



The Gas Value Chain Company GmbH

Nord Stream 2 caught between politicization, hypocrisy and ignorance: a few inconvenient truths

Both U.S. sanctions and EU regulation obstruct climate efforts and pose risks to security of supply

by

Wolfgang Peters

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Executive Summary

- The Nord Stream 2 pipeline ('NS2') is caught between politicization, hypocrisy and ignorance.
 - The U.S. NS2 sanctions are an entirely unacceptable extra-territorial interference in European energy policy. While claiming to 'protect' their allies, they are running a, in the face of a meanwhile global gas market entirely unnecessary, U.S. LNG sales campaign.
 - The amendment of the Third Gas Directive is no doubt a discriminatory 'Lex NS2'. While NS2 opponents assert Russia might use gas as a political weapon, it is the EC using *regulation* as a political weapon.
- NS2 opponents qualify gas carried by NS2 as 'molecules of malign influence' (the U.S.) and as the Trojan horse by which the Russian president could exercise political blackmail (the European opponents). A few 'inconvenient truths' reveal hypocrisy and ignorance:
 - Continued transit through Ukraine, albeit also carrying molecules of the very same Russian origin, saw strong political support.
 - The rise of Russian LNG, meanwhile ranking no. 4 globally and supplied to Europe in large quantities, is not taken issue with.
 - Russian crude oil, its export rendering more than three times as much revenue as gas exports to Europe, is not sanctioned by the U.S. but instead *imported* in large quantities. Also European NS2 opponents conveniently ignore that Europe buys more than 30% of its crude oil imports from Russia.
- Both the sanctions and the ramifications stemming from the amendment of the Third Gas Directive obstruct European climate efforts.
 - Modern, state-of-the-art infrastructure, i.e. new pipelines and new, energy efficient compressors, such as NS2 features, contribute significantly to reduce the carbon footprint of fossil gas.
 - Even vs. the best LNG alternative (Qatar), 55 bcm/a carried by NS2 would save ~17.1 million tons of CO₂equ per annum and ~11 million tons vs. transit through the Ukraine.
- The tacit 'optimism' that NS2 will be completed and operational with only a minor delay poses an unnecessary risk to security of gas supply. The yardstick for a matter so important should be (achievable) certainty rather than optimism.
 - The current capacity arrangements, hinging on such optimism, are all 'stitched tightly on edge', i.e. do not cater for alternative capacity to speak of should the delay be longer. If there were another extremely cold winter (e.g. another 'beast from the

East') and Asian LNG demand were up at the same time, the unavailability of NS2 could result in a serious security of supply issue, causing prices to rise to the detriment of European consumers.

- Spare import pipeline capacity needed to provide a 'buffer' for seasonal swing in the heat market and volatility in the power generation space, previously provided largely by the Dutch Groningen field, has over the past several years diminished to critically low levels.
- In the past, Ukrainian transit capacity provided spare Russian import pipeline capacity even beyond the utilization of ~80 bcm/a in 2018/19. Now, the system is going to be reduced to 40 bcm/a. This eradicates, absent NS2, Russian spare import pipeline capacity in its entirety.
- The Yamal transit agreement will expire in May 2020 but 'nobody moves'. There is no certainty about its continued availability, if only used as a 'stand-by' facility with no long-term bookings generating revenues justifying the costs.
- With the Opal utilization restriction re-instituted by the ECJ, spare Russian import pipeline capacity would, even if NS2 were completed and operational, again be reduced to critically low levels if any. The EC could easily remedy the 'procedural flaw' perceived by the ECJ in a 'five minute repeat procedure' considering Poland. Since Poland's security of supply is neither affected by Nord Stream 1 (and Opal) nor NS2 (and EUGAL), the result would be the same as in the previous accord.
- Demand for gas is rising as a consequence of government imposed phase-outs of coal-, lignite and nuclear baseload power generation and, i.a., the transformation of the heat sector.
 - The postulate to disallow any further fossil gas entirely (and therefore also NS2) is a fallacy. The 'all-out-electric' ideology is unfit to bring the energy transformation about. Gaseous molecules are superior to electrons due to their higher energy density and thus pivotal to progress cost-efficient decarbonization. The degree of decarbonization correlates with the type of gaseous molecules deployed. Up to ~65% of decarbonization, fossil gas is enormously beneficial for battling climate change and improving air quality.
 - Previous conservative projections of the IEA saw European demand remaining flat at ~450 bcm/a. In a span of two years, these projections have been adjusted towards ~540 bcm/a, i.e. by almost a 100 bcm/a.
 - The increasing gas demand in the power sector due to imposed phase-outs is augmented and accelerated by market-driven coal-to-gas switching owing to low gas and high carbon prices.
- Import demand is rising ever more. Previous projections assumed flat demand and a continued gradual decline of indigenous production. Already then, an import need of

staggering 390 bcm/a was projected. Now we see significantly *rising demand* and, at the same time, an *accelerated decline* of indigenous production, bringing total import needs way above 400 bcm/a.

- The assertion of NS2 opponents that NS2 would increase gas supply dependency on Russia and thus create exposure to political blackmail is ignoring the massive change of market circumstances since 2009 (Ukrainian gas crisis):
 - The European gas market can meanwhile be called an (almost complete) 'European Henry Hub', where price formation occurs by supply and demand with no remaining price-setting power of importers including Russia. The – leading - TTF features as European and increasingly also as global price benchmark. The European markets are thus capable of sending out price signals to attract alternative supplies should there be any (accidental or intentional) supply shortage.
 - Europe avails, besides vast storage capacity, of significant redundant import capacities. The LNG import capacity alone caters for volumes larger than the entire Russian supplies to Europe. Europe is thus capable of *receiving* alternative supplies should the need arise.
 - The so-called 'LNG revolution' has fostered a global gas market. It has spawned ever more destination-flexible LNG supplies (> 400 bcm/a) which would readily respond to European price signals. The availability of and access to global LNG constitutes the 'policeman' watching over the maximum achievable price for pipeline suppliers in Europe.
 - In consequence, the water-borne LNG trade has turned gas into a fungible commodity comparable to crude oil. European security of supply has transformed from 'bilateral physical dependency' (prevailing in 2009) towards a '*functionality of price signals*' (today), rendering assertions of dependency on Russia yesterday's news.
- With its high degree of diversified supplies and its significant redundant import capacities, Europe is the 'perfect storm' for supplier competition. In consequence, prices are low and thus hugely beneficial for European consumers.
 - Until 3Q'18 Asian prices were significantly higher (~3.3 \$/MMBtu) than the European prices. Had there been a shut-out of Russian pipeline supplies by Europe, European consumers, competing with Asia for LNG supplies, would have had to pay an extra ~50 billion Euros per annum.
 - After the Asian price premium collapsed as of 4Q'18, Europe saw a surge of LNG imports as a market of last resort. The ensuing LNG/pipeline supplier competition caused a massive price drop (from 27 to <10 €/MWh) benefiting European consumers.

- Gazprom retained its year-on-year total sales to Europe in 2019 by selling significant volumes via its exchange-like ESP platform, with a variety of traded products at TTF price levels, i.e. acting as 'price-taker'.
- It is a reasonable certainty that Asian demand will pick up again and, subsequently, an Asian price premium will arise. With sufficient pipeline supplies, having to submit to the powerful European traded markets as price taker, European consumers will continue to enjoy competitive prices. But the need to compete for LNG with Asia at elevated prices on a permanent basis would not arise.
- Conclusions:
 - While European politicians have thus far reacted to the sanctions through 'outrage by lip-service only', the insight that also European climate goals are obstructed and security of supply might be at risk, should hopefully trigger second thoughts and result in decisive action against the sanctions.
 - The amendment of the Third Gas Directive is misusing regulation as a political weapon. Since hampering the EC's own aspirations to battle climate change and unnecessarily putting security of supply at risk, its potential negative consequences for the operability of NS2 should be alleviated.

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1. Introduction

It may strike the reader as odd that the author, with a track record of two multibillion USD arbitrations *against* Gazprom in his former capacity as responsible board member of RWE Transgaz a.s., steps to the fore to speak out in support of the so controversially debated Russian import pipeline Nord Stream 2 ('NS2').

My motivation is gas advocacy: The future survival of the gas industry hinges on its ability to credibly convey that its contribution to battle climate change does not stop at replacing coal, lignite and oil products, thereby achieving significant reductions in CO₂ emissions and substantially improving air quality. Beyond that, it must demonstrate that it is seriously reducing CO₂ and CO₂ equivalent ('CO₂eq') emissions (i.e. methane) along the entire gas value chain *already before* it, eventually, converges from – ever more 'greening'¹ - fossil gas towards carbon-free gaseous molecules.

One important aspect in substantially reducing CO₂eq emissions along the value chain is state-of-the-art modern infrastructure, i.e. new or upgraded pipelines and state-of-the-art energy-efficient compressor stations. NS2 delivers exactly that.

Already a 'minor' delay would be an opportunity lost for the climate and even more so if there were a protracted delay in completing NS2 and/or becoming operational.

Moreover, all arrangements pertaining to the future supply of Russian gas to Europe, be it Ukrainian transit, the Yamal transit extension or the re-instituted restriction of Opal capacity use, appear to ride on the tacit 'optimism' that NS2 will be completed, albeit with 'some delay'. If, however, the delay would be much longer than assumed, a serious security of supply issue² could arise: Spare import pipeline capacity capable of providing flexibility for the seasonal heat pattern and rising volatility in power generation, previously to a large extent provided by the Groningen field, has diminished to critical levels.

As the title suggests, we shall first look at the most striking aspects of politicization, hypocrisy and ignorance by revealing a few inconvenient truths.

Thereafter, we shall demonstrate that NS2 would significantly contribute to the reduction of CO₂eq emissions. We shall then address the potential risk for security of supply if NS2 were delayed perhaps longer than the 'optimists' assume. Thereafter, we shall discuss the prevailing market realities which underpin that NS2 is not a threat but useful.

2. Politicization, hypocrisy and ignorance – a few inconvenient truths

While U.S. government representatives assert 'malign' Russian influence, European NS2 opponents regard the pipeline as the Trojan horse by which the Russian president could use gas as a political weapon. Both assertions are characterized by a high degree of politicization, hypocrisy and ignorance. The U.S. are clearly pushing (perceived) American business interests: the sale of LNG. European opponents are caught in a claustrophobia hinging on more than 10

¹ 'Greening' is meant as a metaphor for all manner of decarbonized gaseous molecules.

² As shall be explained later, a security of supply disruption does, in the prevailing market environment, not mean physical shortfall but rather rising traded prices.

year old circumstances prevailing during the Ukrainian gas crisis of 2009, which - today - are yesterday's news.

2.1 Amendment of the Gas Directive: the use of regulation as a political weapon

Even the OIES - usually restrained by academic etiquette - qualifies the 2019 amendment of the Third Gas Directive an “*example of politicization*”³. Kim Talus is more outspoken: He qualifies the amendment a “*discrimination in violation of World Trade Organization rules*” and, moreover, a “*violation of the general EU principle of non-discrimination*”⁴. I couldn't agree more: the amendment is clearly a ‘Lex NS2’. While the NS2 opponents assert that Russia might use gas as a political weapon, it is the European Commission which uses *regulation* as a political weapon.

The author personally finds that particularly annoying since it appears to have been completely forgotten that Europe's insistence on extending European market rules beyond European borders (namely some 1,600 km through Turkey) in lecturous arrogance, was one of the major reasons for the failure of the Nabucco pipeline, thereby destroying the chance to create a Southern Corridor to speak of⁵.

Where is the improvement in competitiveness of the European gas market⁶, if European rules suddenly (and retroactively) apply to an offshore import pipeline 12 miles off the coast of the receiving country (instead at landfall)?

What relevance for European consumers do regulated tariffs, for a miniscule fraction of the pipeline, have when the achievable price is in any event the traded market price and the cost to get it there are only relevant for the well head netback of the producer?

And what sense does it make to have third-party access to a subsea pipeline 12 miles off the coast, and for which gas?

At a conference last year in Berlin I could not help but become sarcastic. I called the amendment an employment program for deep-sea divers by ‘accessing’ the pipeline under water with a blow-torch to inject gas carried in back-pack canisters.

³ Pirani et alia, OIES Energy Insight 65, page 9, footnote 43.

⁴ Talus, Problems remain, p. 8/9.

⁵ The author was chief negotiator for RWE to fill RWE's share of the pipeline capacity with supplies – in Azerbaijan, Iraq and Turkmenistan – and experienced the failure of the project hands-on.

⁶ See e.g. Anton Anton, Minister of Energy of Romania: “...we now have a good solution which will guarantee that we have a fair and competitive European gas market.”,
https://www.eumonitor.eu/9353000/1/j9vvik7m1c3gyxp/vkxodn10ypv9?ctx=vg9pi5ooqcz3&start_tab0=20

Figure 1: The amendment – employment for deep-sea divers ?



Source: Gas Value Chain presentation at 'Expert Talks on Oil & Gas Market Developments and Geopolitics, Stiftung Wissenschaft und Politik, Berlin, 20 August 2019

The German regulator Bundesnetz-Agentur (BNetzA) is supposed to shortly decide about NS2's derogation application with a variety of issues on the table⁷. E.g. any major constraint in utilizing the full capacity of NS2 would directly conflict with the lawfully completed exhaustive bookings of the onshore extension of NS2, the EUGAL pipeline⁸. Moreover, in the event of inhomogeneous regulatory regimes along the pipeline, particularly tariffs, the project structure may have to be adapted. It would go too far for the purposes of this paper to discuss the entire raft of potential ramifications⁹. It is clear though that overcoming the regulatory challenges to achieve operability is complex and far from being a 'walk in the park'.

2.2 The U.S. sanctions: unacceptable interference in European energy policy

The U.S. sanctions are clearly an entirely unacceptable extra-territorial interference in European energy policy. This alone should have sufficed to mobilize strong counter-reactions from Europe with a view to have the sanctions removed.

Initially, the imposition of U.S. sanctions on NS2 indeed triggered strong reactions from European politicians across the board¹⁰, including many who had previously been opposed to

⁷ <https://www.bloomberg.com/news/articles/2020-01-21/nord-stream-2-pins-hope-on-germany-to-clear-eu-gas-rule-hurdle>

⁸ Pirani et alia, OIES Energy Insight 65, page 6.

⁹ For a more detailed analysis see Pirani et alia, OIES Energy Insight 65, pages 4 to 6.

¹⁰ See e.g. Josep Borrell (EU High Representative and Commission Vice President): "The EU does not recognise the extraterritorial application of US sanctions, which it considers to be contrary to international law. Furthermore, EU policies and practices should not be determined by the threat or imposition of third country sanctions. As a principle, the EU opposes the imposition of sanctions against EU companies conducting legitimate business in

the pipeline. The unacceptability of extra-territorial interference in European energy policy fostered a – temporary - solidarity of sorts. But while U.S. Energy Secretary Dan Brouillette was beating his chest at the Munich Security Conference in February 2020 that the U.S. had “*thwarted*” the NS2 pipeline¹¹, the European reactions soon proved to be ‘outrage by lip-service only’ with no subsequent action¹². When the Russian president proclaimed that Russia would finish the pipeline on its own, some may have thought that the U.S sanctions would be no more than a fruitless episode.

The U.S. administration’s efforts to support American LNG suppliers are misplaced and, in the face of a global gas market, also entirely unnecessary. I have encountered strong discomfort of U.S. LNG exporting companies with the U.S. government’s campaign. While the U.S. government has no powers to instruct U.S. companies to where they should send their LNG exports, they fear some kind of moral obligation might arise in the context of ‘fighting malign influence’. Their preference is to decide on their own where they can achieve the highest netback and they would surely prefer to supply Asia if demand and prices pick up. In the meanwhile, large quantities of U.S. LNG are arriving in Europe as market of last resort, i.e. Europe is ‘open for business quite without the ‘help’ of American politicians.

2.3 Hypocrisy: Russian gas through Ukraine & Russian LNG not ‘malign’?

The assertion that ‘malign’ Russian molecules create exposure to political blackmail reveals hypocrisy and ignorance, in that it is only directed at Russian gas carried by NS2.

In contrast, continued Ukrainian transit of molecules of the very same Russian origin saw strong political support.

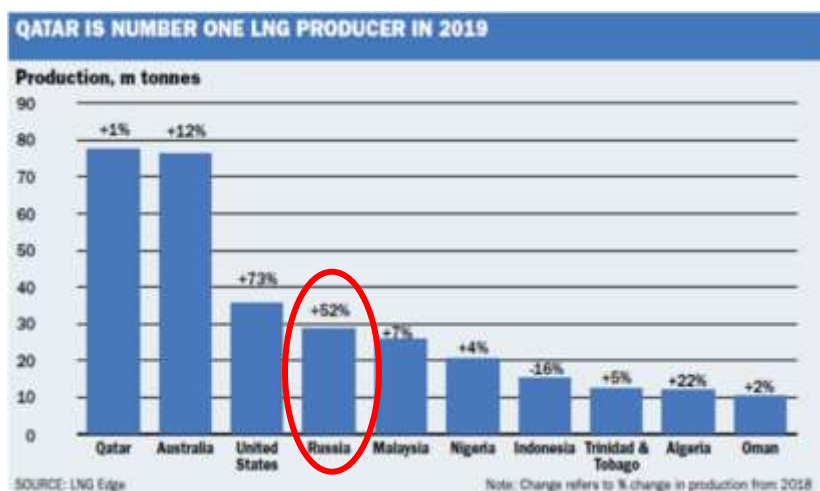
A further inconvenient truth is the fact that Russia has also evolved as a significant global LNG player. In 2019, Russian LNG exports rose by 52%, thereby making Russia the no. 4 global LNG supplier.

accordance with EU law.” (04.02.2020, answer on behalf of the European Commission to question by Sven Schulze, PPE: https://www.europarl.europa.eu/doceo/document/E-9-2019-002880-ASW_EN.pdf); Manfred Weber (EPP leader in the European Parliament): “The USA’s approach to Nord Stream 2 is not correct,” Weber said. “You can’t sanction a friend and partner and take the economy hostage.” (19.12.2019, Funke group newspapers, picked up by <https://presse-augsburg.de/weber-us-sanktionen-gegen-nord-stream-2-nicht-korrekt/513799/>); Jürgen Trittin (Green Party, Bundestag MP): “What are the German government and the EU Commission doing to protect European companies from blackmail like Ted #Cruz and Ron #Johnson? Or should the sales of US #Fracking Gas be rewarded with further subsidies for terminals? #NorthStream2” (19.12.2019, Twitter, <https://twitter.com/JTrittin/status/1207614493230010369>)

¹¹ <https://www.bloomberg.com/news/articles/2020-02-15/u-s-says-it-has-thwarted-6-billion-russia-germany-gas-pipeline>

¹² Given the blatantly obvious ‘U.S. LNG agenda’ an appropriate (and effective) reaction could have been to slap tariffs on U.S. LNG, which presently arrives in large quantities in Europe as a market of last resort, see e.g. MdB Klaus Ernst: “Dabei muss sie auch Strafzölle der Europäischen Union gegen LNG-Gas aus den USA einfordern“ (<https://www.linksfraktion.de/presse/pressemitteilungen/detail/nord-stream-2-klare-kante-gegen-us-sanktionen/>)

Figure 2: Russian LNG exports



Source: ICIS Heren, GIF 27.01 of 15 January 2020

Except for a brief outrage in the U.S. in May 2018, when two re-loaded cargos of the Novatek/Total Yamal LNG terminal found their way to Engie's Everett terminal near Boston¹³, nobody appears to take issue with the rising quantity of Russian LNG. The U.S. government does apparently not include Russian LNG in its campaign against 'malign Russian influence'.

European NS2 opponents have also not raised concerns, although, during winter, when the Northeast passage to Asia is blocked by ice, the influx of Russian LNG into Europe is substantial.

2.4 More hypocrisy: Russian crude oil - not sanctioned but imported

While the U.S. assert that Russian gas is of 'malign influence' and thus justifies sanctions, their stance on Russian crude oil has been different and reveals further hypocrisy.

At the 'Expert Talks' in Berlin on 13 September 2018, organized by Stiftung Wissenschaft und Politik (SWP), the then deputy secretary of the U.S. Department of Energy ('DoE'), Dan Brouillette, was strongly 'advising' Europe to shun Russian gas and buy 'freedom molecules' instead. On the very same day, his boss Mr. Rick Perry, at the time Secretary of the DoE, was meeting in Moscow with the Russian Minister of Energy, Mr. Alexander Novak, encouraging Russia to keep up the Russian crude oil production levels to avoid price spikes¹⁴.

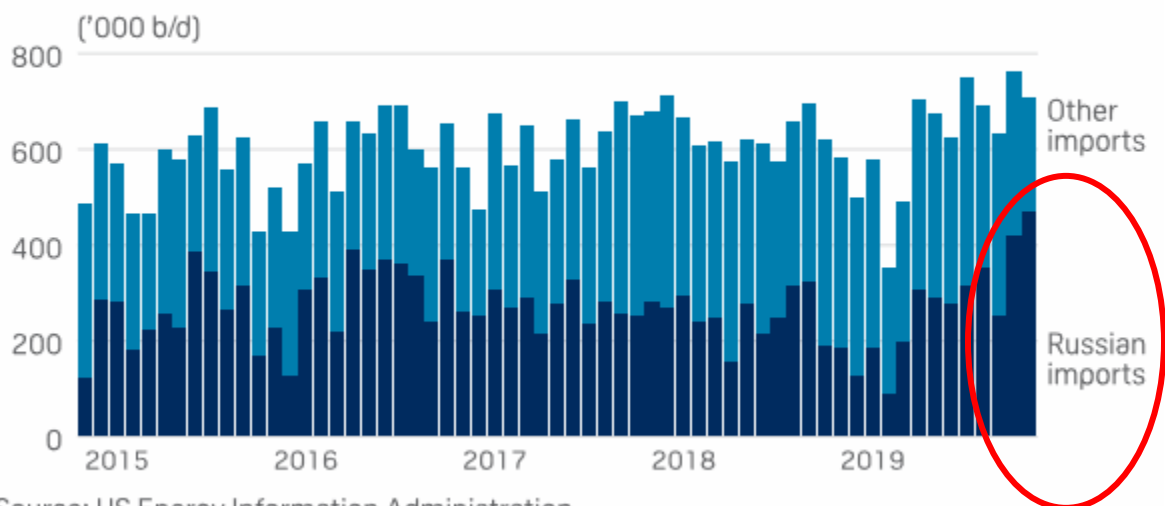
And the biased U.S. attitude does not stop at 'discussing' Russian crude oil production levels: Russia is one of the largest *importers* of crude oil into the U.S.

¹³ LNG World News 2/5/2018 (www.lngworldnews.com)

¹⁴ <https://www.reuters.com/article/russia-usa-novak-perry-meeting/update-1-perry-encourages-saudi-opec-russia-to-work-against-oil-price-spike-idUSL5N1VZ64H>

Figure 3: Russian Crude imports into the U.S.

US IMPORTS OF RUSSIAN UNFINISHED OILS ON RISE WITH VENEZUELA OIL EMBARGO IN PLACE



Source: US Energy Information Administration

Source: <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/021020-climbing-us-imports-of-russian-crude-residue-could-complicate-venezuela-sanctions>

While the U.S. has meanwhile turned a net-exporter of crude, large quantities of crude of the heavier grade are imported. Namely refineries along the Gulf of Mexico coast, previously using heavy crude imported from Venezuela, have turned to Russian supplies.

If the U.S. were sincerely intent on 'punishing' Russia with a view to 'protect' their allies (as opposed to running an LNG sales campaign), they would sanction Russian oil and not gas. The following numbers are rough approximations to make the point:

- The boycott of all Russian gas to Europe (~200 bcm in 2019) would, at a price of ~18 €/MWh, reduce Russian income by ~36 billion USD per annum.
- As to crude oil, Russia produces roughly 10 mmbbl/d, of which some 5 mmbbl/d are exported. The boycott of Russian crude oil exports would, at a price of ~60 \$/bbl, deprive Russia of ~108 billion USD¹⁵ per annum, i.e. more than three times as much as for gas.

It becomes blatantly obvious that the U.S. government is pursuing an LNG sales campaign camouflaged as 'protection of their allies'.

At the same time, also European NS2 opponents must be accused of biased ignorance: more than 30% of European crude oil imports come from Russia¹⁶.

¹⁵ The ratio remains the same at prices of ~9 €/MWh for gas and ~30 \$/bbl for crude oil.

¹⁶ <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html>

2.5 Both 'Lex NS2' and the U.S. sanctions obstruct climate efforts

Increasing scrutiny of full value chain emissions

The CO₂ and methane emissions (CO₂eq) along the full gas value chain are undergoing increasing scrutiny. There are multiple well-to-grid, well-to-wheel, well-to-tank and full-life-cycle GHG¹⁷ assessment studies. While some may appear 'self-serving'¹⁸, others appear credible, with all of them wrestling with insufficient and inconsistent data.

The European Commission is working, as a first step, on a method to reliably and uniformly measure all gas value chain emissions of gas imported into the European Union. Kadri Simson, the new EU's energy Commissioner, announced "a strategy to curb methane emissions" as part of policy priorities¹⁹.

Respective regulation, perhaps accelerated and augmented by the new 'Green Deal', can be expected rather sooner than later: the new 'gas package' is envisioned to be completed in 2020. It can be expected that such new regulation would e.g. require for all gas imported into the European Union 'certificates of origin' documenting the respective carbon footprint, thereby creating a carbon footprint merit order. It would come as no surprise if, in a next step, a levy correlated to the size of the carbon footprint would be imposed. It appears, therefore, advisable to take a sober look at the carbon footprint of NS2 in comparison with other import sources.

Current assessments of full value chain emissions: NS2 comes out 'best in class'

The thinkstep GHG study 2017, as shown on the graph below, demonstrates that imports via NS2 feature, with 6.3 g CO₂eq/MJ, a very low GHG profile. In contrast, imports via the various LNG supply chains assessed, feature a carbon footprint 2.4 (Qatar) to 4.6 (Australia) times higher than supplies via NS2²⁰.

¹⁷ Greenhouse Gas.

¹⁸ See e.g. the ICCT study 'The climate implications of using LNG as a marine fuel', attempting to prove that marine bunker fuel is superior to LNG (<https://theicct.org/publications/climate-impacts-LNG-marine-fuel-2020>).

¹⁹ 'The European Commission is preparing a strategy to curb methane emissions from the oil and gas industry, including fracked LNG imported from the US., ... officials are still busy collecting data on which to base a credible policy.', (<https://www.euractiv.com/section/energy-environment/news/eu-working-on-plans-to-expose-climate-impact-of-natural-gas/>).

²⁰ It should be emphasized that LNG imports with, relative to NS2, higher carbon footprint still outperform coal, lignite and heavy fuel oil by far, by CO₂eq emissions and also air pollution.

Figure 4: NS2 ‘best in class’ on GHG emissions

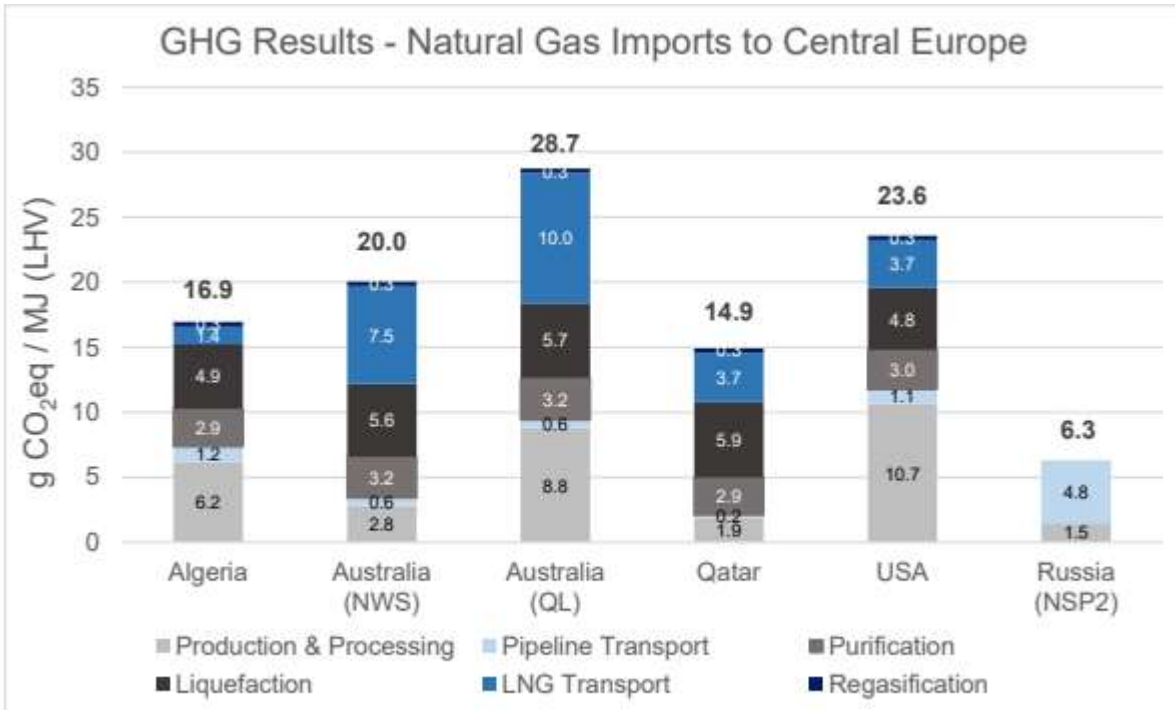


Figure 6-1: Overall GWP result for the base case

Source: thinkstep GHG study 2017

Thinkstep explains that the relatively new gas field feeding NS2, Bovanenko, is characterized by conventional extraction with very low fugitive methane emissions. The pipelines, both onshore and offshore, and the respective compressors, are new and highly energy efficient. The route to market is shorter than transit e.g. through the Ukraine.

Thinkstep has i.a. compared its results with the findings of the DBI 2016 study²¹. The DBI study hinges on the earlier EXERGIA study on behalf of the European Commission, ensuring comparability by use of the same model as Exergias²². Thinkstep’s findings are in line with the findings of the DBI study.

Thinkstep had its approach and results audited and vetted conform ISO 14010/14044 by three renowned independent institutes²³. Moreover, the findings of thinkstep are confirmed by a report of the ‘Scientific Service of the German Parliament’ on CO₂equ emissions of various energy

²¹ Critical Evaluation of Default Values for the GHG Emissions of the Natural Gas Supply Chain" (<https://www.dbi-gut.de/emissions.html>).

²² DBI used the model GHGenius (version 4.03) for determining the carbon footprint - the same version of the model as was used by the EXERGIA study.

²³ DEKRA Assurance Services GmbH, Fraunhofer Institut für Bauphysik and the Wuppertal Institut für Klima, Umwelt, Energie gGmbH.

carriers, with emphasis on LNG²⁴. It was commissioned by the 'Umweltbundesamt' ('UBA'), an agency of the German Ministry for the Environment, which does not exactly have a reputation of favoring fossil fuels.

The report of the Scientific Service of the German Parliament concludes that natural gas imports via NS2 show, with regard to its contribution to curb climate change, a favorable GHG profile compared to LNG imports. Even vs. the best LNG alternative, namely LNG imports from Qatar, a 55 bcm/a volume carried by NS2 renders a saving of 17.1 million tons of CO₂eq.

The Ukrainian transit accord: happy politicians but a draw-back for the climate

Despite the fact that both NS2 and the Ukrainian transit pipelines carry 'malign Russian molecules' of the very same Russian origin, European politicians and officers of the EC were strongly supporting continued Ukrainian transit while opposing, with a few exceptions, NS2 at the same time. The last minute compromise was mostly found on political level²⁵. I am tempted to say that the Ukrainian accord came about *despite* U.S. sanctions imposed, since apparently 'optimism' reigned assuming that the completion of NS2 would be delayed but only slightly.

The fact that it had been the Ukraine lobbying hardest in Washington to impose extra-territorial sanctions interfering in the energy policy of its European partners did apparently not diminish the friendship: politicians and officers of the EC involved were 'happy'²⁶. That the delay of NS2 – and in consequence a greater Russian need for continued use of Ukrainian transit – was at the same time a draw back for the climate, went unnoticed.

Besides a longer route to market, the carbon footprint of Ukrainian transit is also tarnished by decades of neglect (e.g. maintenance, upgrades), i.a. resulting in questionable pipeline integrity and highly inefficient compressors, the latter using up to 4 times the amount of fuel gas a modern compressor conforming to Western standards would²⁷.

The graph below of the Incentive NS2 delay study²⁸ picks up the findings of the DBI 2016 study: A one year delay of transporting 55 bcm through Ukrainian pipes instead of via NS2 causes ~11 million tons of entirely unnecessary CO₂eq emissions per year.

²⁴ Wissenschaftliche Dienste, Deutscher Bundestag, 'CO₂ Bilanzen, Einzelfragen zu Energieträgern, insbesondere Flüssiggas (<https://www.bundestag.de/resource/blob/550728/61522d07688eb301e4edf6b8d2e68f41/wd-8-003-18-pdf-data.pdf>)

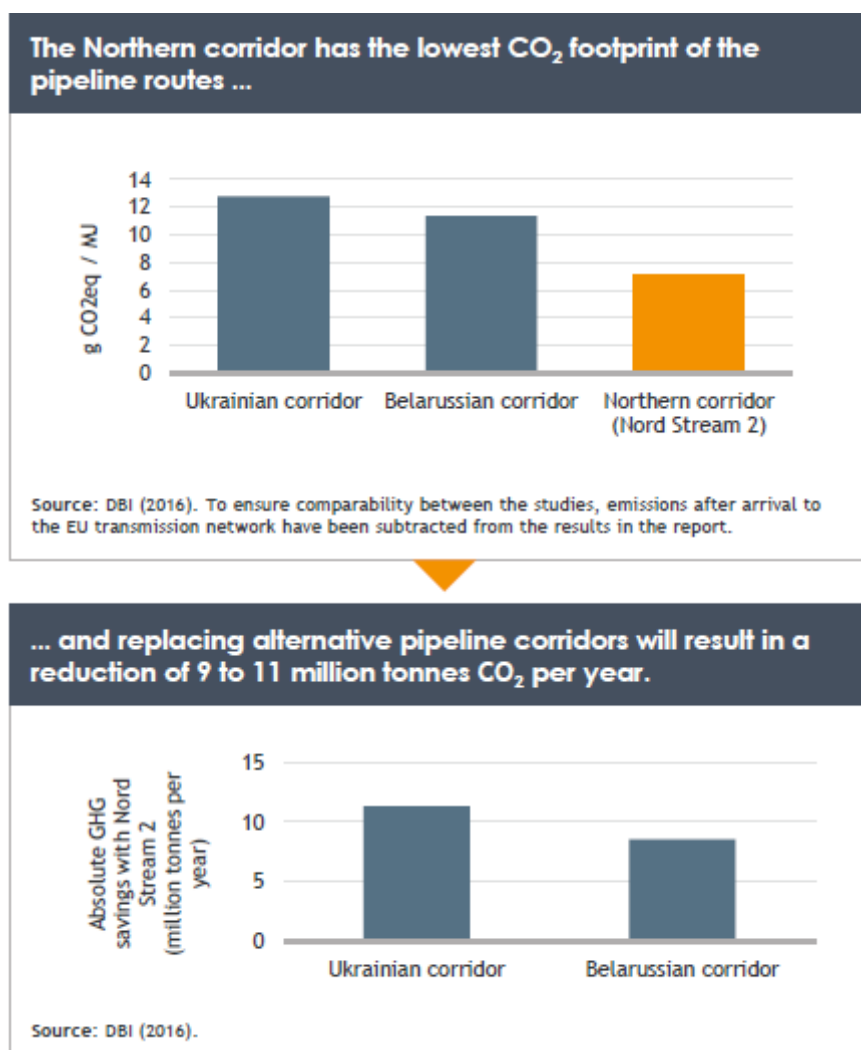
²⁵ For details see Pirani/Sharples, OIES Energy Insight 64, page 2.

²⁶ European Commission Vice President Maros Sefcovic: "...is very positive news for Europe, for Russia and Ukraine," (<https://www.reuters.com/article/us-ukraine-russia-gas-deal/russia-ukraine-europe-agree-in-principle-on-new-gas-deal-eus-sefcovic-idUSKBN1YN2MK>).

²⁷ See e.g. Danila Bochkarev: "...more than 60% of pipelines are more than 33 years old, and only three out of the countries 542 pumping units (compressor stations) are less than 10 years old." (<https://www.euractiv.com/section/energy-environment/opinion/derailing-russia-ukraine-gas-transit-talks-would-harm-the-eu-consumer/>)

²⁸ Incentive NS2 delay study, p. 35.

Figure 5: NS2 vs. Ukrainian transit GHG emissions



Source: Incentive NS2 delay study²⁹

What a more climate-friendly Ukrainian accord could have looked like

While there was never doubt amongst experts that there was a business case for Ukrainian transit despite NS2, the ‘climate-friendly’ train of thought had been for Ukraine to predominantly serve as ‘peak shaver’ for seasonal swing requirements on a *long-term basis*. If respective bookings would have been done on a capacity basis in accordance with European standards (instead of the frequently hailed volume flows), the income would have been sizeable and also independent of whether used or not (‘ship-or-pay’). Moreover, the portion of the Ukrainian system thus booked could have been revamped and upgraded to Western standards, such investment reducing the carbon footprint of Ukrainian transit as well.

²⁹ ‘Consequences of a delay of Nord Stream 2’, by Incentive in June 2019 (<https://wintershalldea.com/sites/default/files/media/files/Incentive%20Consequences%20of%20a%20delay%20of%20Nord%20Stream%202.pdf>)

The only 5 year, volumetric ‘sliding scale’ structure of the transit accord (from 65 bcm in 2020 towards 40 bcm/a in 2021 through 2024³⁰), albeit booked on a ship-or-pay basis³¹, is, for such investment, a more than sub-optimal structure. Unsurprisingly, the plans of Ukrainian TSO GTSOU, as corroborated by Pirani et alia³² do not bode well for the climate: i.a. the Ukrainian system shall be ‘reconfigured’ on the assumption that 40 bcm/a will be needed up to (and beyond?) 2024, by scaling back maintenance and reduce fuel gas consumption. Redundant entry points at the Russian/Ukrainian border will be mothballed. For this and more, an investment program 2020-24 of USD 750 million is foreseen³³ – clearly a drop in the ocean and not very promising for the reduction of the carbon footprint of the remaining Ukrainian facilities used.

2.6 Tacit ‘optimism’ that NS2 will be completed shortly poses security of supply risk

The author finds it troubling that apparently all relevant players tacitly assume that NS2 will be completed and the delay will be small. Based on this ‘optimism’, arrangements such as e.g. the Ukrainian transit accord are ‘stitched tightly on edge’³⁴, i.e. do not cater for alternative capacity to speak of in the event of a more protracted delay.

Also reputable analysts appear to share this optimism. E.g. Pirani et alia assume that NS2 will be completed and operational end 2020 or in 2021 the latest³⁵. I have the highest respect for my friends at the OIES and sympathize with their optimism. I would, however, prefer *certainty over optimism*, achieved by removing the sanctions and alleviating the regulatory ramifications. What if completion of NS2 is delayed much longer, or overcoming regulatory ramifications to achieve operability takes more time, and, at the same time, we get an unusually cold winter (e.g. another ‘beast from the East’) in 2020/21 or 2021/22, while Asian demand for LNG has picked up again? Such combination of circumstances could quickly lead to a security of supply issue, costing European consumers dearly³⁶ and – hurting the reputation of natural gas once more.

Spare pipeline capacity is needed to substitute Groningen flexibility managing seasonality and volatility

In its Global Gas Security Review 2019³⁷, the IEA dedicates a special chapter to the flexibility needs in the Northwest-European market, both to meet the seasonal heat pattern and the growing volatility arising from renewable power generation, i.e. when the wind does not blow and the sun does not shine. Much of this flexibility has previously been provided by the swing capabilities of the Groningen field. The IEA explains that, to substitute for the arising flexibility gap, a combination of ‘tools’, upstream production flexibility, storages, LNG terminals but, importantly, also *spare import pipeline capacity* are necessary.

³⁰ Pirani/Sharples, OIES Energy Insight 64, page 1.

³¹ Pirani/Sharples, OIES Energy Insight 64, page 5.

³² Pirani et alia, OIES Energy Insight 65, page 15 and footnote 66.

³³ Pirani et alia, OIES Energy Insight 65, page 15.

³⁴ The German expression for this would be ‘auf Kante genäht’, not an approach advisable for security of gas supply.

³⁵ Pirani et alia, OIES Energy Insight 65, pages 3-4.

³⁶ As already explained earlier, a security of supply issue in the current market will not lead to curtailments, but rather result in higher traded prices.

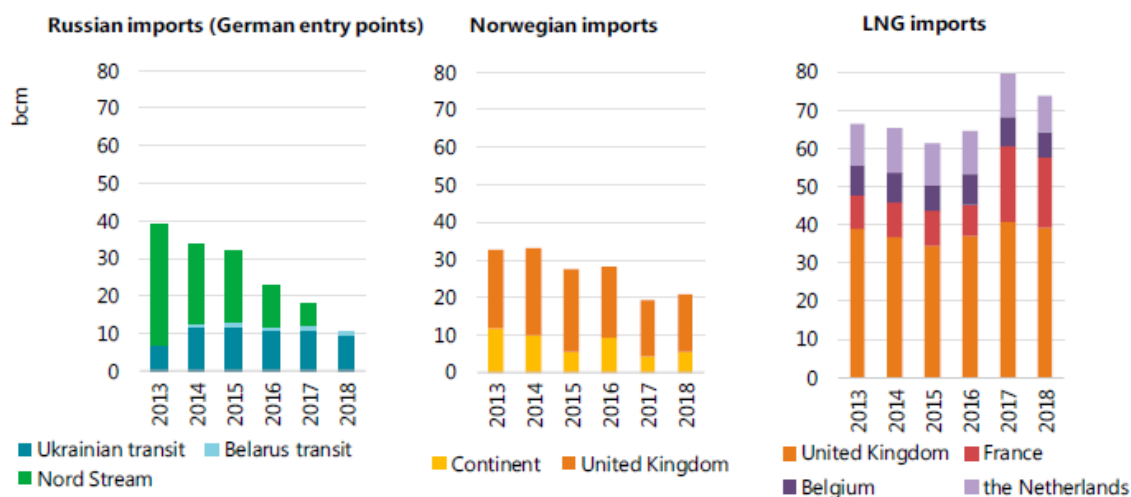
³⁷ IEA GGSR 2019.

According to the IEA, annual spare import capacity has more than halved, decreasing from 70 bcm/a in 2013 to just above 30 bcm/a in 2018, as both Russian and Norwegian pipeline deliveries increased considerably during this period to compensate for the decline of domestic production³⁸.

While, despite higher utilization in 2019, there is still ample spare capacity provided by the LNG terminals, Norwegian spare import capacity to the Continent has shrunk to 5 bcm/a, a critically low level. Russian spare pipeline capacity, with full utilization of Nord Stream 1 and Yamal, has shrunk to 10 bcm/a via the Ukrainian transit route.

Figure 6: Annual spare import pipeline capacities

Figure 39. Annual spare import capacity to north-western Europe by origin of imports (2013–18)



Source: IEA (2019b), *Gas Trade Flows*, www.iea.org/gtfl.

Spare import pipeline capacity to north-western Europe has more than halved since 2013, falling from 70 bcm/y to just above 30 bcm/y, whilst spare regasification capacity rose by 10% to above 70 bcm/y.

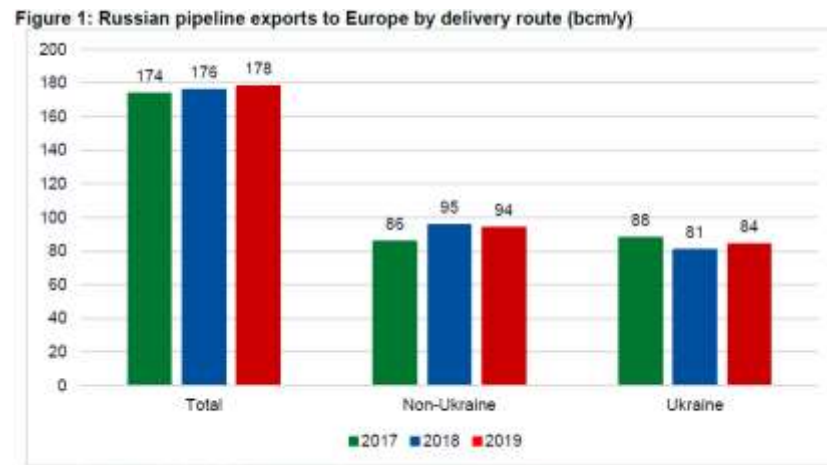
Source: IEA GGSR 2019

The IEA graph was done before the Ukrainian transit accord, i.e. it assessed spare Russian import capacity based on the utilization of the Ukrainian transit system in 2018. As the OIES graph below demonstrates, Russian volumes flowing through the Ukraine in 2018 amounted to 81 bcm and 84 bcm in 2019³⁹.

³⁸ IEA GGSR 2019, p. 54.

³⁹ Pirani/Sharples, OIES Insight 64, page 5.

Figure 7: Russian use of Ukrainian transit 2018/19



Source: Data from ENTSOG Transparency Platform, graph by the author

Source: Pirani/Sharples, OIES Energy Insight 64

Thus, if subsequent the Ukrainian transit accord the availability of Ukrainian transit capacity would, as is the plan, be reduced to ~40 bcm/a, Russian spare import capacity needed to manage seasonal swing absent NS2 being operational would essentially vanish. As Pirani/Sharples indicate, the Ukrainian accord caters for short-term additional capacity bookings beyond the agreed ship-or-pay capacities⁴⁰, but surely not in quantities carried by NS2. In other words, ascertained security of gas supply is riding on optimism. However, the yardstick for a matter so serious as security of supply should not be 'optimism' but rather certainty, achievable by removing the sanctions and alleviating the amendment ramifications.

The Yamal transit agreement expires in May 2020 – and nobody moves

Barely noticed, a further potential transit capacity shortfall will arise shortly: The transit agreement for the Belarus/Poland Yamal pipeline elapses in May 2020. Pirani et alia, based on their (laudable) optimism that NS2 would be completed in late 2020 or early 2021, sensibly anticipate that Gazprom would increase utilization of its Ukrainian ship-or-pay bookings and Yamal could be the 'collateral damage'. They expect that there would be no long-term bookings of Yamal capacities, but rather short-term bookings should the need arise⁴¹.

While the possibility of short-term bookings creates the impression that Yamal serves as 'spare import capacity' and security of supply could be covered in case of need, significant uncertainty remains: The absence of long-term bookings poses the question how long a pipeline system not booked and only used as a 'stand-by facility' can be maintained and kept available for use. It stands to reason that Poland, perhaps the most ardent opponent of Russian gas supplies at large, would not go out of its way to retain the pipeline for long if it earns no commensurate revenues.

⁴⁰ Pirani/Sharples, OIES Energy Insight 64, page 4.

⁴¹ Pirani et alia, OIES Energy Insight 65, page 10/11.

Opal utilization restriction re-instituted by the ECJ – Poland rejoices and the EC doesn't act

The EC-imposed utilization restriction of the Opal pipeline caused a scandalous underutilization of Opal and hence Nord Stream 1 for many years. This was eventually alleviated by an accord between the EC and Gazprom. The ECJ⁴², in a surprise ruling, re-imposed the utilization restriction for the Opal pipeline on the grounds that the EC had violated European energy solidarity by not considering, in its decision-making process, potential negative effects for the security of supply of Poland⁴³.

At present, the newly arisen shortfall in onshore onwards transport capacity for Nord Stream 1 volumes is compensated by using the first string of EUGAL, completed and operational since the end of 2019⁴⁴.

If, for argument's sake, NS2 were completed and operational shortly as the optimists assume, we would still be stuck with a diminished import capacity on significant portions of Nord Stream 1 supplies and thus again with a diminished spare import capacity. In the event of similar circumstances as described above (another 'beast from the East', while Asian demand has picked up), security of supply tightness could also arise if a significant portion of Nord Stream 1 onshore onwards transport capacity were blocked.

The question therefore is, why the European Commission, the safe-keeper of European security of supply, is not acting to alleviate the situation.

The 'finding' of the ECJ was that, in alleged violation of energy solidarity, Polish security of supply concerns had not been considered. Healing this 'procedural flaw' would be easy: As The Gas Value Chain has analyzed and explained at great length in its Polish market study, the Polish RSI (residual supply index), i.e. the available sum of supplies after subtracting the largest single source of supply (Russia) features, properly computed, 117%⁴⁵. In other words, Poland may have impressed the ECJ with its emotional arguments of not having been included in the considerations of the EC. But if it had been included in the considerations (or would be in a 5 minute repeat procedure), the result would have been the same: Absent Russian supplies Poland avails of four other sources of supply collectively constituting more than 117% of its domestic demand. It is hence neither negatively affected by Nord Stream 1 (and Opal) nor by NS2 (and EUGAL). Quite the contrary, Poland would even benefit from increased liquidity in the adjacent German traded market Gaspool if only it would finally remove its existing cross-border trade barriers.

3. Rising demand, widening import demand and need for further import capacity

The role of gas is growing i.a. due to the envisaged phase out of coal-fired and nuclear power plants and the switch from oil to gas in the heat sector in pursuit of the energy transition. This substitution will significantly reduce CO₂equ emissions and improve air quality. In consequence, demand has, against previous predictions, risen substantially. Moreover, in the face of an accelerated decline of indigenous production, also import demand is rising further.

⁴² European Court of Justice

⁴³ <https://www.reuters.com/article/us-pgnig-gazprom-opal/eus-top-court-curtails-gazprom-access-to-nord-stream-pipeline-link-idUSKCN1VV0TH>

⁴⁴ Pirani et alia, OIES Energy Insight 65, page 6.

⁴⁵ Peters, Poland, a 'failed state' in gas trading, page 24. Note the author took liberty in deviating from the 'overly careful' approach of ACER in computing the RSI.

Notwithstanding the foregoing, there are postulates that no further fossil gas – and thus NS2 – should be allowed.

3.1 The need for gaseous molecules: first fossil, later ‘green’

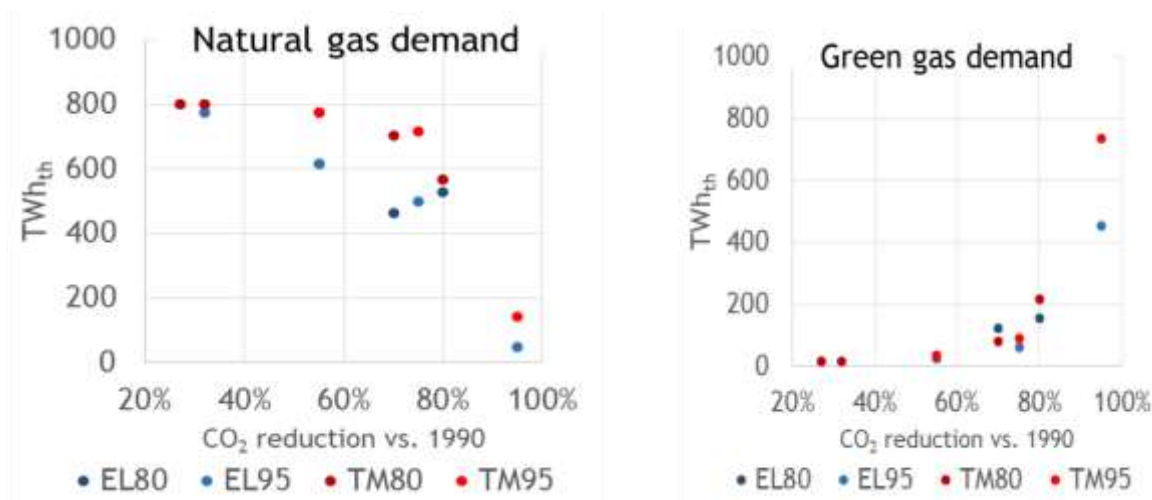
A frequently used additional argument by NS2 opponents is that ‘further fossil gas’ is neither needed nor welcome. This argument is partly hinging on the – unrealistic – ‘all-out’ electrification ideology, and partly simply revealing ignorance as to the requirements of an effective and cost-efficient energy transition.

Multiple studies, not least the comprehensive German ‘dena Leitstudie 2018’⁴⁶, have demonstrated that gaseous molecules are superior to electrons due to their higher energy density and thus pivotal for the energy transition.

It has also been demonstrated in a multitude of studies that there is a clear correlation between the degree of decarbonization and the type of gaseous molecules deployed. Fossil gas supports the energy transition significantly (by replacing coal, lignite and oil products). Already *during* this substitution process, gas itself must turn ever ‘greener’⁴⁷, i.e. perhaps first by hydrogen blending, commingling with bio-methane and eventually entirely carbon-free gaseous molecules.

The below graphs demonstrate that fossil gas plays a useful and important role up to some ~65% of decarbonization⁴⁸. Beyond a degree of ~65 % decarbonization, fossil gas declines a ‘green gas’ rises.

Figure 8: Gaseous molecules – first fossil, later ‘green’



⁴⁶ dena-Leitstudie Integrierte Energiewende 2018 (https://www.dena.de/fileadmin/dena/Dokumente/Pdf/9261_dena-Leitstudie_Integrierte_Energiewende_lang.pdf)

⁴⁷ As indicated earlier, ‘green’ stands for all manner of decarbonized gaseous molecules.

⁴⁸ Conform the naming convention of the dena-Leitstudie we see the scenarios ‘all-out-electrification’ (‘EL’) and ‘technical mix’ (‘TM’), explanation of which in detail would go too far for the purposes of this paper.

Source: Hecking/Peters, The underrated long-term relevance of gas

The gas industry understands that the significant contribution of (fossil) gas to advance decarbonization is by no means a 'free ride' for the gas industry to continue business as usual. Rather, the call of the day for the gas industry is to credibly demonstrate that also *during* the phase of the energy transition where fossil gas is usefully deployed, continuous improvements are achieved. NS2 is a prime candidate to deliver exactly that.

3.2 Rising demand against previous 'flat' predictions

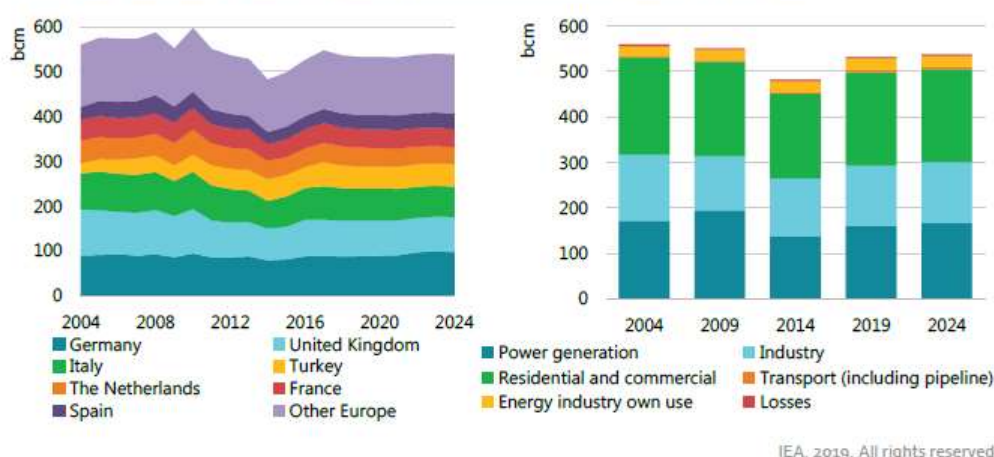
In its WEO 2017 (i.e. looking at 2016), the IEA assumed that European demand would remain flat at ~450 bcm/a in the 2030ies. Already in 2017, we saw demand straddling 520 bcm/a. Meanwhile, the IEA's projections have become somewhat more bullish.

More 'bullish' demand projections

E.g. in its Gas Midterm Outlook 2019 the IEA projected European gas demand at 538 bcm/a in 2024, driven mainly by the phase out of coal- and nuclear power generation⁴⁹. I.e. within a span of two years, the IEA demand projections 'jumped' by almost 100 bcm/a.

Figure 9: More bullish European gas demand

Figure 1.24. Natural gas consumption by country and by sector, Europe, 2004–24



Gas-to-power is the key driver behind incremental gas demand in Europe during the forecast period, as a number of countries phase out nuclear and coal-fired power plants.

Source: IEA Gas Midterm Outlook 2019

A few months later, in its Global Gas Security Review 2019, the IEA emphasizes that in Northwest Europe alone some 45 GW of coal-fired and nuclear baseload power generation would be phased out shortly with further rising demand. Gas will be required to (i) substitute the loss of baseload coal-fired and nuclear baseload generation, (ii) provide the flexibility to meet the seasonal heat pattern and (iii) step in the breach when intermittent renewable power

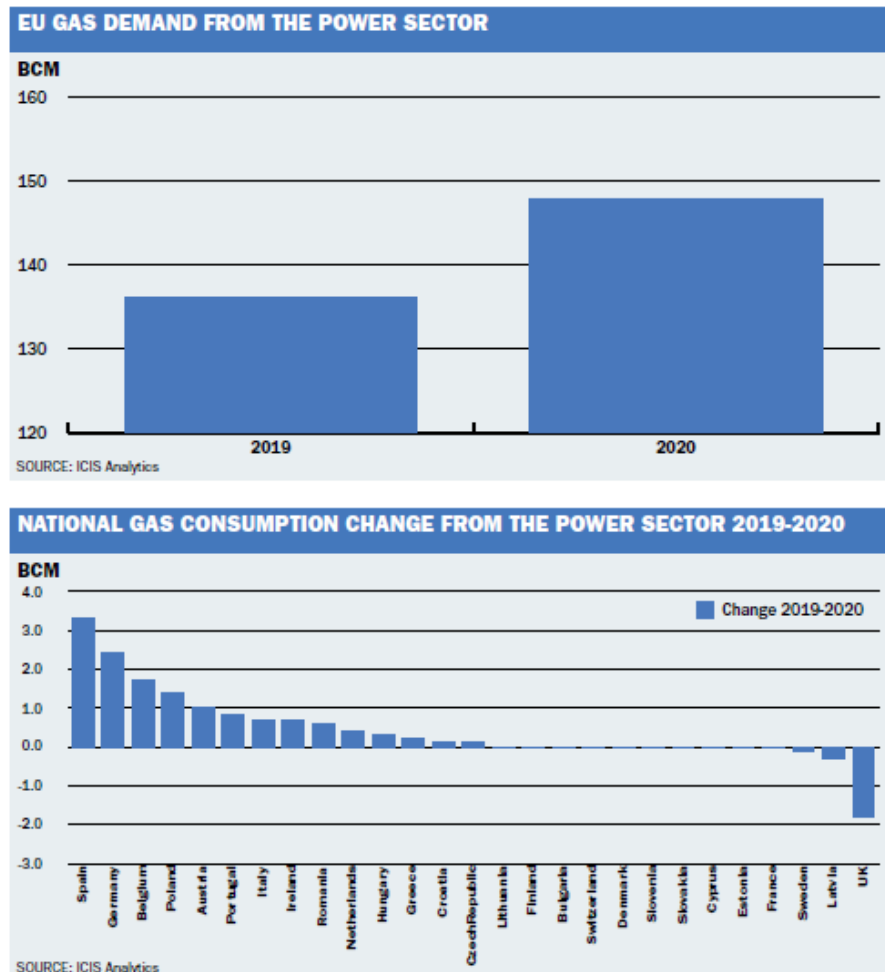
⁴⁹ IEA Gas Midterm Outlook 2019, page 14.

generation does not produce (Kalte Dunkelflaute)⁵⁰, i.e. a 'much closer intimacy between the gas and the power markets'⁵¹.

Market-induced coal-to-gas switching amplifies demand increase

Besides government-imposed phase-outs, accelerated coal-to-gas switching, market-driven by low gas prices coupled with high carbon prices, amplifies the trend of rising gas demand in the power sector. ICIS-Heren estimates that European gas demand for power generation could increase by as much as 12 bcm/a towards a total of 148 bcm/a in 2020 alone.

Figure 10: Gas demand from coal-to-gas switching



Source: ICIS-Heren, GIF 27.03 of 14 February 2020

3.3 Ever widening import demand

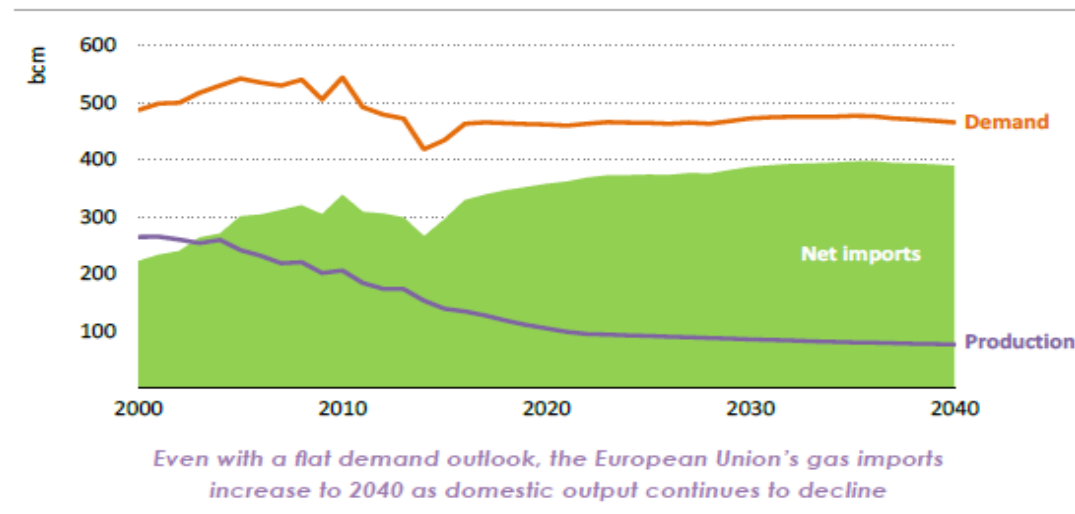
Already in its World Energy Outlook 2017, the IEA projected, with demand at the time assumed to remain flat at some 450 bcm/a, Europe's import requirements to rise to a staggering 390 bcm/a by 2040.

⁵⁰ For explanation of this phenomenon see Hecking/Peters, The long-term relevance of gas, page 21 ff.

⁵¹ IEA GGRS 2019, page 47.

Figure 11: European gas import demand

Figure 8.9 ▶ **Natural gas balance of the European Union in the New Policies Scenario**



Source: IEA WEO 2017

In the face of gas demand *rising* (instead of staying flat) by almost a 100 bcm/a, and *accelerated decline* of indigenous production, the total import needs become even greater. In its GGSR 2019, the IEA reports that Northwest-European import needs rose from 42% in 2008 to 70% in 2018, or by almost 60 bcm/a. The IEA expects that the regions' import requirements are set to increase by an additional 40 bcm/a by 2024⁵². It stands to reason that, by 2030 if not earlier, Europe's total import demand will be way over 400 bcm/a. These are staggering numbers, rendering the fierce opposition against the new import capacity provided by NS2 border-line irresponsible.

4. Concern about dependency on Russia ignores market changes in the last decade

NS2 opponents claim that a further Russian pipeline and hence further Russian gas supplies would increase dependency on Russia and expose Europe to political blackmail. I shall demonstrate that all talk of dependency on Russia is hinging on more than 10 year old circumstances prevailing during the Ukrainian gas crisis of 2009 and is – today – no more than yesterday's news.

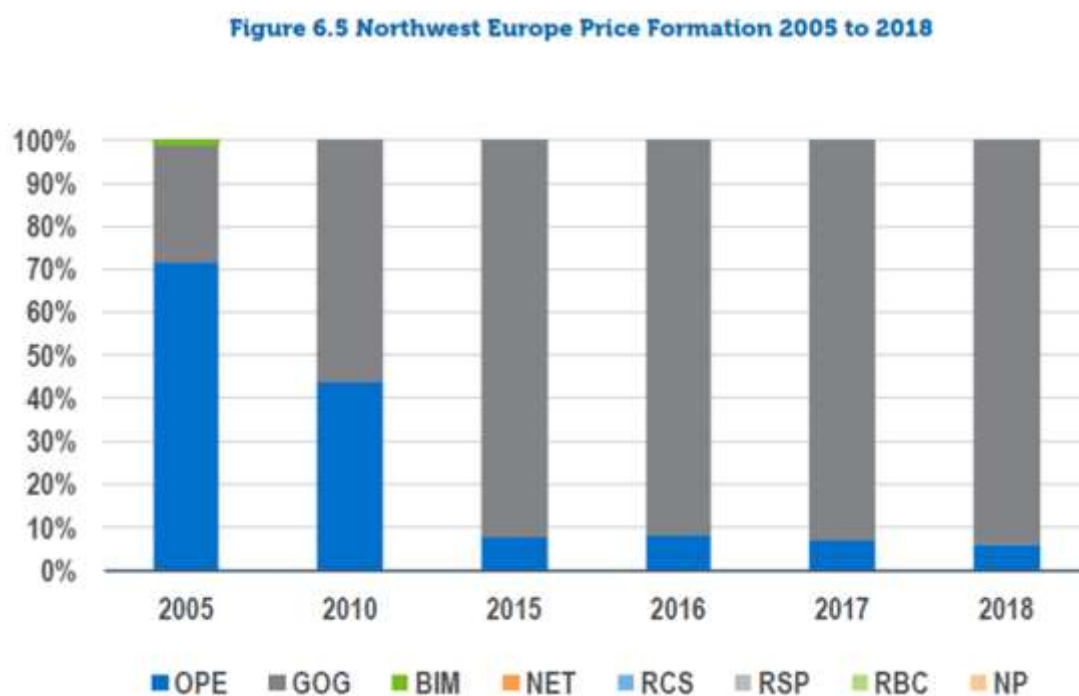
⁵² IEA, GGSR 2019, page 53.

4.1 The (almost completed) 'European Henry Hub' can send out price signals

Price formation performed by traded markets with no price-setting power for importers remaining

Price formation in the European gas market is meanwhile predominantly performed by traded markets, where price formation occurs by supply and demand with no remaining price-setting power of importers, including Russia. This is particularly true for the Northwest-European market (but includes e.g. also the Czech market). The IGU Wholesale Gas Price Survey 2019 assesses gas-on-gas ('GOG') price formation in 2018 at 96%.

Figure 12: Northwest-European gas price formation



Source: IGU Wholesale Gas Price Survey 2019 Edition

Heather and Petrovic describe the Northwest-European market '*... as if it is a single price area, i.e. a fully integrated trans-national market for gas*'⁵³. The price correlation between the various national hubs and the (leading) Dutch TTF is so strong, that at times the spread is smaller than what it would cost to book entry/exit to physically get gas from one hub to another.

This is, i.a., the result of massive changes in the European gas markets in the wake of the 2009 gas crisis shock. European security of gas supply regulation e.g. imposes the N-1 rule, i.e. there must be surplus import capacity in each country equal to its largest source. Interconnection points must be bi-directional, fostering further interconnectivity. It will go too far for the purposes of this paper to describe all features which have transformed the European gas markets into an (almost complete) 'European Henry Hub'. Important is that we are in an entirely different world

⁵³ Heather/Petrovic OIES Energy Insight 13, page 18.

today than we were in 2009. It is therefore misplaced to deal with European energy policy matters as if we were still in 2009.

TTF is the European- and also a global- price benchmark capable of sending price signals

The TTF has firmly established itself as the leading European trading hub. In January 2020 alone it transacted more than 70% of all traded gas in Europe with a turn-over of 4,462 TWh, i.e. almost the entire European annual consumption in one month.

Figure 13: TTF trade turn-over in January 2020



Source: ICIS Heren GIF 27.03 of 14 February 2020

The TTF has become the European price benchmark beyond the Northwest-European market. Moreover, it is evolving as a global price benchmark, e.g. for financial hedging by LNG suppliers and /or buyers⁵⁴. Notably, the latter (financial) use of the TTF has resulted in a churn rate of 70.9, higher than that of the American Henry Hub (53.9)⁵⁵.

In other words, the European market (represented by the globally recognized TTF) will respond to any supply constraint (be it accidentally or intentionally) with rising traded prices, i.e. it will 'send price signals', thereby attracting alternative supplies.

4.2 Europe avails of significant redundant import infrastructure

Europe avails, besides an impressive storage capacity of ~116 bcm, of significant redundant import infrastructure. Redundant means that if a certain import source fails to perform, for whatever reason, there is sufficient alternative capacity to fill the gap.

Most important in this context is Europe's LNG re-gas capacity. It comprises at present some 220 bcm/a, with more capacity being built or planned.

In other words, Europe avails of LNG import capacity larger the entire volume of gas supplied to Europe by Russia.

The question therefore is: If the European market is capable of sending out price signals to attract alternative sources of supply, and avails of redundant infrastructure to receive such

⁵⁴ IEA GGSR 2019, page 18.

⁵⁵ Heather, OIES Energy Insight 55, page 11.

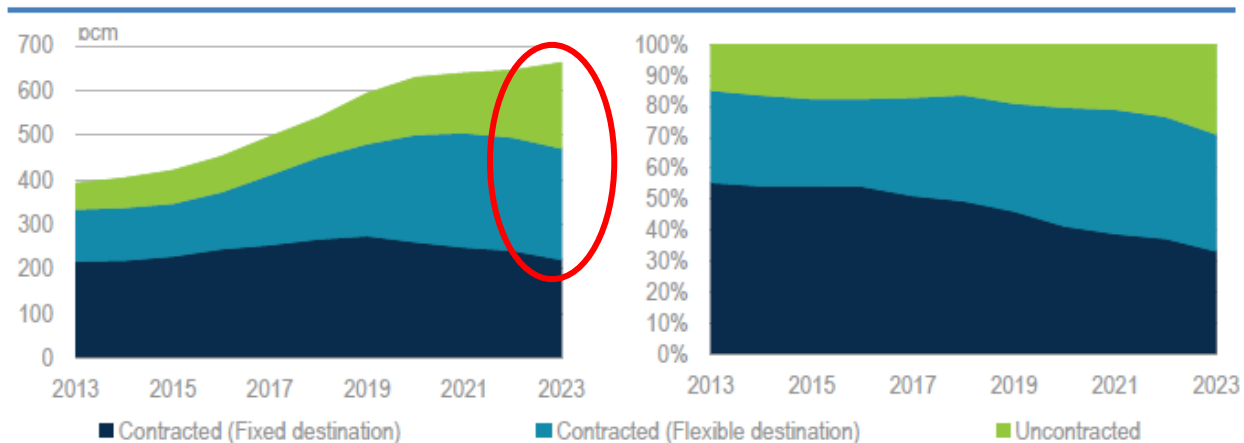
alternative supplies, are there any such alternative supplies readily available to respond to such price signals - and if so, how fast?

4.3 The ever rising abundance of destination-free LNG has fostered a global gas market

Already in its WEO 2016⁵⁶, the IEA spoke of a 'second gas revolution', namely, after the 'shale gas revolution', the '*LNG revolution*', transforming the segmented regional gas markets around the world into a global gas market. Not least fostered by the exponential expansion of U.S. export capacity, a growing volume of destination-flexible or even destination-free supply of LNG emerged - and keeps growing.

Figure 14: Destination-flexible global LNG

Figure 2.13 • LNG export capacity contracted by destination flexibility, 2013-23



Source: IEA analysis based on ICIS (2018), *ICIS LNG Edge* (subscription required).

Source: IEA Global Gas Security Review 2018

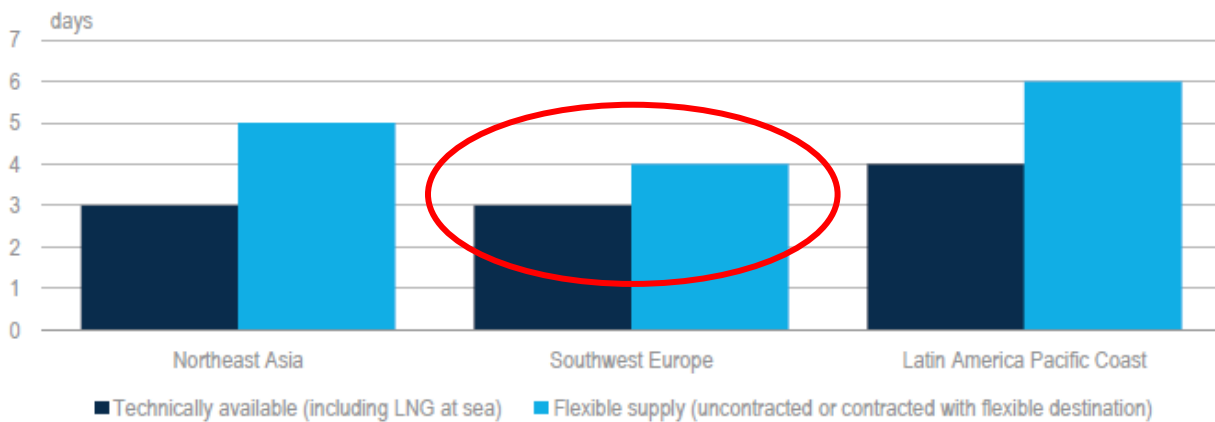
Destination-flexible means that either the seller or the buyer is entitled under its contract to divert an LNG cargo to the destination where it fetches the highest netback. Destination-free means that the volume is not even under contract and hence sitting there ready to go for the highest netback wherever that may be. The IEA projects that, by 2023, there will be more than 400 bcm/a of such supplies available.

Also the response time has come down impressively. The IEA assessed that an unplanned additional cargo can be dispatched within 3 to 4 days.

⁵⁶ IEA WEO 2016, page 161 ff.

Figure 15: LNG response time

Figure ES.1 • Number of days needed to receive and regasify an unplanned additional LNG cargo



Source: IEA Global Gas Security Review 2018

In other words, the water-borne LNG trade with an ever increasing armada of LNG carriers floating around the world has transformed gas into a fungible commodity comparable to crude oil. For Europe, with its redundant import capacities for both pipeline and LNG supplies, it creates the best of two worlds: Both LNG and pipeline suppliers may compete in the European markets keeping prices low. But if Asia pays higher prices, Europe does not have to compete for LNG on a permanent basis due to ample pipeline supplies. At the same time, the availability of destination-flexible LNG responding to price signals puts a ceiling on the maximum achievable prices for pipeline suppliers to Europe: LNG acts as the ‘policeman’. If prices rise such that LNG supplies to Europe become equally or even more attractive than to Asia, LNG would flow to Europe.

4.4 Security of supply transformed to ‘functionality of price signals’

The massive market changes both in Europe and globally have transformed the once ‘bi-lateral physical dependency’ (indeed prevailing in many member states in 2009) into a ‘functionality of price signals’ (prevailing today). Hence, any assertions of dependency on Russia are a myth.

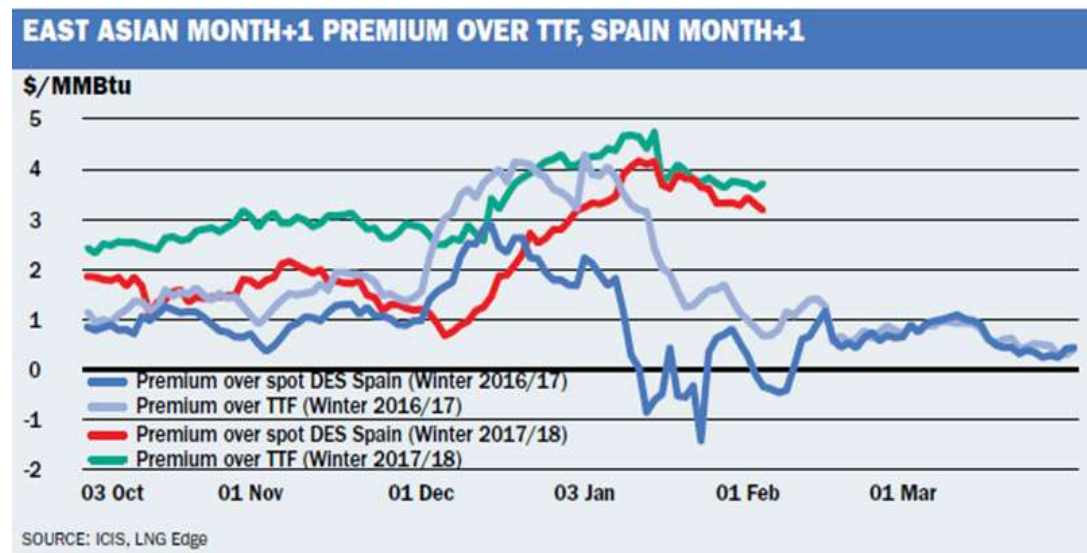
5. ‘Perfect storm’ of supplier competition - European consumers benefit

The European gas market is, with its strong trading markets, high interconnectivity and its redundant import capacity, the ‘perfect storm’ for supplier competition. Supplier competition keeps prices low and thus generates welfare benefits for European consumers. While previously it would do to point out the average price spread between Asian and European markets, the global supply glut which arose since 4Q 2018 requires a stepwise approach in explanation.

5.1 Significant price spread between Asia and Europe until 3Q 2018

Up to the third quarter of 2018, one could look back and claim that, by and large, there was a significant premium on supplies to (East-) Asia. E.g. in winter 2017/2018, the East-Asian premium over TTF price levels exceeded 4.50 \$/MMBtu, i.e. roughly 13.50 €/MWh. In consequence, the bulk of LNG, including U.S. LNG, went to Asia and European LNG terminals were grossly underutilized.

Figure 16: Price spreads Asia/Europe until 3Q'18



Source: ICIS Heren, EGM 25.03 of 15 February 2018

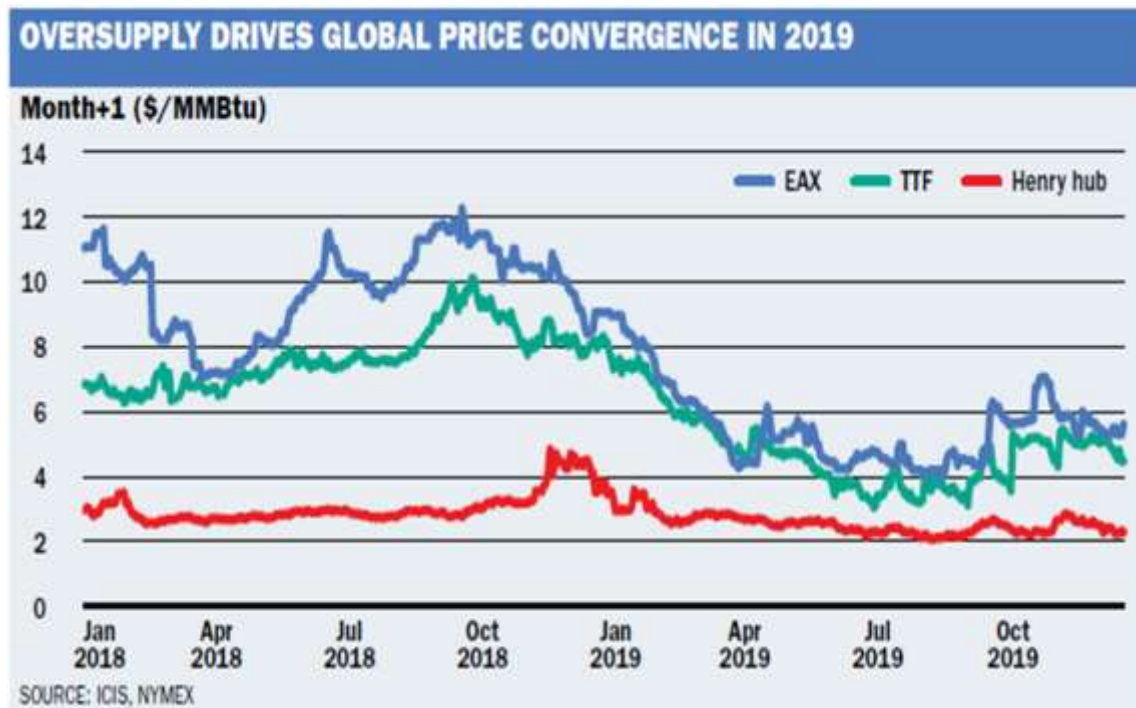
In order to compete for such LNG supplies pricewise, such self-inflicted damage arising if Europe had shut out e.g. Russian pipeline supplies, European consumers would have had to pay a premium of on average ~3.3 \$/MMBtu, i.e. roughly a 10 €/MWh higher price. The lost welfare benefit for European consumers would have been in the order of magnitude of € 50 billion per year⁵⁷. I called the respective recommendation of our American allies to favor (American) 'freedom molecules' over 'malign' (Russian) molecules at the time an 'indecent proposition'.

5.2 Price spread between Asia and Europe collapsed as of 4Q 2018

In true global market fashion, the picture changed when the Asian premium collapsed and it became a matter of transportation cost, where the highest net-back could be achieved. Despite Henry Hub sourcing costs being at record lows, the lower transport costs for Atlantic basin-based LNG suppliers (i.e. particularly U.S. suppliers) made Europe the more attractive destination.

⁵⁷ Ewi, with a more granular approach in its 'ewi impacts of Nord Stream 2' study, arrives at 24.4 billion Euros in the 'high LNG demand' scenario. It does point out however that European wholesale gas prices would be up to 32% higher than with NS2 in place. The author takes liberty in using an 'across the board' European price level approach, leading to the higher number.

Figure 17: Price spreads Asia/Europe collapsed as of 4Q'18

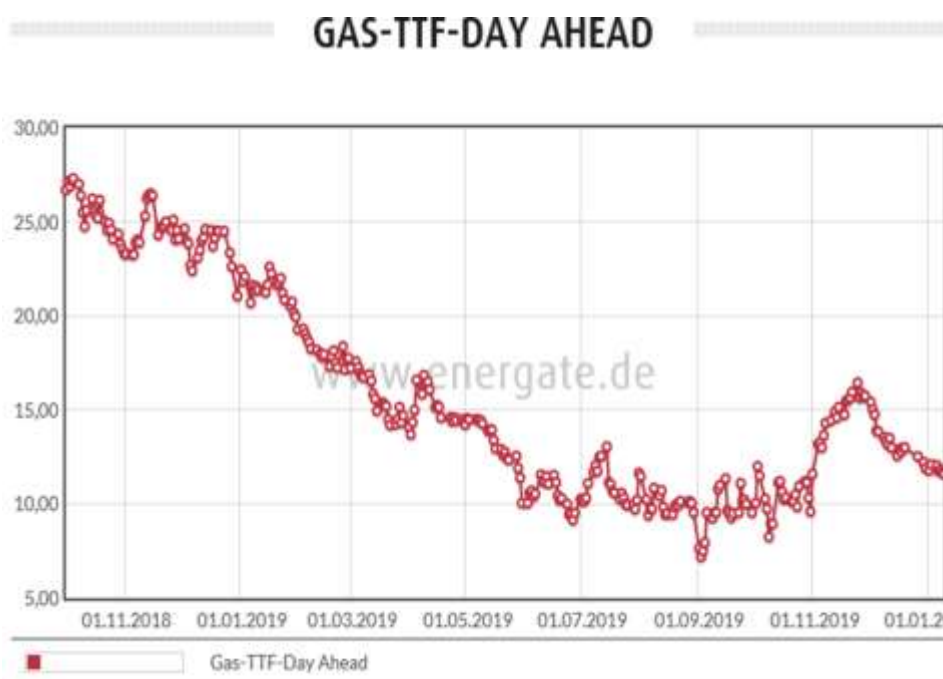


Source: ICIS Heren, GIF 26.23 of 20 December 2019

In consequence, a lot more LNG found its way into Europe in 2019, using the thus far hugely underutilized European regas-terminals and even absorbing arriving supplies beyond grid-demand by putting them into the vast storages.

The resulting competition between pipeline suppliers and LNG suppliers was hugely beneficial for European consumers due to the massive drop in price levels. E.g. the day-ahead price dropped from ~27 €/MWh in October 2018 towards 10 €/MWh (and at times below 10).

Figure 18: Massive price decline since 4Q'18

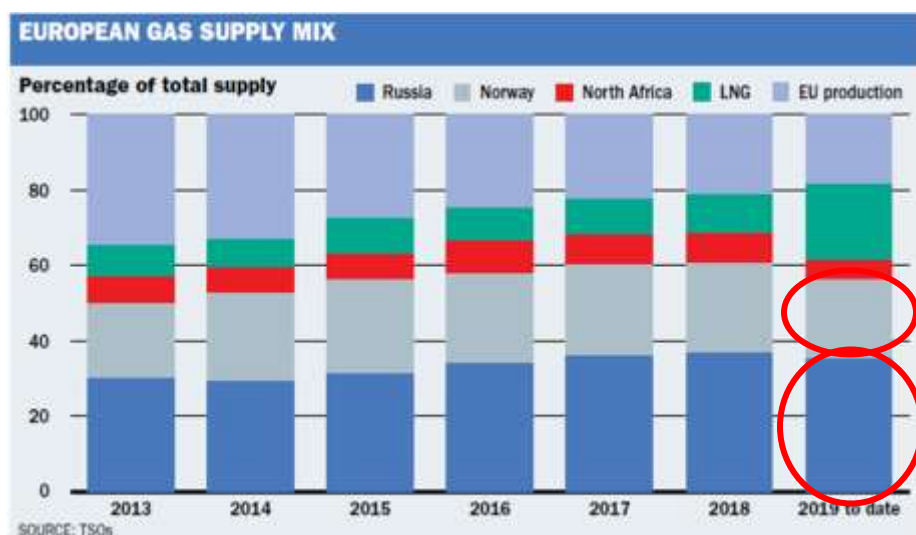


Source: <https://www.energate-messenger.de/markt/preise/62809>

5.3 Gazprom turns 'price-taking' trader: sales outside LTCs trailing TTF

Varied competitive responses of pipeline suppliers were seen. With LNG volumes up significantly and spot prices down, Norwegian volumes shrunk considerably, while Russian year-on-year volumes remained stable.

Figure 19: European gas supply mix

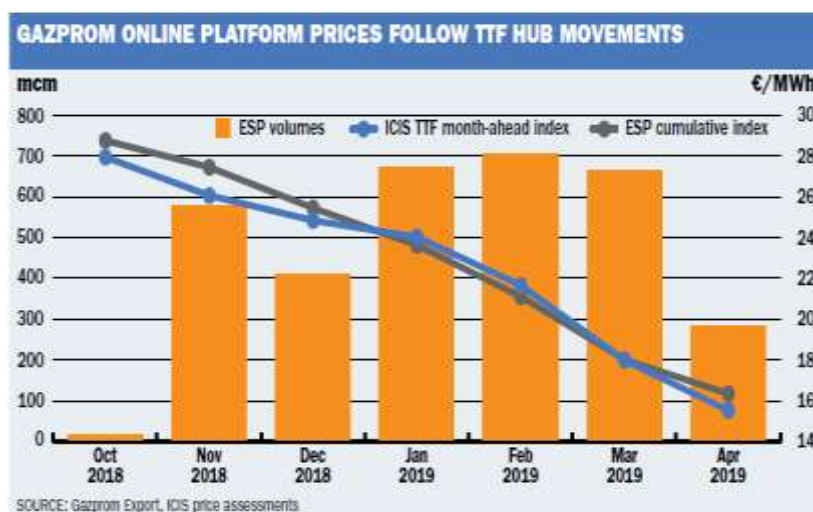


Source: ICIS Heren, GIF 26.23 of 20 December 2019

Norwegian Equinor withheld significant quantities since they considered the market prices ‘too low’.

In contrast, Gazprom, its LTC-volumes affected by down-nominations to min-take levels by their import customers, significantly increased its sales via the so-called ESP (electronic sales platform⁵⁸). Notably, Gazprom’s ESP sales not only comprised all manner of traded products, but also its prices were trailing TTF prices.

Figure 20: Gazprom’s ESP sales



Source: ICIS Heren, GIF 26.07

I consider it far-fetched to qualify such behavior as ‘malign’. Rather, I would regard this as Gazprom submitting to market forces and behaving as ‘price-taker’.

5.4 Asian demand will pick up again

It stands to reason that the current LNG supply glut will dissipate with Asian demand picking up again. Such demand increase could, besides the current large users of LNG (e.g. China, Japan, South-Korea), be propelled by further Asian markets switching to gas in a quest to battle climate change and improve air quality. While there are different projections when this might occur, it is common opinion among experts that Asian demand will pick up in the medium term⁵⁹. This will undoubtedly cause Asian prices to rise once more and attract LNG supplies away from Europe.

With sufficient pipeline import capacity, including the one of NS2, Europe would then still have enough volumes coming to the powerful traded market to which any pipeline supplier will have to submit as a price-taker. While the ability to draw on LNG (in its capacity as ‘policeman’ ensuring the maximum achievable price for a pipeline supplier) remains, the necessity to compete for LNG at the elevated level of Asian prices on a permanent basis would not arise.

⁵⁸ Gazprom’s ESP platform, to which any trader can subscribe (and many have) operates similar to an exchange.

⁵⁹ The IEA speaks of ‘non-traditional emerging Asian buyers’, e.g. Bangladesh, India and Pakistan, see IEA GGRS 2019, page 11 ff.

6. Conclusions

The U.S. sanctions are an entirely unacceptable extra-territorial interference in European energy policy. This alone should suffice to mobilize strong counter-reactions from Europe. While European politicians have thus far reacted to the sanctions through 'outrage by lip-service only', the insight that also European climate goals are obstructed and security of supply is unnecessarily put at risk, should hopefully trigger second thoughts and strengthen the resolve to take unequivocal counteraction.

The amendment of the Third Gas Directive is misusing regulation as a political weapon. In the process, the EC is hampering its own aspirations to battle climate change and may put security of supply unnecessarily at risk. Its potential negative consequences for the operability of NS2 should be alleviated.

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About the Author



Dr. Wolfgang Peters, MBA, Managing Director of ‘The Gas Value Chain Company GmbH’:

Wolfgang has been working in the oil and gas industry for some 37 years: for Mobil Corporation, for Duke Energy and thereafter for RWE. He held senior management positions across the entire value chain in a variety of countries. After some 15 years in the international upstream business, he was i.a. twice responsible for market entry into the liberalizing Dutch retail market. Later, he was engaged in the midstream segment, i.a. as RWE’s chief negotiator for Nabucco supplies in Azerbaijan, Iraq and Turkmenistan. Moreover, he served as CCO and later CEO of RWE Transgas a.s. (later renamed RWE Supply & Trading CZ a.s.) in the Czech Republic from 2008 to 2016. He experienced hands-on the 2009 Ukrainian gas crisis and the ‘break-out’ of traded markets subsequent the financial crisis in 2008. With Gazprom, he negotiated and litigated about the decoupling of oil and gas pricing. He retired as CEO of RWE Supply & Trading CZ a.s. in March 2016. Wolfgang now runs his own company, ‘The Gas Value Chain Company GmbH’ (GVC). GVC offers its services as ‘commercial operator’ (instead of mere consultancy), e.g. in project management and negotiations. Wolfgang also acts as commercial expert in arbitrations and mediations. He strongly supports gas as a means to effectively battle climate change. His gas advocacy engagement has rendered multiple publications and presentations (<http://gasvaluechain.com/news-events-publications/>). Wolfgang has also continued to maintain cooperation with Brussels-based Eurogas (www.eurogas.org), where he served as board member for 8 years: GVC joined Eurogas as its first new ‘liaising member’ in 2016. In September 2019, Wolfgang was appointed Chairman of the Supervisory Board of Česká republika a.s. in Prague.