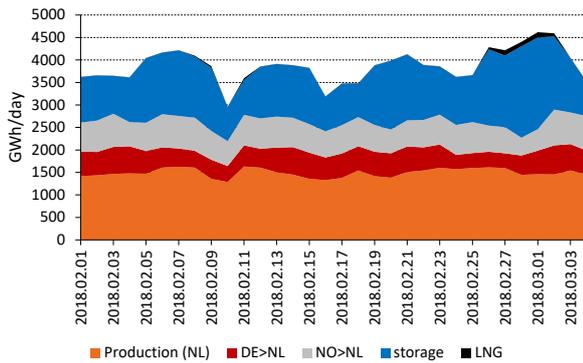


FIGURE 4. SUPPLY STRUCTURE IN THE NETHERLANDS, GWH/DAY
 source: REKK based on ENTSOG

ONE BY ONE OR ALL AT ONCE?

These shocks might not have caused a major effect on the gas price on their own, but the joint effect may have caused the peak. However, a broader coverage is needed for the full understanding of the story: gas price on the NBP was even higher, suggesting that the peak originated from the UK. In the summer of 2017, the Rough storage facility, which provided most of the winter flexibility for the UK was decommissioned due to financial reasons. Consequently, winter flexibility and peak demand needs were to be supplied by the major pipelines (the Interconnector and BBL). However, a strong winter and the outage of the Norwegian fields in tandem proved to be too strong shock for the market: curtailment of the gas-fired plants was enacted, but prices skyrocketed. Physical capacities were congested both at the BBL and Interconnector. (Figure 4)

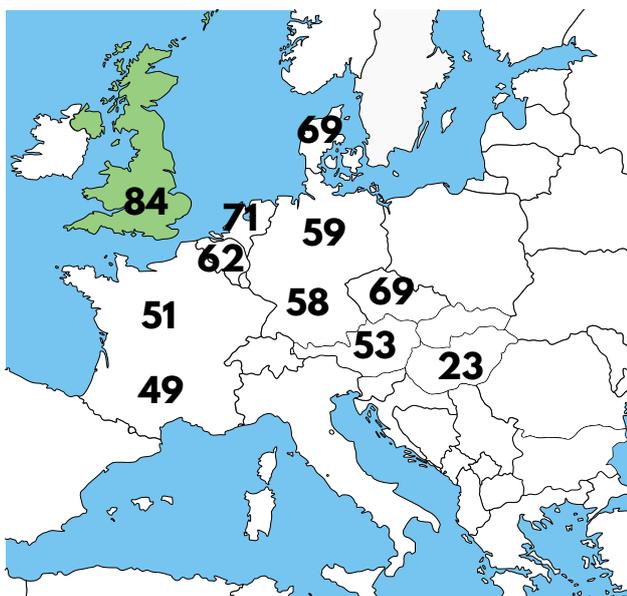


FIGURE 5. DAILY SETTLEMENT PRICES ON MAJOR EUROPEAN GAS EXCHANGES ON 01.03.2018., €/MWH
 source: PEGAS, CEEGEX

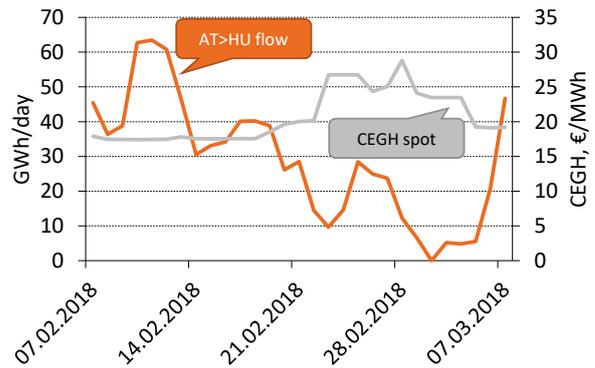


FIGURE 6. DAILY SETTLEMENT PRICES ON CEGH (€/MWH) AND PHYSICAL FLOW ON THE AT-HU INTERCONNECTOR TO HUNGARY (GWH/DAY)
 source: PEGAS, FGSZ

GAS DRIVES POWER OR POWER DRIVES GAS?

Not surprisingly, the gas sector peak coincided with an electricity sector peak: at the UK day-ahead market, daily settlement price was above 100 €/MWh, and this peak spread to other exchanges as well. One might wonder if the power sector demand was driving the gas prices or the high gas price was driving the electricity prices? When considering the relevant market to answer this question, the relevant geographic market and the relevant part of the power generation must be considered. The relevant geographical market is the locus of countries where the price spike in the power sector occurred, ie. DE, AT, LU, BE, NL, FR, UK. The relevant demand for gas demand in power generation is the total load sans nuclear and renewable generation - ie. any potential fossil fuels. After netting, we see no exceptional consumption during the peak days, so the peak originated from the gas market and had effect on the power sector.

MEANWHILE IN OTHER EXCHANGES

The peak spread across the major organised gas markets of Europe (NBP, TTF, ZTP, ETF), with somewhat less severe effects (PEG Nord, PEG Sud, Gaspool, VTP, CEGH, NCG). (Figure 5) However, the Hungarian gas exchange CEEGEX was unaffected. The reason for this was the limited trading opportunities of exporting gas from the Hungary - the Austrian-Hungarian interconnector is uni-directional, it is possible to export gas only via backhaul capacities. Inflow of gas from Austria to Hungary was practically zero on 01.03. (Figure 6) The other option to reach the lucrative western markets was via Slovakia. Unfortunately, the bidirectional SK-HU pipeline needs at least 2 days of technical work to allow the transmission of gas from Hungary to Slovakia. By the time this option was made possible, the price hike disappeared. Some traders were rumoured to export gas via the Ukraine to Western markets.

SUMMARY AND CONCLUSIONS

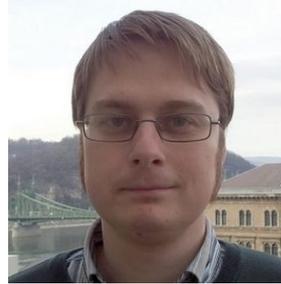
To sum up, the TTF peak was caused by a number of factors, but primarily by the freezing cold in the UK and the region, falling out of Norwegian production, and the lack of Rough storage in the UK system. Price hikes of this sort are more likely in the future, as import dependency will be more severe in Europe. Still, we consider such extreme events as the interplay of the supply and demand on the gas market. Price hikes serve as a healthy signal for traders, and were they more frequent, they would indicate the need for more infrastructure. The NBP price hike might speed up investment into transmission capacities between mainland Europe and the UK.

Changing of gas flows provided unique testing opportunity of the Hungarian gas system, with mixed results. Storages proved not only in the Netherlands but also in Hungary, that even at the end of the winter they can provide the highest technical withdrawal rates if necessary. We learned that the Hungarian gas system can survive for a few days without any inflow from the west. Still, the excellent trading opportunity and the storage potential of Hungary could not be utilized at the maximum potential, as the Hungarian-Slovakian interconnector turned out to be bidirectional only with a long lead time. Trading in a well-developed and volatile market requires better service from the transmission side. The Hungarian market was not coupled with the other European exchanges, due to physical constraints. We suggest re-fitting not only the Slovakian-Hungarian but also the Ukrainian Hungarian interconnector to allow for actual (firm) bi-directional gas flows.

REKK FOUNDATION

The goal of the REKK Foundation is to contribute to the formation of sustainable energy systems in Central Europe, both from a business and environmental perspective. Its mission statement is to provide a platform for open-ended, European-wide dialogue between government and business actors, infrastructure operators, energy producers and traders, regulators and consumers, professional journalists and other interested private entities. The REKK Foundation develops policy briefs and issue papers with forward-looking proposals concerning challenges posed by energy and infrastructure systems and organizes regional forums allowing stakeholders to become familiar with the latest technological and regulatory developments within the industry.

AUTHORS



Péter Kotek graduated in 2009 at the Corvinus University of Budapest as an economist, majoring in market analysis. He joined REKK in the same year as a research associate. From 2015, he is working as a senior research associate. His areas of interest are ancillary services market in electricity, LNG and gas storage markets regarding gas markets.



Borbála Takácsné Tóth has worked with REKK since its creation in 2004. In 2001 she received an M.A. in International Relations and European Studies at the Central European University in Budapest. She spent 5 years as a civil servant in government administration mostly in the field of energy regulation. With REKK she has been leading several international and national consultancy projects, with many using the European Gas Market Model as the primary analytic tool. Her main fields of expertise include: regional co-operations; security of supply issues; energy geopolitics; major infrastructure initiatives in the gas sector and incentives for investments; competition cases in the gas market; and the effect of gas release programs on competition in the gas market in Europe.



András Mezösi is a Senior Research Associate at the Regional Centre for Energy Policy Research. He received PhD from the Corvinus University of Budapest in economics in 2014 and graduated from the Corvinus University of Budapest in Economics in 2006. He joined REKK as an intern in 2005, since then he has become a senior researcher working on projects related in renewable energy markets, renewable investment analyses, emission trading and electricity market modelling. He participated in several projects related to energy economics of buildings, including modelling the energy consumption of residential buildings. He also investigated the regulation of renewable energy sources in Hungary and also in the wider region.

Further information: www.rekk.org

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