

Yermakov, Vitaly; Sharples, Jack

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## A phantom menace: Is Russian LNG a threat to Russia's pipeline gas in Europe?

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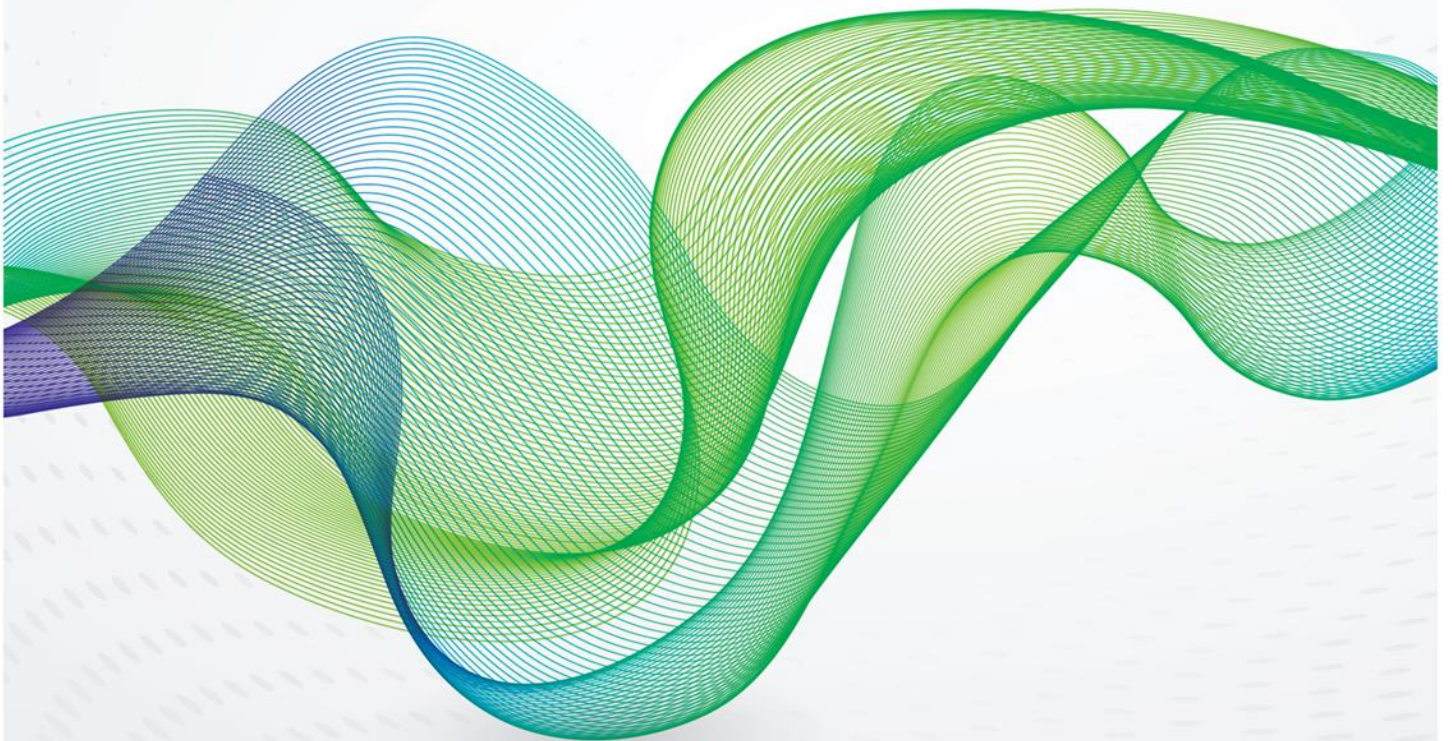
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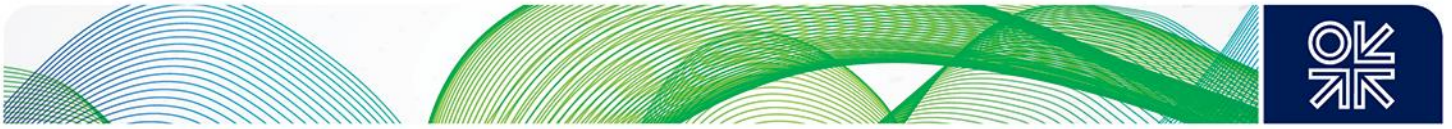
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JULY 2021

# A Phantom Menace:

Is Russian LNG a Threat to Russia's Pipeline Gas in Europe?





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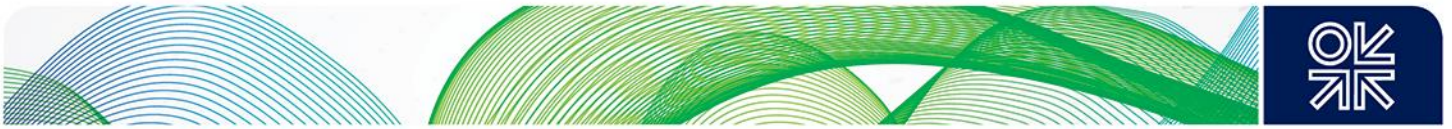


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## Introduction

The development of LNG trade over the past two decades has changed global gas markets: the volume of inter-continental gas trade has grown, while the combination of increased use of destination-free contracts, the rise of portfolio players, the development of infrastructure to re-export cargoes from import terminals, and the growing share of spot trades allows greater flexibility of deliveries than ever before and has challenged the dominance of traditional, destination-specific, oil-indexed, long-term contracts. This growth and development will continue, and it is expected that the share of LNG in global trade will equal the share of pipeline gas trade by the end of the 2030s.<sup>1 2 3</sup> With its plentiful regasification capacity, liquid traded markets, and price-determined ability to absorb cargoes, Europe is now the 'market of last resort' for global LNG. For Russia, LNG is potentially a threat to its established position as the main gas exporter to Europe, but also an opportunity to open up new markets that lie out of reach for existing and planned Russian export pipelines. The Kremlin appears to have realised that Russia's legacy pipeline-dominated export model is no longer optimal in the emerging global gas market, in which LNG is set to have the largest share of the growth in gas trade over the coming decades.<sup>4</sup>

The Russian authorities also appear to acknowledge that the state-controlled gas giant, Gazprom, does not have the flexibility and expertise to exploit this expanding market, and have supported a smaller, nimbler, and more commercially efficient player to be their national champion in the LNG world. Having received significant state support, both financial and political, Novatek has grasped the opportunity and has so far delivered on all its promises: At Yamal LNG, Novatek's flagship project, the first three trains were launched between December 2017 and November 2018, on budget and ahead of schedule. The project has performed well and demonstrated its competitiveness under adverse market conditions in 2020. Novatek's next project, Arctic LNG 2, reached FID in September 2019 and is planned to be launched in several stages between 2023 and 2026.<sup>5 6</sup> Novatek's expansion program is the core of Russia's overall LNG plans that envision the country exporting 80-140 million tonnes per annum (mtpa) in the early 2030s,<sup>7</sup> which would make Russia one of the 'Big Four' LNG exporters, alongside the USA, Qatar, and Australia.<sup>8</sup>

Russia's LNG ambitions grew even bigger in 2021, with the publication of its official long-term LNG development plan. In addition to the five LNG projects either already in operation or under construction, that plan lists a further seven 'probable or possible' projects that would take Russian LNG production up to 140 mtpa. Finally, the plan also lists another seven speculative projects whose probably 'cannot be estimated', but which, if all implemented, would add a further 127-143 mtpa, thus raising Russian LNG production to 267-280 mtpa (the full list is given in Appendix 1). By no means will all these projects be realised, but the list does illustrate the scale of the LNG ambitions of both the Russian government

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<sup>1</sup> International Gas Union (IGU), 2020. *Global Gas Report 2020*. August 2020. [https://www.igu.org/wp-content/uploads/2020/08/GGR\\_2020.pdf](https://www.igu.org/wp-content/uploads/2020/08/GGR_2020.pdf) (see page 41, Figure 36 - LNG to surpass pipeline gas in international trade by 2030)

<sup>2</sup> McKinsey, 2021. *Global Gas Outlook to 2050*. February 2021. <https://www.mckinsey.com/~/media/mckinsey/industries/oil%20and%20gas/our%20insights/global%20gas%20outlook%20to%202050/global-gas-outlook-2050-executive-summary.pdf> (see page 5 - LNG to surpass pipeline gas in international trade by 2035)

<sup>3</sup> Shell, 2021. *LNG Outlook 2021*. February 2021. [https://www.shell.com/promos/energy-and-innovation/download-the-shell-lng-outlook-2021/\\_jcr\\_content.stream/1614823770264/2b5b3fdaa9feba85dad9b3408c200f26eadf85f/lng-outlook-2021-final-pack-updated.pdf](https://www.shell.com/promos/energy-and-innovation/download-the-shell-lng-outlook-2021/_jcr_content.stream/1614823770264/2b5b3fdaa9feba85dad9b3408c200f26eadf85f/lng-outlook-2021-final-pack-updated.pdf) (see page 11 - LNG to surpass pipeline gas in international trade by 2040)

<sup>4</sup> See Henderson J. and Yermakov V. *Russian LNG: Becoming a Global Force* OIES Paper, Oxford, 2019. <https://www.oxfordenergy.org/publications/russian-lng-becoming-a-global-force/>

<sup>5</sup> Novatek, 2021. *Arctic LNG*. <https://www.novatek.ru/en/business/arctic-lng/>

<sup>6</sup> Reuters, 2021. Russia's Novatek approves Arctic LNG 2 financing of \$11 bln by end-Q2. *Reuters*, 23 April. <https://www.reuters.com/business/energy/russias-novatek-approves-arctic-lng-2-financing-11-bln-by-end-q2-2021-04-23/>

<sup>7</sup> Government of the Russian Federation, 2020. *Energy Strategy of the Russian Federation for the Period to 2035*. <https://minenergo.gov.ru/node/1026> p.80

<sup>8</sup> For comparison, data from Kpler states that LNG exports in 2020 were as follows: Qatar (79.6 mt), Australia (79.0 mt), and United States (48.3 mt). Russia ranked fourth, with exports of 31.3 mt.



and Russian energy companies.<sup>9</sup> For comparison, Russia currently has three operational LNG export terminals: Sakhalin-2 (9.6 mtpa), Yamal LNG (16.5 mtpa), and Vysotsk LNG (0.7 mtpa), which have a combined nameplate export capacity of 26.8 mtpa.

Despite all these plans and the success of Novatek's Yamal LNG project to date, one key concern remains for Russia's policymakers, namely that independent (i.e., non-Gazprom) LNG exports might compete with Russian pipeline exports, especially to traditional European consumers, and thus cannibalise Gazprom's existing market share. These anxieties are exacerbated by Novatek's expansion plans to increase its LNG production up to 57-70 mtpa by 2027-2030, up from 19 mtpa in 2019 and 2020.<sup>10</sup> These volumes will be split between Europe and Asia, and despite the notion in principle that volumes delivered to Europe could be trans-shipped and exported onwards to Asia (for example, during the winter months when the Northern Sea Route is impassable), there are no guarantees that these volumes will not, in fact, remain in Europe where they could compete with Gazprom's pipeline gas supplies. Once the ownership of cargoes has passed from Novatek either to its own customers or to those companies that have offtake contracts for Novatek's LNG export terminals (such as Total and CNPC at Yamal LNG<sup>11</sup> and Total, CNPC, CNOOC, and Japan Arctic LNG [Mitsui & Jørgensen] for Arctic LNG 2<sup>12</sup>), the matter of where this LNG can be marketed is beyond Russia's control.

Therefore, the aim of this paper is to review the split in Russian LNG exports both between Europe and Asia, and regionally within Europe, since 2018, examine how the geographical distribution of Russian LNG might evolve through the 2030s, and assess the merits of the policy proposals by Gazprom to introduce rules that would allow the Russian state to "manage" the competition between Russian pipeline gas and Russian LNG in Europe.

Our main conclusion is that Russian LNG indeed competes with Gazprom pipeline deliveries in North-West Europe, but so does LNG from other importers. In fact, Europe's supply options are well diversified, and should Russian authorities attempt to artificially limit the deliveries of Russian LNG to Europe, this would simply help Russia's competitors to gain market share. It is really the state of the global LNG market that is going to determine the level of competition, and this is beyond Russia's control.

## 1. Context: Russia on an international gas market transformed by LNG

Russia is the world's largest pipeline gas exporter.<sup>13</sup> Historically, Russian gas exports have meant one thing only: Gazprom supplies to Europe via pipeline. Infrastructure built during the Soviet era and new, post-Soviet, pipelines bypassing transit countries have facilitated increasing volumes of Russian gas exports to Europe,<sup>14</sup> culminating in record physical deliveries of around 194 bcm per year in 2017, 2018, and 2019, before falling to 162 bcm in 2020 (see the table in Appendix 5).<sup>15</sup>

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<sup>9</sup> Russian long-term LNG development program, introduced by RF Government Order #640 of 16 March 2021 <https://in.minenergo.gov.ru/zakony-i-dokumenty/rasporyazhenie-pravitelstva-rf-ot-16-03-2021-n-640-r> (see sections 4 to 7, on pages 6-9)

<sup>10</sup> Novatek, 2020. *Unlocking Arctic Potential: Expanding Our Global LNG Footprint to 2030*. Presentation to Investors, June 2020. [https://www.novatek.ru/common/upload/doc/IR\\_June\\_2020\\_Investor\\_Meetings.pdf](https://www.novatek.ru/common/upload/doc/IR_June_2020_Investor_Meetings.pdf) (see pages 17-18); Data on Yamal LNG production in 2019 and 2020 from Kpler

<sup>11</sup> Yamal LNG, 2021. *About the project*. <http://yamallng.ru/en/project/about/>

<sup>12</sup> Platts, 2021. Arctic LNG 2 partners conclude 20-year LNG purchase deals: Novatek. *Platts*, 28 April. <https://www.spglobal.com/platts/en/market-insights/latest-news/shipping/042821-arctic-lng-2-partners-conclude-20-year-lng-purchase-deals-novatek>

<sup>13</sup> In 2019, Russia exported 217 bcm of natural gas by pipeline. The only other exporters to exceed 40 bcm of pipeline exports were Norway (109 bcm), the United States (75 bcm), and Canada (73 bcm). Source: BP, 2020. *Statistical Review of World Energy*. <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2020-full-report.pdf> See page 43

<sup>14</sup> 'Europe' is defined as the EU-27 plus the UK, Switzerland, non-EU Balkans, and Turkey

<sup>15</sup> Data on physical pipeline deliveries from Russia to Europe excluding Turkey sourced from the ENTSOG Transparency Platform and data on Russian supplies to Turkey sourced from the Energy Market Regulatory Agency (EMRA) of the Republic of Turkey via Argus



The expansion of Gazprom's exports entails the construction of new pipelines: To Europe, the Turkish Stream pipeline under the Black Sea to Turkey was completed in January 2020 (with onward connections to South-Eastern Europe being developed in 2020 and 2021<sup>16</sup>) and the Nord Stream 2 pipeline is in the final stages of construction, with the onward connection (the EUGAL pipeline in Germany) ready to receive supplies.<sup>17 18</sup> To Asia, the Power of Siberia pipeline – from Gazprom's gas fields in Eastern Siberia – formally launched in December 2019. Deliveries via the Power of Siberia totalled 4.1 bcm in 2020, and are expected to reach 10 bcm in 2021, as part of a plan to ramp up to the full capacity of 38 bcma by 2025.<sup>19</sup>

Gazprom's next big Asia-oriented pipeline project is the Soyuz-Vostok ('Union East') pipeline, with a planned capacity of up to 50 Bcma. As the latest variation of Power of Siberia 2 project, its route aims to connect the established production base in Western Siberia with Northern China via a pipeline transiting Mongolia - the previous plan for Power of Siberia 2 envisioned a direct connection to eastern China via Russia's Altai region.<sup>20</sup>

However, the global gas market has changed dramatically since the launch of Russian pipeline gas exports in the late 1960s. Specifically, it has become a more global business thanks to the emergence and expansion of LNG trade, especially over the past decade. In 2009, that global LNG trade amounted to 186 million tonnes (the equivalent of 253 bcm of natural gas). By 2020, it had doubled to 366 million tonnes (498 bcm of natural gas equivalent). Of that 2020 figure, Europe<sup>21</sup> imported 83 million tonnes of LNG (114 Bcm), and Asia – 249 million tonnes (334 Bcm).<sup>22</sup>

LNG cargoes are relatively fungible and flexible: regarding the former, the minor variations in the calorific values of gas from different locations are far less consequential than the physical differences between grades of crude oil refined products, while regarding the latter there is embedded flexibility in the physical act of moving a vessel from one port to another compared to delivery via the fixed routes of pipelines, and there is flexibility in trade embedded in spot cargoes and the continuous recalibration of shipments undertaken by portfolio suppliers. Therefore, LNG cargoes can be easily traded and transported between regions, breaking the dominant role that pipelines long enjoyed and threatening market shares of incumbent suppliers.<sup>23</sup>

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<sup>16</sup> Platts, 2021. Russia's TurkStream link continues to redraw SE European gas map. *Platts*, 8 February. <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/020821-russias-turkstream-link-continues-to-redraw-se-european-gas-map>

<sup>17</sup> Elijah, D., 2021. Nord Stream 2 gas pipe: first flows and alternative supply routes in case of delays. *ICIS*, 22 June. <https://www.icis.com/explore/resources/news/2021/06/22/10654960/nord-stream-2-gas-pipe-first-flows-and-alternative-supply-routes-in-case-of-delays>

<sup>18</sup> EUGAL, 2021. EUGAL: Full Capacities Available. *Press Release*, 1 April. <https://www.eugal.de/en/media-library/press-releases/press-release/eugal-volle-kapazitaeten-stehen-bereit-1>

<sup>19</sup> Platts, 2021. Russia's Gazprom sees 2020 gas sales slide 8.1% after tumultuous year. *Platts*, 16 February. <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/021621-russias-gazprom-sees-2020-gas-sales-slide-81-after-tumultuous-year>

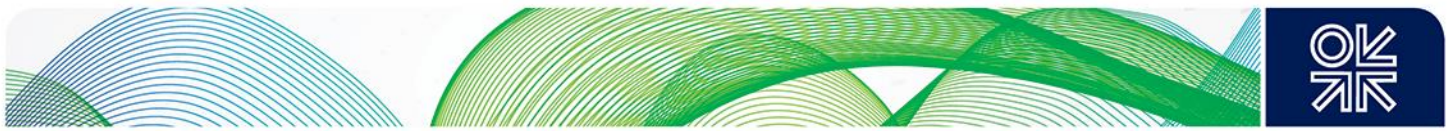
<sup>20</sup> Gazprom, 2021. Feasibility analysis approved for Soyuz Vostok gas pipeline construction project. *Press Release*, 12 April. <https://www.gazprom.com/press/news/2021/april/article526670/>

<sup>21</sup> The EU-27, plus the UK and Turkey

<sup>22</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>23</sup> An interesting example of this flexibility and recalibration of LNG cargoes is the voyage of the ENGIE-owned LNG tanker, *Gaselys*, in January 2018. An LNG cargo from Yamal LNG was brought to the Isle of Grain import terminal in the UK, unloaded into the terminal storage tanks, and then reloaded onto the *Gaselys*. The *Gaselys* departed the Isle of Grain on 5 January, appeared to head into the Mediterranean (as if to deliver the cargo on to Asia), but changed course on 10 January and set out across the Atlantic. Having traversed two-thirds of the Atlantic, the vessel made several changes of course in the space of several days, before it finally turned back towards the United States and discharged its cargo at the Everett LNG import terminal (Boston) on 28 January.





## 2. Russia adjusts its gas strategy to reflect growing LNG ambitions

As a result of the dramatic changes in the global gas market driven by rapidly-growing volumes of flexible LNG trade, Kremlin strategists needed to re-assess Russia's gas export strategy. From a political as well as a commercial perspective it became increasingly clear that if Russia were to retain its status as a major global gas player it would have to play a much greater role in the LNG business as well as in pipeline gas. Many of the major gas markets in Asia, for example Japan, South Korea, and Taiwan, can only be accessed by sea, while others such as China, India, and Vietnam see LNG as a core part of their gas strategy. If Russia is to access any or all of these markets it must be a significant LNG player.

The Russian Energy Strategy to 2020 (published in 2003) foresaw that "in the second half of the forecast period, Russia could enter the global LNG market" and identified the United States as a prospective market for LNG exports.<sup>24</sup> At that time, the Russian government very much saw LNG as a project for the future. By the time the Russian Energy Strategy to 2030 was published in 2010, Russia's first LNG export terminal (Sakhalin-2) had been operational for a year, and Russia's forecast participation in the global LNG market had become reality.

The updated strategy document of 2010 stated the aim that LNG exports should account for 14-15 per cent of total gas exports by 2030, with the government aiming for total exports to reach 349-368 bcma by that date.<sup>25</sup> This implies that Energy Strategy to 2030 aimed for LNG exports to reach 49-55 bcma (36-40 mtpa) by 2030. In the Energy Strategy to 2035 (published in 2020), the revised aim was for the production of 46-65 mtpa by 2024, and 80-140 mtpa by 2035.<sup>26</sup> This implies a significant scaling up of Russia's LNG ambitions for the 2020s and 2030s in the decade between the two publications of the two Energy Strategy documents, in 2010 and 2020.

The latest indication of Russia's high hopes is the official long-term LNG development plan released in March 2021.<sup>27</sup> In addition to 28 mtpa of LNG export capacity currently in operation, that document lists 21 mtpa of capacity under construction, 63 mtpa of 'probable' capacity additions, and 25 mtpa of 'possible' capacity additions. Finally, projects totalling a further 131-147 mtpa are classed as 'Projects Whose Probability Cannot Be Estimated at the Current Time' (see Appendix 1). Here it is notable that while Novatek has 65 mtpa of capacity either under construction, probable, or possible, Gazprom has just 20 mtpa of capacity in those categories and Rosneft just 6 mtpa. By contrast, all of the projects whose probability cannot be estimated are being developed by either Gazprom (53 mtpa) or Rosneft (79-94 mtpa).

The government target of 80-140 mtpa of LNG exports by 2035 requires the addition of 31-91 mtpa of LNG production capacity, beyond capacity that is either already operational or under construction. In the conservative scenario, that means half of the 'probable' capacity additions are sufficient to meet the target, while in the most optimistic scenario, all of the 'probable' and 'possible' projects, or several of the projects of uncertain probability would be required. If the Energy Strategy 2035 target is met, Russia's overall LNG exports could be roughly equal to Russia's pipeline gas exports by 2040, although this remains speculative.

During the drafting of the Energy Strategy to 2035 (2020) and LNG Development Strategy (2021), Gazprom and Novatek lobbied behind closed doors in support of their positions: Gazprom wanted to protect its monopoly position as a supplier of Russian gas to Europe, while Novatek wanted support in realising its LNG expansion vision. In public, at least, the debate came to a head in April 2019. The

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<sup>24</sup> Government of the Russian Federation, 2003. *Energy Strategy of the Russian Federation for the Period to 2020*. [http://www.energystrategy.ru/projects/ES-28\\_08\\_2003.pdf](http://www.energystrategy.ru/projects/ES-28_08_2003.pdf) (see pages 52 and 55)

<sup>25</sup> Government of the Russian Federation, 2010. *Energy Strategy of the Russian Federation for the Period to 2030*. [http://www.energystrategy.ru/projects/docs/ES-2030\\_%28Eng%29.pdf](http://www.energystrategy.ru/projects/docs/ES-2030_%28Eng%29.pdf) p.136 & p.141

<sup>26</sup> Government of the Russian Federation, 2020. *Energy Strategy of the Russian Federation for the Period to 2035*. <https://minenergo.gov.ru/node/1026> p.80

<sup>27</sup> Russian long-term LNG development program, introduced by RF Government Order #640 of 16 March 2021 <https://in.minenergo.gov.ru/zakony-i-dokumenty/rasporyazhenie-pravitelstva-rf-ot-16-03-2021-n-640-r>



straw that appears to have broken the camel's back was a public appeal from rector of the St Petersburg Mining University, Vladimir Litvinenko, to President Vladimir Putin, in which he proposed creating an 'LNG cluster' in the Russian Arctic around the Yamal and Gydan Peninsulas, with an eventual production capacity of up to 140-150 mtpa. The proposal was seen as significant due to the close connections between Litvinenko and President Putin: Litvinenko has been the Rector of the St Petersburg Mining University since 1994, and reportedly chaired the committee that awarded President Putin his PhD in economics from that same university in 1997, as well as being President Putin's PhD supervisor. Litvinenko was reportedly also Putin's campaign manager in St Petersburg for the Presidential elections of 2000, 2004, and 2012.<sup>28 29</sup> Putin's PhD thesis was written on the subject of 'Strategic planning of the reproduction of the region's mineral resource base in the context of the formation of market relations (St Petersburg and Leningrad Region). Putin expanded upon this in a 1999 article, 'Mineral Natural Resources in the Strategy for Development of the Russian Economy', which was published in *Journal of the Mining Institute* (the journal of the St Petersburg Mining University).<sup>30</sup> Putin's familiar relationship with Litvinenko, and the academic subject matter that brought them together, certainly suggests that Litvinenko 'has the ear' of the President on this particular topic. President Putin reportedly passed the idea of the LNG cluster on to the Ministry of Energy, and the target of 80-140 mtpa of LNG production by 2035 was included in Russia's Energy Strategy to 2035.<sup>31</sup>

The 'perfect storm' of substantial volumes of non-Gazprom Russian LNG arriving in Europe with support at the highest political level in Russia led to a sharp reaction from Gazprom. In early April 2019, Vitaly Markelov, deputy head of Gazprom, published an open letter in which he accused Novatek of undermining Gazprom's positions in Europe and denying the state budget tax revenues. Leonid Mikhelson, Chairman of the Board of Novatek, retorted: "Russia's Prime Minister and Russia's President have one opinion [regarding Russian LNG], but Mr. Markelov seems to have a quite different one, his own, independent opinion. One can only respect such bold views from a man!"<sup>32</sup>

The 'War of Words' continued following the publication of the Energy Strategy to 2035, in June 2020. In November 2020, Markelov publicly insisted that the aim of Russia's LNG strategy was to diversify away from Europe, and, therefore, Russian LNG should be sent to Asia and used for opening up new markets rather than competing for the shrinking European demand with Gazprom. To this end, he argued that the state should introduce LNG export licenses that could only be issued to Russian LNG producers who had signed long-term contracts (no less than 10 years) with specified delivery points outside of area of supply of Russian pipeline gas for at least 50 percent of their LNG plants' output.<sup>33</sup> Then, in February 2021, Gazprom reaffirmed its position that it "supports development of the LNG sector in Russia to diversify sales' markets... provided there is no competition between Russian gas suppliers externally".<sup>34</sup>

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<sup>28</sup> Schrek, C., 2017. The Moneyed Professor: Putin's Dissertation Adviser Reportedly Now A Billionaire. *Radio Free Europe/Radio Liberty*, 24 July.

<sup>29</sup> President Putin's dissertation was titled, "Стратегическое планирование воспроизводства минерально-сырьевой базы региона в условиях формирования рыночных отношений: Санкт-Петербург и Ленинградской области" ("Strategic planning of the reproduction of the region's mineral resource base in the context of the formation of market relations: St. Petersburg and Leningrad. region"). See: <https://www.dissertcat.com/content/strategicheskoe-planirovanie-vosproizvodstva-mineralno-syrevoi-bazy-regiona-v-usloviyakh-for>

<sup>30</sup> Путин В. В., 1999. Минерально-сырьевые ресурсы в стратегии развития российской экономики. *Записки Горного Института*, 144, 3-9. (Putin, V. V., 1999. Mineral resources in the development strategy of the Russian economy. *Journal of the Mining Institute*, 144, 3-9). See: <https://pmi.spmi.ru/index.php/pmi/article/view/14827>

<sup>31</sup> Toporkov, A., and Chervonnaya, A., 2019. «Газпром» оценил потери бюджета от проекта «Ямал СПГ» в \$440 млн (Gazprom estimated budget losses from the Yamal LNG project at \$440m. *Vedomosti*, 8 April. <https://www.vedomosti.ru/business/articles/2019/04/08/798628-gazprom-otsenil>

<sup>32</sup> Interfax, 2019. НОВАТЭК не согласился с сомнениями Газпрома насчет СПГ-кластера в Арктике (NOVATEK disagrees with Gazprom's doubts about the LNG cluster in the Arctic). Interfax, 9 April. <https://www.interfax.ru/business/657641>

<sup>33</sup> Interfax, 2020. Газпром хочет обусловить право экспорта СПГ сбытом в Азии. Обзор (Gazprom wants to make the right to export LNG conditional on sales in Asia. Overview). Interfax, 20 November. <https://www.interfax.ru/business/738046>

<sup>34</sup> Kobzeva, O., 2021. Russian LNG, natural gas shouldn't compete in export markets, Gazprom says. *Reuters*, 25 February. <https://www.reuters.com/article/russia-gas-lng-idUSL8N2KV4SP>



However, the most recent reports suggest that the Russian government is firmly on the side of LNG expansion, despite Gazprom's reservations. On 14 May 2021, Russia's Energy Minister, Nikolay Shulginov, publicly referred to the notion of competition between Russian pipeline and LNG supplies as "far-fetched", and instead suggested that the primary competition in Europe was between Russian pipeline supplies and LNG deliveries from the United States and Qatar.<sup>35</sup> Then, just three days later, in his meeting with Leonid Mikhelson, President Vladimir Putin told the Novatek Chairman that he supported the company's activities and LNG expansion plans, and did not mention the issue of Novatek's LNG competing with Gazprom.<sup>36</sup> The die is now cast: Over the past decade, the Russian government's LNG ambitions have grown, and it has sought to develop policies that could realise those ambitions, even if it means partially dismantling Gazprom's position as the 'single export channel' for Russian gas.

### 3. From strategy to policy: the Russian regulatory context and the right of non-Gazprom companies to export LNG

The change in government regulation of gas exports from Russia over the past decade reflects this scaling up of LNG ambitions. Until relatively recently, a core element of Russia's gas export strategy has been a state monopoly over gas exports and the concept of a "single export channel" (a unified set of contractual and pricing arrangements for Russian gas sales abroad), with state-owned Gazprom the vehicle for implementing this strategy. This strategy has evolved over time, but its main features have been the interrelated goals of defending Russia's existing export market shares, opening up new gas markets, and pre-empting competition from other sources of gas supply. Gazprom historically *de facto* controlled Russian pipeline gas exports, but the gas export monopoly was only established *de jure* in the Law on Gas Exports of 1 August 2006.<sup>37</sup>

The 2006 law legalized the *de facto* export monopoly that Gazprom already had with pipeline gas, explicitly extending this into the future for all gas exports, except those conducted within the framework of existing Production Sharing Agreements (PSAs), namely the Sakhalin-1, Sakhalin-2, and Kharyaga projects. In addition, the law extended Gazprom's export monopoly to LNG. This provision effectively eliminated competing supplies of natural gas out of Russia into world markets that would bypass Gazprom.

This law remained unchanged until 1 December 2013, when it was amended to allow companies other than Gazprom to export LNG under certain specific circumstances.<sup>38</sup> As a result of this change, four categories of companies now have the legal right to export gas from Russia - the first two (Gazprom and the grandfathered PSAs) held that right prior to 1 December 2013, and the latter two gained the right on 1 December 2013:

1. **Gazprom/Gazprom Export.** The owner of the Unified Gas System (Russia's national gas transmission system) and its 100 per cent-owned subsidiaries (essentially, Gazprom and Gazprom Export) can export gas (pipeline or LNG) from any source (including any onshore gas fields), whether the licensee of such gas fields is Gazprom or any other producer. Crucially, the owner of the Unified Gas Supply System (or its 100 per cent-owned subsidiaries) have "the exclusive right to export natural gas in the gaseous state".<sup>39</sup>

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<sup>35</sup> TASS, 2021. Competition between Russia's LNG, pipeline gas in Europe far-fetched, says Energy Ministry. TASS, 14 May. <https://tass.com/economy/1289699>

<sup>36</sup> President of the Russian Federation, 2021. Meeting with NOVATEK Board Chairman Leonid Mikhelson. Press Release, 17 May. <http://en.kremlin.ru/events/president/news/65587>

<sup>37</sup> Федеральный закон от 18.07.2006 г. № 117-ФЗ - Об экспорте газа (Federal Law of 18.07.2006 № 117-F3 – On the export of gas). <http://www.kremlin.ru/acts/bank/24036> (see Article 3, sub-section 1)

<sup>38</sup> Федеральный закон от 30.11.2013 г. № 318-ФЗ – О внесении изменений в статьи 13 и 24 Федерального закона "Об основах государственного регулирования внешнеторговой деятельности" и статьи 1 и 3 Федерального закона "Об экспорте газа" (Federal Law No. 318-F3 of 30.11.2013 № 318-F3 - On amendments to Articles 13 and 24 of the Federal Law "On the Fundamentals of State Regulation of Foreign Trade Activity" and Articles 1 and 3 of the Federal Law "On Gas Export"). <http://ips.pravo.gov.ru:8080/default.aspx?pn=0001201312020001>

<sup>39</sup> Федеральный закон от 18.07.2006 г. № 117-ФЗ - Об экспорте газа (Federal Law of 18.07.2006 № 117-F3 – On the export of gas). <http://www.kremlin.ru/acts/bank/24036> (see Article 3, sub-section 1)



2. **Grandfathered PSAs.** The pre-existing exemption for exports of LNG produced by grandfathered PSA projects also remains in place.
3. **Owners of mineral licenses to deposits of federal significance that had (as of 1 January 2013) provisions in their licenses for the construction of LNG plants or gas delivery to such plants.** Novatek's licenses for South Tambeykoye (the resource base for Yamal LNG) and Utrenneye (the resource base for Arctic LNG 2) contained the relevant LNG provisions. Novatek subsequently formed international consortia to develop the projects (see below). Furthermore, it has recently received licenses to gas fields in the Yamal and Gydan peninsulas that apparently contain the relevant LNG provisions and thus can serve to expand the production and export base for both the Yamal LNG and Arctic LNG 2 projects.
4. **Any company in which the state shareholding is at least 50 per cent, for gas produced from any offshore field for which it is the licensee (or from a PSA field).** Currently, this means only Rosneft and Gazprom since, per the Subsoil Law and practice to date, they are the only two state companies that are licensees of such fields. Of course, Rosneft's proposed new LNG plant on Sakhalin could be the prime beneficiary - because Gazprom already had and will retain the blanket right to export gas according to the original clauses of the Law on Gas Export.

Although the 2013 amendment to the Law on Gas Exports was a partial liberalisation, insofar as it removed Gazprom's monopoly on LNG exports aside from the exemptions granted to grandfathered PSAs, it was accurately described as a "limited liberalisation".<sup>40</sup> As our OIES colleague, Tatiana Mitrova, noted at the time: "the law merely legalised exemption from Gazprom's export monopoly for two companies", namely Novatek and Rosneft.<sup>41</sup> Given that the term 'liberalisation' could be misleading in this case, it is perhaps better to describe the new policy as 'managed competition for access to export', since the scope of the law was limited to allowing LNG exports from carefully selected projects.

Despite the limited scope of the change, it was an important step forward in loosening Russia's gas export monopoly and introducing new gas export channels other than Gazprom. In particular, it allowed Novatek and Rosneft the opportunity to secure financing on preferential terms using their export contracts as a guarantee of loan repayments and to reach FIDs much sooner than would otherwise be the case. It could even be argued that this regulatory change provided Novatek with the opportunity to emerge as Russia's LNG champion.

## 4. Key players in Russian LNG: Gazprom, Novatek, and Rosneft

### 4.1. Gazprom

Despite the growing LNG ambitions of the Russian government, its national champion, Gazprom, has not delivered any new large-scale LNG projects since it joined Russia's first LNG export project – Sakhalin-2 – in 2009. A planned export project based on offshore deposits in the Barents Sea – Shtokman LNG – was 'postponed indefinitely' in 2012 and the project company was wound up in 2019.<sup>42</sup> That project was undone by the disappearance of the main target market, the United States, which became first self-sufficient and later a net exporter on the basis of its 'shale gas revolution'. It is possible that Gazprom's decision to 'indefinitely postpone' the Shtokman project influenced the decision by the Russian government a year later to allow LNG exports by Novatek and Rosneft.

At its Investor Day in 2014, Gazprom discussed two more LNG export projects: Vladivostok LNG (for exports to Asia) and Baltic LNG (for exports to Europe). Both were planned at 10 mtpa, with Gazprom

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<sup>40</sup> Hille, K., 2013. Russia paves way for limited liberalisation of LNG exports. *Financial Times*, 22 November. <https://www.ft.com/content/810adb6e-539c-11e3-b425-00144feabdc0>

<sup>41</sup> Mitrova, T., 2013. Russian LNG: *The Long Road to Export*. Institut Français des Relations Internationales (IFRI), December 2013. <https://www.ifri.org/sites/default/files/atoms/files/defifrimitrovalngengdecember2013.pdf> (see page 28)

<sup>42</sup> Staalesen, A., 2019. No more Shtokman Development. *Barents Observer*, 21 June. <https://thebarentsobserver.com/en/industry-and-energy/2019/06/no-more-shtokman-development>



hoping to launch Vladivostok LNG by 2018 and Baltic LNG by 2019.<sup>43</sup> These two projects were tied to the development of export pipelines: Vladivostok LNG was to be connected to the Power of Siberia pipeline (thus gaining access to gas production in Eastern Siberia as feedstock), while Baltic LNG was to be located adjacent to the point at which Nord Stream 2 enters the Baltic Sea on Russia's coast (Ust-Luga). At the 2016 Investor Day, Vladivostok LNG was not mentioned and the start date for Baltic LNG had been pushed back to 2021.<sup>44</sup> At the 2020 Investor Day, the commissioning date for Baltic LNG had been pushed back further, to 2023-24, and the export capacity had been raised to 13 mtpa. Vladivostok LNG was not listed, and the expansion of Sakhalin-2 (with the addition of a third train of 5.4 mtpa) was referred to as 'prospective' for realisation in the mid-2020s.<sup>45</sup> Finally, at the most recent Investor Day, in April 2021, the launch dates for Baltic LNG were not mentioned (although the proposed capacity remained at 13 mtpa), the Vladivostok LNG project was again not listed, and the Sakhalin-2 expansion was also not listed.<sup>46</sup>

On the 21 May, Gazprom began construction work at the planned Ust-Luga gas processing and export complex, of which Baltic LNG will be part.<sup>47</sup> According to its website, Gazprom intends to launch the first train in the fourth quarter of 2023 and the second train in the fourth quarter of 2024.<sup>48</sup> Gazprom implicitly reiterated the difference in progress between the Baltic and Vladivostok projects in a presentation on investment in gas processing on 27 May, when it referred to Baltic LNG as 'under implementation' and Vladivostok LNG as 'prospective'.<sup>49</sup>

Gazprom's own LNG plans now focus more narrowly on small-scale and value-added projects. In the near future, Gazprom plans to launch a small-scale LNG export terminal – Portovaya LNG – in the Baltic Sea by the end of 2021.<sup>50</sup> In the context of growing demand for LNG as a shipping fuel, a Gazprom press release from December 2020 stated that Portovaya LNG "is geared to this market sector among others", while also noting "The Company is also exploring the options for implementing a mid-scale LNG project near Vladivostok in the Primorye Territory".<sup>51</sup> This mid-scale project could be a scaled-down revival of Vladivostok LNG, although the fact that it was not mentioned at the 2021 Investor Day suggests that its development should be regarded as possible, rather than probable.

Although Gazprom's Baltic LNG export project is far from small-scale in terms of its planned capacity (13 mtpa), the project has broader value to Gazprom as an integrated gas processing project. According to Gazprom, "Every year, it [the Ust-Luga gas processing project] will process 45 billion cubic meters of gas and produce 13 million tons of LNG, up to 3.8 million tons of ethane fraction, up to 2.4 million tons of LPG, and 0.2 million tons of pentane-hexane fraction. The gas remaining after the processing (about 19 billion cubic meters) will go into Gazprom's gas transmission system".<sup>52</sup> Indeed, it was this

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<sup>43</sup> Gazprom, 2014. *Investor Day Presentation*. [https://www.gazprom.com/f/posts/02/019623/gazprom\\_investor\\_day\\_presentation\\_2014\\_-\\_ny.pdf](https://www.gazprom.com/f/posts/02/019623/gazprom_investor_day_presentation_2014_-_ny.pdf) (see slide 9)

<sup>44</sup> Gazprom, 2016. *Investor Day Presentation*. <https://www.gazprom.com/f/posts/22/466948/gazprom-investor-day-presentation-2016.pdf> (see slide 9)

<sup>45</sup> Gazprom, 2020. *Investor Day Presentation*. <https://www.gazprom.com/f/posts/64/716836/investor-day-2020-presentation.pdf> (see slide 30)

<sup>46</sup> Gazprom, 2021. *Investor Day Presentation*. <https://www.gazprom.com/f/posts/23/378358/invest-day-2021-presentation.pdf> (see slide 38)

<sup>47</sup> Gazprom, 2021. Construction begins on Complex for processing ethane-containing gas near Ust-Luga. *Press Release*, 21 May. <https://www.gazprom.com/press/news/2021/may/article529200/>

<sup>48</sup> Gazprom, 2021. *Complex for processing ethane-containing gas and LNG production in Leningrad Region*. <https://www.gazprom.com/projects/lng-leningrad/>

<sup>49</sup> Gazprom, 2021. Activities of production complex. Investment projects in gas processing sector. *Presentation*, 27 May. <https://www.gazprom.com/f/posts/23/500364/presentation-press-conf-2021-05-27-en.pdf> (see slide 7)

<sup>50</sup> Walker, L., 2021. Gazprom's Baltic LNG export hub delayed until Q4. *Montel News*, 25 February. <https://www.montelnews.com/en/news/1198757/gazproms-baltic-lng-export-hub-delayed-until-q4>

<sup>51</sup> Gazprom, 2020. Gazprom moving forward with its LNG projects. *Press Release*, 23 December. <https://www.gazprom.com/press/news/2020/december/article521405/>

<sup>52</sup> Gazprom, 2021. *Complex for processing ethane-containing gas and LNG production in Leningrad Region*. <https://www.gazprom.com/projects/lng-leningrad/>



shift from a dedicated LNG export project to an integrated gas-processing project that led Shell to withdraw from the project in 2019, leaving Gazprom in partnership with RusGasDobycha.<sup>53</sup>

However, the departure of Shell did not derail the project. At a Gazprom press conference on 20 May – 24 hours before the ceremony to mark the launch of construction work – the Director of Gazprom Export, Elena Burmistrova, stated that discussions with RusGasDobycha remained ongoing regarding the sales and marketing strategy for supplies from Baltic LNG, but suggested that supplies from the project would not compete with Gazprom’s pipeline supplies to Europe.<sup>54 55</sup> This was followed on 4 June by the signing of an EPC (Engineering, Procurement, and Construction) contract between RusKhimAlyans (a joint venture between Gazprom and RusGasDobycha) and a consortium of Linde and Renaissance Heavy Industries.<sup>56</sup> The fact that Linde (a German company) signed the contract to participate in the Ust-Luga project suggests that it does not fear US sanctions.

The start of construction implies that the project will be realised, while the volumes planned are substantial (13 mtpa of LNG is the equivalent of around 17.7 bcm of natural gas). The fact that the LNG export terminal is part of a larger project may produce a certain economy of scale in terms of construction costs, and aid the ongoing profitability of its operation. Furthermore, the project is ‘value-added’ as part of a broader effort to monetise Gazprom’s ethane-rich, wet gas reserves. The feedstock for the Ust-Luga project will initially come from the Achimov and Valanginian layers of Achimov Blocks 4A and 5A at the Urengoy gas field, in the Nadym-Pur-Taz region of North-Western Siberia. The project company, Achim Development, produced its first gas from the two blocks in January and April 2021 (respectively) and expects production to ramp up to 14 bcma by 2027.<sup>57 58</sup> Later, further volumes will be sourced from the Tambeykoye gas field on the Yamal Peninsula, where production is planned to begin in 2026.<sup>59 60</sup> The fact that the Baltic LNG project is tied to broader plans to monetise wet gas production may provide an extra commercial incentive to push forward with the project.

The proposed launch dates for the two trains of Baltic LNG (2023/24) are the same as for the first two trains of Novatek’s planned Arctic LNG 2 project (discussed below). It is therefore possible that Gazprom and Novatek could find themselves in competition for LNG sales to the European market, meaning that the competition between the two companies is not limited to pipeline vs LNG.

## 4.2. Novatek

Against this background of increasing political urgency and Gazprom’s apparent procrastination in the 2010s, two competing companies, Novatek and Rosneft, emerged with plans of their own to bolster Russia’s LNG credentials. Rosneft was keen to develop the gas reserves at its Sakhalin-1 fields and proposed its Far East LNG concept, while Novatek was keen to push forward with Yamal LNG. However, both argued that they needed access to export markets, in particular to satisfy the banks and foreign partners who would be supporting the projects, and ultimately President Putin appears to have

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<sup>53</sup> Tass, 2019. Shell explains why it withdrew from Baltic LNG project with Gazprom. *Tass*, 24 June. <https://tass.com/economy/1065298>

<sup>54</sup> Gazprom, 2021. Gazprom in Foreign Markets. *Video Presentation*, 20 May. <https://www.gazpromvideo.ru/en/press/2021/foreign/> (see 14 minutes 20 seconds and 44 minutes 25 seconds)

<sup>55</sup> Platts, 2021. Russia’s Gazprom begins construction of major Ust-Luga gas complex. *Platts*, 21 May. <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/052121-russias-gazprom-begins-construction-of-major-ust-luga-gas-complex>

<sup>56</sup> Gazprom, 2021. Gas processing-related documents signed. *Press Release*, 4 June. <https://www.gazprom.com/press/news/2021/june/article530201/>

<sup>57</sup> Achim Development is a joint venture in which the shareholders are Gazprom (74.99 per cent) and Wintershall (25.01 per cent)

<sup>58</sup> Achim Development, 2021. Achim Development begins production from Block 5A of the Achimov deposits of the Urengoy field as part of comprehensive testing. *Press Release*, 21 April. <https://www.achimdevelopment.com/en/press-centr/news/96/>

<sup>59</sup> Gazprom, 2021. *Complex for processing ethane-containing gas and LNG production in Leningrad Region*. <https://www.gazprom.com/projects/lng-leningrad/>

<sup>60</sup> Gazprom, 2021. Construction begins on Complex for processing ethane-containing gas near Ust-Luga. *Press Release*, 21 May. <https://www.gazprom.com/press/news/2021/may/article529200/>



agreed that an element of competition would improve the prospects for Russian LNG. It was this support at the highest political level that facilitated the partial liberalisation of Russia's LNG export regulations in December 2013.<sup>61</sup>

Having been given the go-ahead on export sales, Novatek then took FID on the Yamal LNG project on 18 December 2013.<sup>62</sup> In doing so, Novatek effectively issued a challenge to Gazprom's LNG ambitions by asserting that it should be allowed to develop the Yamal LNG project singlehandedly and that it could only raise the finance needed to achieve its goals if it had full control of the project. In the end, Gazprom did not gain any shareholding in the project, and its involvement was limited to signing a 3 mtpa offtake agreement with Novatek, six months after Novatek took FID on the project.<sup>63</sup>

Rather, Novatek brought in foreign and arranged finance, with a substantial part from Chinese banks due to the restrictions imposed upon it by US sanctions.<sup>64</sup> The final shareholder structure is: Novatek (50.1 per cent), Total (20 per cent), CNPC (20 per cent), and the Silk Road Fund (9.9 per cent).<sup>65</sup> The project has three trains of 5.5 mtpa, and was estimated to have an overall cost of \$27 billion, while Novatek promised to deliver first its LNG by the end of 2017. Novatek surprised the LNG world by meeting that target (the first export cargoes shipped in December 2017), and went on to bring the second and third trains online ahead of schedule, in July and November 2018, respectively.<sup>66 67</sup>

In September 2019, Novatek then took FID on a second project, Arctic LNG 2, which will comprise of three 6.6mtpa trains on the Gydan peninsula, using innovative gravity-based structures. Novatek expects the three trains to be launched in 2023, 2024, and 2025, with the launch date of the third train recently brought forward by 12 months. The shareholders are: Novatek (60%), Total (10%), CNPC (10%), CNOOC Limited (10%) and the Japan Arctic LNG, consortium of Mitsui & Co and JOGMEC (10%).<sup>68 69</sup>

Novatek has also proposed two further projects: The first, Arctic LNG 1, is planned to have three trains similar to those at Arctic LNG 2 (also on the Gydan Peninsula), to be launched in 2027-2030. The project received a boost in March 2021, when the project company won an auction for a 30-year exploration and production licence for part of the peninsula and its offshore shallow waters.<sup>70</sup> The second proposed Novatek project, Obsky LNG, was announced in 2019 and originally envisaged a single, 6.6 mtpa train, to be developed in parallel with Arctic LNG 2 and brought into operation in 2023.<sup>71</sup> However, the project was scaled down to 5 mtpa and the launch date pushed back to 2024-25. Then, in June 2021, Novatek announced that it had reconfigured the project to produce ammonia, hydrogen

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<sup>61</sup> Reuters, 2013. Russia's Putin approves LNG exports for Gazprom's rivals. *Reuters*, 2 December. <https://www.reuters.com/article/russia-lng-idUSL5N0JH0W420131202>

<sup>62</sup> Novatek, 2013. Final investment decision made on Yamal LNG project. *Press Release*, 18 December. [https://www.novatek.ru/en/press/releases/index.php?id\\_4=812](https://www.novatek.ru/en/press/releases/index.php?id_4=812)

<sup>63</sup> Gazprom, 2014. Gazprom Marketing & Trading Singapore and Yamal Trade sign agreement to supply up to 3 million tons of LNG. *Press Release*, 23 May. <https://www.gazprom.com/press/news/2014/may/article191744/>

<sup>64</sup> Argus, 2016. Russia's Yamal LNG gets \$12bn from Chinese banks. *Argus Media*, 29 April. <https://www.argusmedia.com/en/news/1231726-russias-yamal-lng-gets-12bn-from-chinese-banks>

<sup>65</sup> Yamal LNG, 2021. Yamal LNG Reaches Fifty Million Tons Milestone. *Press Release*, 26 March. <http://yamallng.ru/en/press/news/38811/>

<sup>66</sup> Yamal LNG, 2021. *About the Project*. <http://yamallng.ru/en/project/about/>

<sup>67</sup> Yamal LNG, 2021. Yamal LNG Reaches Fifty Million Tons Milestone. *Press Release*, 26 March. <http://yamallng.ru/en/press/news/38811/>

<sup>68</sup> Novatek, 2019. Final Investment Decision Made on Arctic LNG 2 project. *Press Release*, 5 September. [https://www.novatek.ru/en/press/releases/index.php?id\\_4=3405](https://www.novatek.ru/en/press/releases/index.php?id_4=3405)

<sup>69</sup> Platts, 2021. Global Gas Supply In 5-10 Years May Not Be Tight Given Shorter Construction Cycles: Executives. *Platts*, 25 June. <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/062521-global-gas-supply-in-5-10-years-may-not-be-tight-given-shorter-construction-cycles-executives>

<sup>70</sup> Novatek, 2021. NOVATEK Obtains the North-Gydanskiy License Area. *Press Release*, 24 March. [https://www.novatek.ru/en/press/releases/index.php?id\\_4=4338](https://www.novatek.ru/en/press/releases/index.php?id_4=4338)

<sup>71</sup> Staalesen, A., 2019. Novatek announces 3rd LNG project in Arctic. *Barents Observer*, 23 May. <https://thebarentsobserver.com/en/industry-and-energy/2019/05/novatek-announces-3rd-lng-project-arctic>



and methanol, rather than LNG.<sup>72</sup> Also in June 2021, Russian sources reported that a fourth train at Yamal LNG – using Novatek’s proprietary ‘Arctic Cascade’ gravity-based technology was finally on stream, having been delayed by technical issues.<sup>73</sup>

Taken together, Yamal LNG (17.45 mtpa), Arctic LNG 2 (19.8 mtpa), and Arctic LNG 1 (19.8 mtpa), could enable Novatek to produce 57 mtpa of LNG by 2030. Indeed, that figure could be even higher: According to Novatek, the first three trains at Yamal LNG produced 18.8 mtpa of LNG in 2020, which was 14 per cent (2.3 mtpa) more than the nameplate capacity. Similar above-nameplate performance at Arctic LNG 1 & 2 would lift Novatek’s total LNG production to 64 mtpa. If Obsky LNG had continued as an LNG export project, that would have resulted in Novatek aiming at 70 mtpa of LNG exports by 2030, at the upper end of its 57-70 mtpa target reported in September 2020.<sup>74</sup>

Even without Obsky LNG, Novatek has become – and is set to remain – Russia’s *de facto* LNG champion. Support from the Russian government, in fiscal, financial, infrastructure, and strategic forms, has certainly been critical to its success to date, but there seems to be little doubt that the company has also demonstrated its ability to deliver complex projects on time and on budget and as such is likely to be given further encouragement for the foreseeable future. Furthermore, it has also supported industrial development of the Russian Far North and has helped to open up the strategically important Northern Sea Route, both of which are Kremlin priorities, reflected in the ‘Strategy for the Development of the Arctic Zone of Russia’, which was adopted in October 2020.<sup>75</sup>

### 4.3. Rosneft

By contrast, although Russia’s state-owned ‘oil champion’, Rosneft, has scaled up its gas production in Russia over the past decade – from 12.3 bcm in 2010<sup>76</sup> to 62.8 bcm in 2020<sup>77</sup> – its progress on the LNG front has been more modest. Rosneft’s planned Far East LNG export terminal is part of the Sakhalin-1 consortium, which Rosneft shares with ExxonMobil, Sodeco (Japan), and ONGC Videsh (India). The plant has a planned export capacity of 6.2 mtpa with the launch planned for 2027/28.<sup>78</sup> In April 2021, Rosneft announced plans to conduct the feasibility study, tender for an ECP (Engineering, Procurement and Construction) contractor, and start marketing the gas by the end of 2021.<sup>79</sup> The geographical location – in Russia’s Far East – suggests that supplies from this project will be marketed exclusive to Asia, where they could compete with Gazprom’s exports from Sakhalin-2, Novatek’s Asian deliveries, and even Gazprom’s pipeline supplies to China.

### 4.4. Gazprom and Novatek: two ‘champions’, each looking both east and west?

LNG has emerged as integral part of Russia’s gas export strategy, with a combination of commercial and political objectives. From a commercial perspective, LNG is now seen as vital to maintaining Russia’s competitive position in the global gas market while also providing opportunities for industrial and economic development domestically. From a political standpoint, LNG also provides a new avenue

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<sup>72</sup> Reuters, 2021. Novatek says it reconfigures Obsky LNG project to produce hydrogen, ammonia. *Reuters*, 23 June. <https://www.reuters.com/business/energy/novatek-says-it-reconfigures-obsky-lng-project-produce-hydrogen-ammonia-2021-06-23/>

<sup>73</sup> Afansiev, V., 2021. Yamal LNG brings troubled fourth train online at huge Russian project. *Upstream Online*, 1 June. <https://www.upstreamonline.com/lng/yamal-lng-brings-troubled-fourth-train-online-at-huge-russian-project/2-1-1018793>

<sup>74</sup> Reuters, 2020. Russia’s Novatek says on track for up to 70 million T/year of LNG by 2030. *Reuters*, 29 September. <https://www.reuters.com/article/us-novatek-lng-idUSKBN26K125>

<sup>75</sup> Ministry of the Russian Federation for the Development of the Far East and Arctic, 2020. Принята Стратегия развития Арктической зоны России до 2035 года (The strategy for the development of the Arctic Zone of the Russian Federation to 2035 was adopted). *Press Release*, 26 October. <https://minvr.gov.ru/press-center/news/28522/>

<sup>76</sup> Rosneft, 2011. Rosneft posts strong financial and operating performance in 2010. *Press Release*, 4 February. <https://www.rosneft.com/press/news/item/84251/>

<sup>77</sup> Rosneft, 2021. Operating Results For 4Q and 12M 2020. *Press Release*, 12 February. <https://www.rosneft.com/press/releases/item/205095/>

<sup>78</sup> Natural Gas World, 2021. Russia Approves Plan for Major LNG Push. *Natural Gas World*, 23 March. <https://www.naturalgasworld.com/russia-unveils-plan-for-major-lng-push-86623>

<sup>79</sup> Reuters, 2021. Rosneft aims to complete LNG plant feasibility study in 2021. *Nasdaq*, 30 April. <https://www.nasdaq.com/articles/rosneft-aims-to-complete-lng-plant-feasibility-study-in-2021-2021-04-30>





for developing international relations with new and existing customers for Russian hydrocarbons, while also allowing Russia to compete with key rivals in a rapidly globalizing market.<sup>80</sup>

As a result, it would now appear that Russia's overall gas export strategy is developing a two-pronged approach, based on pipeline and LNG exports, and as such promotes Gazprom and Novatek as their respective national champions. In terms of export destinations, Gazprom and Novatek must learn to live with one another as they both enter markets previously either dominated or coveted by the other. Although Gazprom remains dominant in pipeline exports to Europe, it is currently ramping up its exports to China (via the Power of Siberia), and planning its next large-scale project, to further expand its pipeline exports to Asia – a region seen as a key growth market for LNG. At the same time, although the Yamal LNG project was initially forecast to deliver the majority of its cargoes to Asia – either via the Northern Sea Route in summer or via transshipment in North-Western Europe and onward delivery via the Suez Canal in winter – the experience of the past two years has been that Yamal LNG cargoes have frequently found a home in Europe.

Therefore, from a strategic Russian perspective, this raises the question: is the risk of Russian gas supplies competing with one another (and reducing the potential profitability of those supplies) a genuine threat, or merely a 'phantom menace'?

## 5. Is LNG from Yamal competing with Gazprom's pipeline supplies to Europe?

### 5.1 The European gas balance in 2017-2020

The period of analysis begins in 2017, when Yamal LNG exports consisted of just a few cargoes in December.<sup>81</sup> In 2018, Yamal LNG operated at approximately 50 per cent capacity, with exports of 8.9 mt, before exporting at full capacity in 2019 and 2020, with exports of 18.8 and 19.2 mt, respectively.<sup>82</sup> Therefore, we may consider 2017 to be a year in which Yamal LNG had virtually no influence on the European market, before that influence ramped up throughout 2018, and reached its full impact in 2019 and 2020.

The market context into which the Yamal LNG project arrived was one in which European gas demand was relatively stable, falling by 2.5 per cent year-on-year in 2018 (despite a cold European winter in Q1), before growing by 3.3 per cent year-on-year in 2019. As will be demonstrated later, this growth in 2019 was significantly influenced by Europe absorbing LNG cargoes from a supply-long global market. Finally, mild weather in Q1-2020 was followed by the impact of the first COVID-related lockdowns in April and May, and a summer of extremely low European spot gas prices and LNG cargoes being shut in at terminals along the Gulf Coast of the United States. Therefore, Yamal LNG cargoes 'hit the market' just as that global LNG market was entering a supply-long period and Europe was absorbing the excess.

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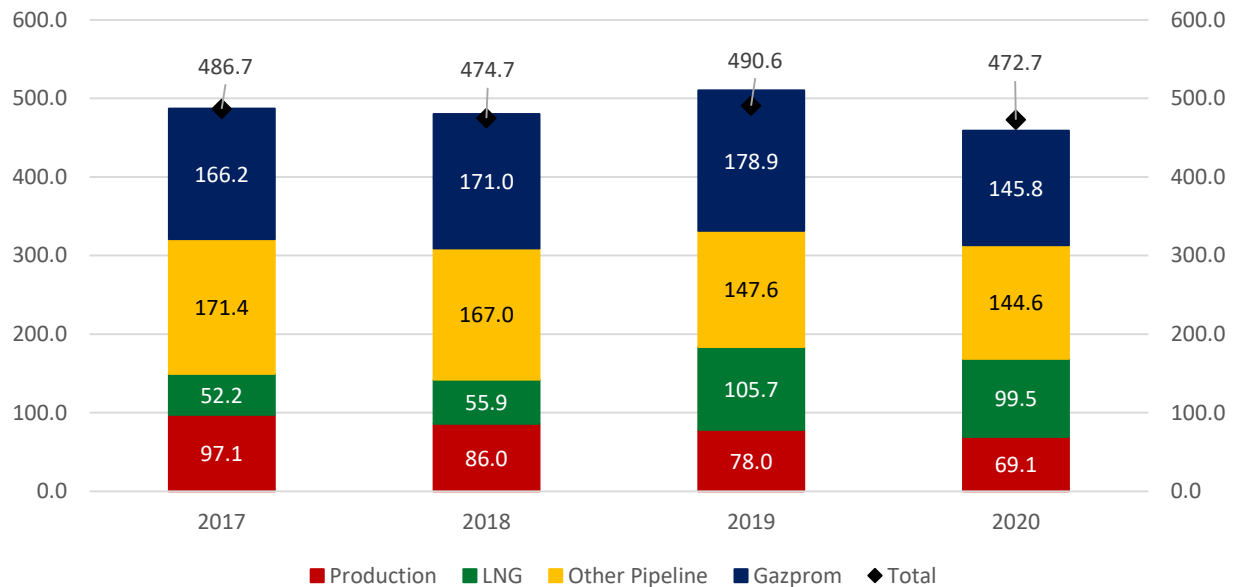
<sup>80</sup> See Henderson J. and Yermakov V. *Russian LNG: Becoming a Global Force* OIES Paper, Oxford, 2019. <https://www.oxfordenergy.org/publications/russian-lng-becoming-a-global-force/>

<sup>81</sup> Three cargoes were exported from Yamal LNG in December 2017, with a total of 0.22 mt (data from Kpler).

<sup>82</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



**Figure 1: Supplies to the European Market by Source, bcm**



OIES research based on data from ENTSOG Transparency Platform; Eurostat; Kpler; Gas Infrastructure Europe Aggregated Storage Inventory (GIE AGSI+).<sup>83 84 85 86</sup> Note that 'Europe' here refers to the EU-27 plus the UK, Switzerland, and non-EU Balkans, but excludes Turkey.<sup>87</sup>

Of particular note is the surge in LNG imports into North-Western Europe between 2018 and 2019. As total EU+UK LNG imports virtually doubled between 2017-18 and 2019-20, total LNG imports into the seven terminals of North-Western Europe rose from 10.8 mt (14.7 bcm) in 2017 and 16.4 mt (22.3 bcm) in 2018 to 36.7 mt (49.9 bcm) in 2019 and 35.3 mt (48.1 bcm) in 2020. This represents an increase of around 5.6 mtpa between 2017 and 2018, and a further increase of 20.3 mtpa between 2018 and 2019. The impact on the volumes received by the terminals of North-Western Europe is illustrated below.

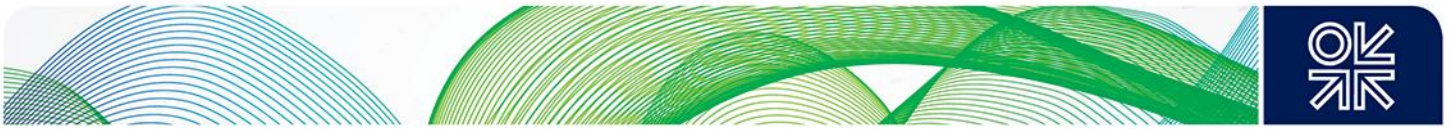
<sup>83</sup> ENTSOG, 2021. *Transparency Platform*. <https://transparency.entsog.eu/>

<sup>84</sup> Eurostat, 2021. *Supply, transformation and consumption of gas - monthly data [NRG\_CB\_GASM]*. [https://ec.europa.eu/eurostat/databrowser/view/nrg\\_cb\\_gasm/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/nrg_cb_gasm/default/table?lang=en)

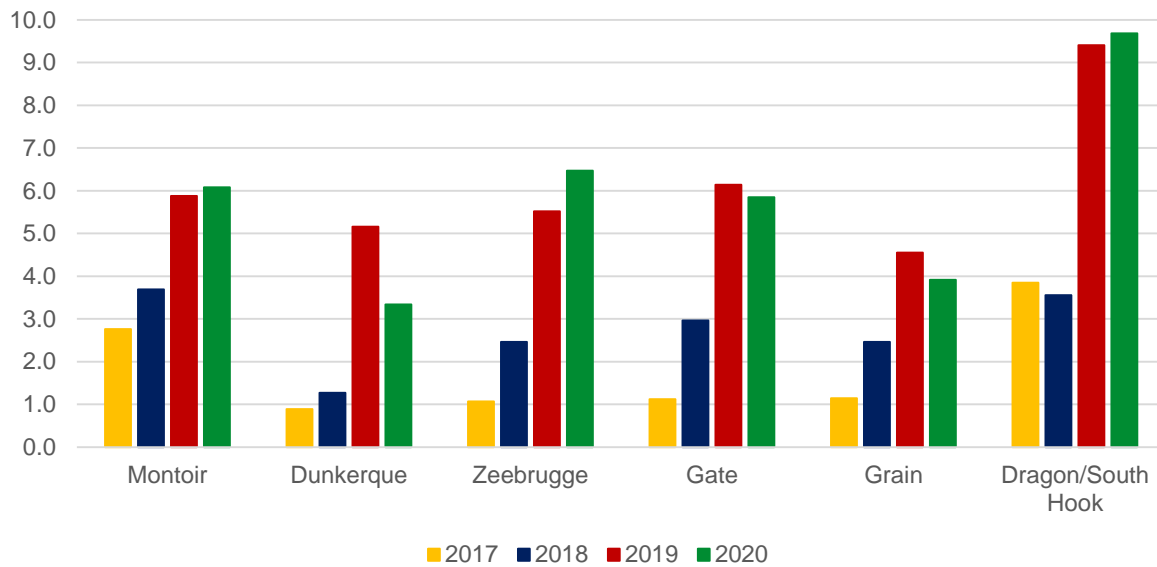
<sup>85</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>86</sup> Gas Infrastructure Europe (GIE), 2021. *Aggregated Gas Storage Inventory (AGSI+) - Europe*. <https://agsi.gie.eu/#/historical/eu>

<sup>87</sup> Here it should be emphasised that the figures in the graph above are for physical supply as measured at LNG import terminals, cross-border pipeline interconnections, and in accordance with national data on gas production and storage injections/withdrawals. In 2017 and 2018, the 'total' virtually matches the combined figures for production and pipeline/LNG imports, because in the calendar year there was only limited change in storage stocks. By contrast, in 2019, European storage absorbed around 19.6 bcm, which meant that the total volume of gas consumed was less than the sum of production and imports. By contrast, in 2020, Europe experienced a net withdrawal from storage during the calendar year of around 13.7 bcm, meaning that the total volume of gas consumed was greater than the sum of production and imports. The fact that these figures refer to physical production/imports/consumption rather than 'sales' by company (which can include gas that is either injected into or withdrawn from storage, or re-sold at a later date before it is consumed) explains why these figures differ slightly from Gazprom's own figures for sales to Europe.



**Figure 2: Total LNG Imports into North-Western Europe by Terminal (mtpa)**



OIES research based on data from Kpler platform.<sup>88</sup>

These figures can now be compared to the ramp-up of exports from Yamal LNG to North-Western Europe, to estimate the share of Yamal LNG in this increase in LNG imports, which may have competed with Gazprom's pipeline supplies to North-Western Europe.

## 5.2. Cargoes from Yamal LNG: where did they go?

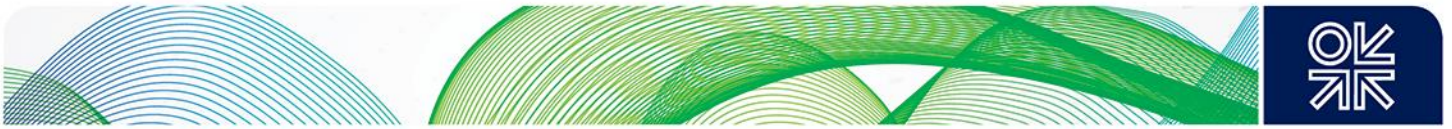
Data from the Kpler LNG Platform states that exports from the Yamal LNG terminal reached 8.4 million tonnes (11.4 bcm of natural gas equivalent) in 2018, before rising to 18.8 mt (25.6 bcm) in its first full year of operation, before rising again to 19.2 mt (26.2 bcm) in 2020.<sup>89</sup>

At first glance, the data presented in Fig.3 and Fig.4 suggest that the vast majority of exports from Yamal LNG found their way to Europe generally, and to North-Western Europe in particular. The share of the UK, France, Belgium, and the Netherlands combined in total Yamal LNG shipments to Europe was 62 per cent in 2018, 82 per cent in 2019, and 79 per cent in 2020.<sup>90</sup>

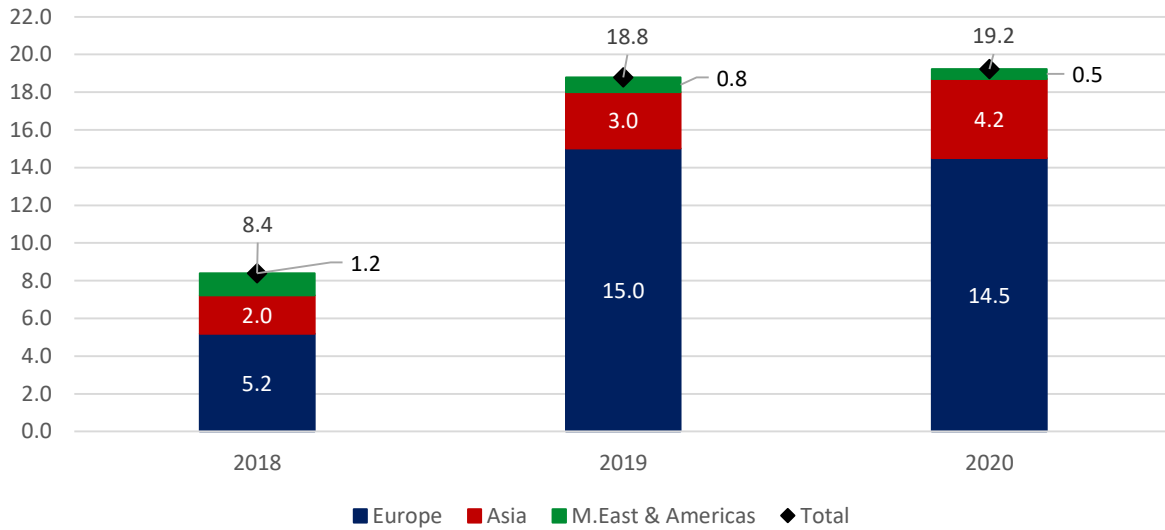
<sup>88</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>89</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>90</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

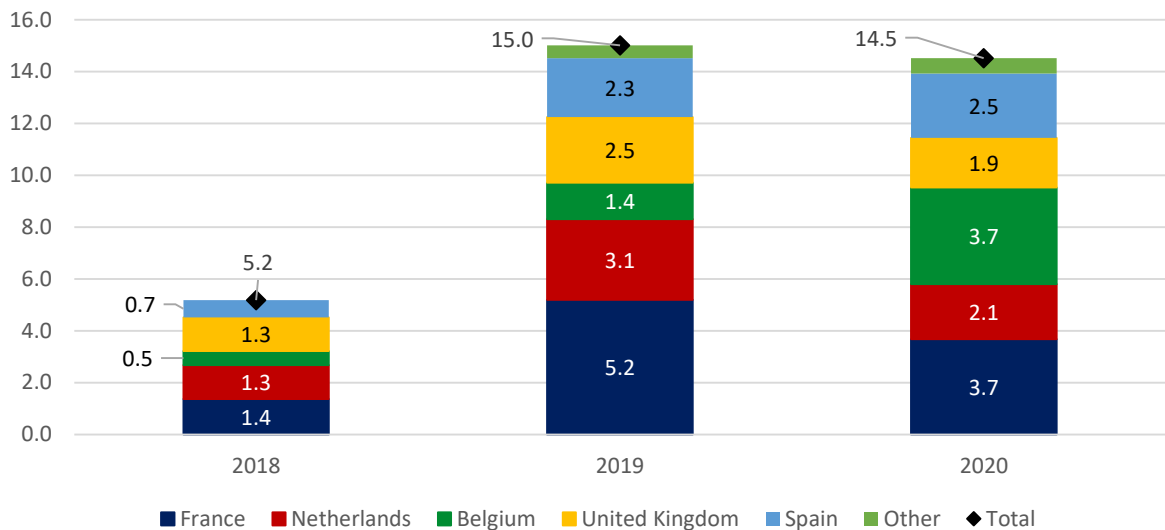


**Figure 3: Destinations of Cargoes from Yamal LNG (mtpa)**



OIES research based on data from Kpler.<sup>91</sup>

**Figure 4: Destinations of Cargoes from Yamal LNG (mtpa)**



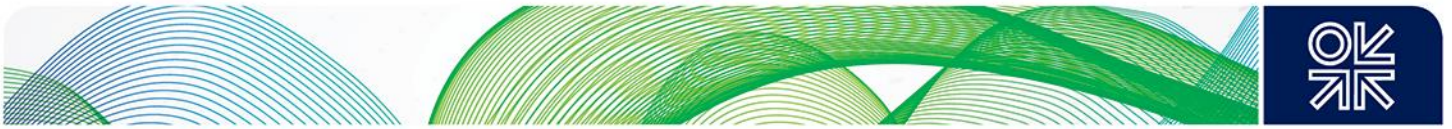
OIES research based on data from Kpler.<sup>92</sup> Note that 'Other' includes deliveries to Portugal (0.5 mt in 2020) and deliveries of up to 0.1 mtpa to Norway, Lithuania, Italy, Greece, Croatia, and Turkey in 2018-20).

### 5.3. Did Yamal LNG flood the terminals of North-Western Europe in 2019-2020?

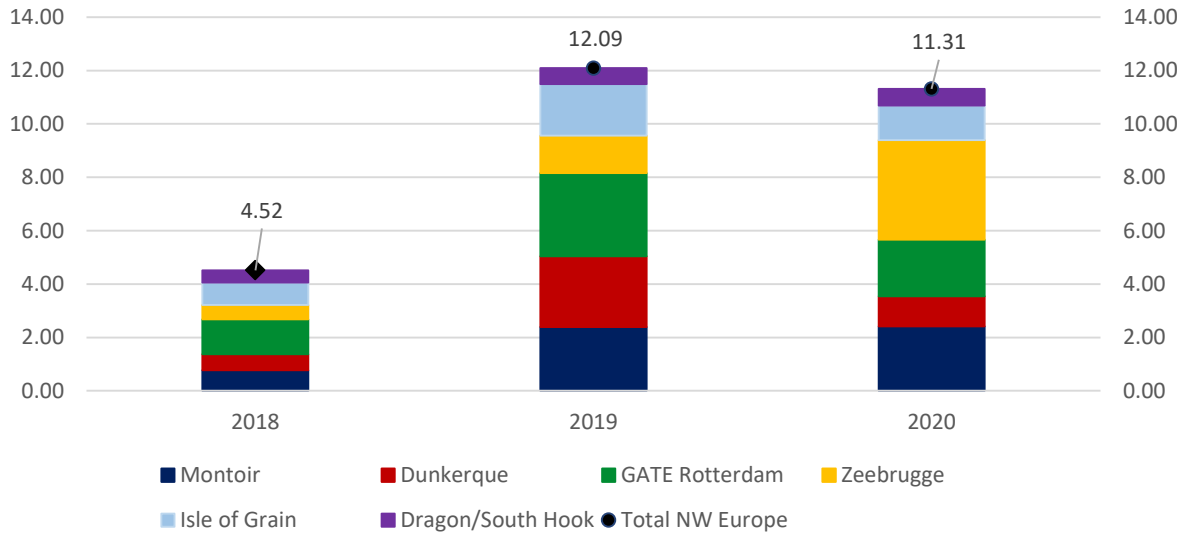
Having ascertained that the majority of cargoes from Yamal LNG were shipped to four countries in North-Western Europe (UK, France, Belgium, and the Netherlands) in 2018-20, it is worthwhile to examine the 'flip side' of that same coin: the volumes received by individual terminals in the region, and the share of Yamal LNG in total imports in each of the terminals of North-Western Europe.

<sup>91</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>92</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

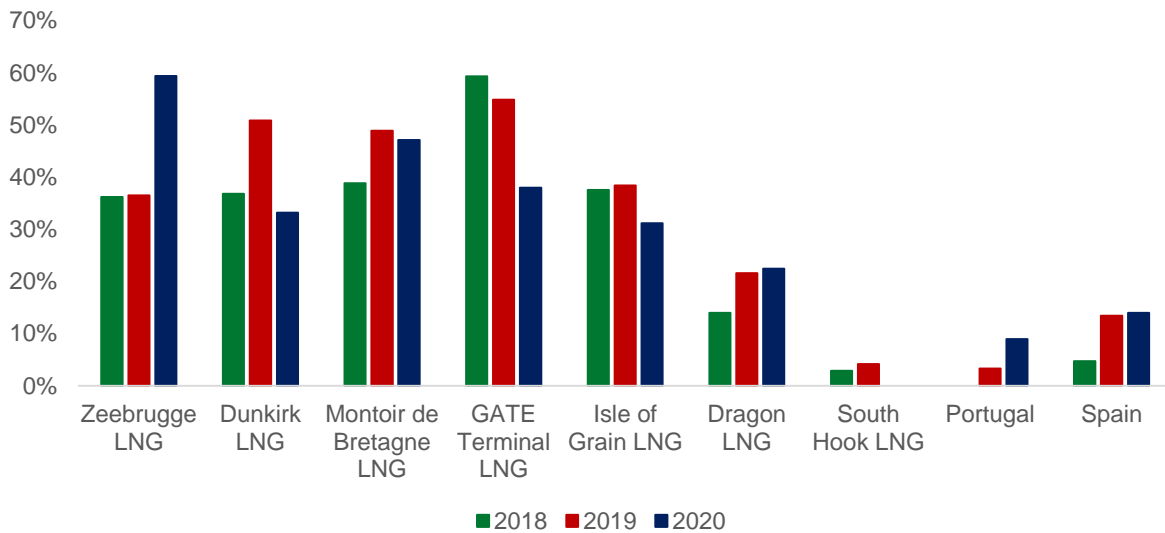


**Figure 5: Yamal LNG Deliveries by Destination Terminal in Northwest Europe (mtpa)**



OIES research based on data from Kpler.<sup>93</sup>

**Figure 6: Share of Yamal LNG in European terminals' LNG Imports**



OIES research based on data from Kpler.<sup>94</sup>

These figures suggest that supplies from Yamal LNG to the seven terminals in North-Western Europe accounted for 4.5 mt of the 5.6 mt increase in imports between 2017 and 2018, and 12.1 mt of the 20.3 mt increase in imports between 2018 and 2019. Furthermore, as the graphs above demonstrate, Yamal LNG rapidly came to account for 35-50 per cent of LNG imports by terminal in North-Western Europe, with that figure reaching as high as 59 per cent for GATE Rotterdam in 2018 and Zeebrugge in 2020. This is notable because, if Gazprom's pipeline supplies were indeed competing with LNG in those markets in 2018-2020, then a substantial proportion of that competitive LNG was supplied from Yamal.

<sup>93</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>94</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



With Zeebrugge having ramped up its imports from Yamal in 2020, a recent development could help to ensure sustained imports in the future: In February 2021, Fluxys LNG, the owner and operator of Zeebrugge, reached FID to build 6 mtpa of additional regasification capacity at the terminal. Initial capacity of 4.7 mtpa will be completed by early 2024 and the remainder by 2026. As a result, the 4.5 mtpa delivered by Yamal LNG to Zeebrugge in 2020 is likely to represent the lower band of the range of the future shipments, especially when new capacity at Arctic LNG-2 is launched.

However, these four countries in North-Western Europe are not necessarily the final destinations of cargoes from Yamal LNG. Cargoes may be discharged into storage tanks at these terminals, only to be re-loaded onto other LNG carriers for onward delivery to other destinations. We can be certain that at least a portion of these reloads are cargoes from Yamal LNG, given that Yamal Trade (a subsidiary of the Yamal LNG project company) holds a 20-year contract for a dedicated transshipment tank at Zeebrugge that has storage capacity for 180,000 cubic metres of LNG and can handle 8 mtpa of transshipment. That storage tank was brought into operation in January 2020.<sup>95</sup>

Part of the reason for these transshipments is seasonal: LNG cargoes are exported from Yamal LNG on ice-class LNG carriers. In winter, when these vessels cannot traverse the North Sea Route to reach Asia, they can bring cargoes to North-Western Europe for either ship-to-ship transfer or discharge into the storage tanks of LNG terminals, before the cargo is reloaded onto conventional LNG carriers and delivered onwards (including to Asia via the Suez Canal).<sup>96</sup> Transshipment is also a question of operational efficiency, to avoid using ice-class LNG carriers for deliveries around the ice-free waters of Europe.

Therefore, to estimate how much of the volume of LNG supplied from Yamal LNG actually remains in North-Western Europe, it is necessary to analyse the imports by source and re-exports by destination at the LNG terminals that receive cargoes from Yamal LNG: Montoir-de-Bretagne (France), Dunkerque (France), Zeebrugge (Belgium), GATE (Netherlands), Isle of Grain, and Dragon/South Hook (UK).

#### 5.4. The influence of re-exports on the final destination of Yamal LNG cargoes

The two tables below show the imports and re-exports at seven LNG import terminals in North-Western Europe in 2019 and 2020, as measured in million tonnes per annum (mtpa) of LNG. The imports refer to volumes that were discharged from LNG carriers into the terminal storage tanks (regardless of whether or not the volumes were regasified and injected into the pipeline network), while the re-exports refer to volumes taken from the terminals' LNG storage tanks and reloaded onto LNG carriers. The calculation of net imports (imports minus re-exports) and net imports as a share of total (gross) imports provides a clear sense of the share of imports that were actually retained by the regional market in North-Western Europe.

In 2018, gross imports into the seven terminals in the UK, France, Belgium, and the Netherlands in North-Western Europe totalled 16.4 mtpa, of which 4.5 mt (27 per cent) was sourced from Yamal. Re-exports of 1.92 mt left net imports of 14.5 mt, and of those re-exports, just 0.08 mt was re-exported to other terminals in North-Western Europe, and a further 0.24 mt was re-exported to other European destinations. If volumes from Yamal were re-exported in proportion to the share of Yamal cargoes in total imports, then around 27 per cent of imports from Yamal were re-exported, this suggests that approximately 0.52 mt of imports from Yamal were re-exported, leaving net imports of 3.98 mt from Yamal (equivalent to 5.4 bcm of natural gas).

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<sup>95</sup> LNG World News, 2020. *Yamal LNG trans-shipment tank at Zeebrugge in full operation*. *Offshore Energy*, 8 January. <https://www.offshore-energy.biz/yamal-lng-transshipment-tank-at-zeebrugge-in-full-operation/>

<sup>96</sup> Dunkerque LNG, 2018. *Dunkerque LNG receives its first ice-breaking LNG tanker from Yamal LNG*. *Press Release*, 26 January. [https://www.edf.fr/sites/default/files/Lot%203/DUNKERQUE%20LNG/Actualit%C3%A9s/2018/20180125borisvf\\_en.pdf](https://www.edf.fr/sites/default/files/Lot%203/DUNKERQUE%20LNG/Actualit%C3%A9s/2018/20180125borisvf_en.pdf)

**Figure 7: LNG in North-Western Europe in 2018 (mtpa)**

	Imports	(Of Which from Yamal)	Re-Exports	Net Imports	Net Imports as Share of Total Imports
Montoir	3.69	0.77	0.77	2.92	79.1%
Dunkerque	1.27	0.60	0.13	1.14	89.8%
Zeebrugge	2.47	0.54	0.34	2.13	86.2%
GATE	2.96	1.31	0.47	2.49	84.1%
Grain	2.46	0.83	0.20	2.26	91.9%
Dragon	1.53	0.39	0.00	1.53	100.0%
South Hook	2.03	0.08	0.00	2.03	100.0%
<b>Total</b>	<b>16.41</b>	<b>4.52</b>	<b>1.91</b>	<b>14.50</b>	<b>88.4%</b>

OIES research based on data from Kpler.<sup>97</sup>

In 2019, gross imports into the seven terminals in the UK, France, Belgium, and the Netherlands in North-Western Europe totalled 36.26 mt, of which 12.11 mt (33 per cent) was sourced from Yamal LNG. Re-exports were extremely limited (0.38 mt). Of those re-exports, 0.08 mt was re-exported to other terminals in the UK, France, Belgium, and the Netherlands, while a similar amount (0.09 mt) was re-exported to other European destinations, and 0.21 mt was re-exported to Asia. Therefore, net imports from Yamal LNG to the UK, France, Belgium, and Netherlands could have been anywhere between 11.81 mt (assuming only cargoes from Yamal LNG were re-exported) and 12.11 mt (assuming that only non-Yamal cargoes were re-exported). A reasonable estimate would be that cargoes were re-exported in proportion to the gross imports, which means that 33 per cent of the re-exports (0.13 mt) were originally from Yamal, which means that estimated net imports from Yamal could have been around 11.98 mt.

**Figure 8: LNG in North-Western Europe in 2019 (mtpa)**

	Imports	(Of Which from Yamal)	Re-Exports	Net Imports	Net Imports as Share of Total Imports
Montoir	5.73	2.36	0.06	5.67	99.0%
Dunkerque	5.25	2.70	0.08	5.17	98.5%
Zeebrugge	5.48	1.47	0.19	5.29	96.5%
GATE	6.13	3.08	0.05	6.08	99.2%
Grain	4.58	1.83	0.00	4.58	100.0%
Dragon	2.11	0.37	0.00	2.11	100.0%
South Hook	6.98	0.30	0.00	6.98	100.0%
<b>Total</b>	<b>36.26</b>	<b>12.11</b>	<b>0.38</b>	<b>35.88</b>	<b>99.0%</b>

OIES research based on data from Kpler.<sup>98</sup>

In 2020, gross imports into the seven terminals in the UK, France, Belgium, and the Netherlands in North-Western Europe remained virtually unchanged year-on-year, at 36.34 mt (+0.08 mt y-o-y). Gross imports from Yamal LNG fell by 0.75 mt, to 11.36 mt (31 per cent of the gross imports). However, the volume of re-exports from these seven terminals rose substantially, to 3.99 mt, of which 1.04 mt was re-exported to other terminals in the UK, France, Belgium, and the Netherlands, while 2.95 mt was re-exported beyond those four countries. Therefore, net imports to those four countries totalled 33.39 mt. Therefore, net imports from Yamal LNG to the UK, France, Belgium, and Netherlands could have been anywhere between 8.41 mt (assuming only cargoes from Yamal LNG were re-exported) and 11.36 mt (assuming that only non-Yamal cargoes were re-exported). Again, assuming that cargoes were re-

<sup>97</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>98</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



exported in proportion to the gross imports, which means that 31 per cent of the re-exports (1.24 mt) were originally from Yamal, which means that estimated net imports from Yamal could have been around 10.12 mt.

**Figure 9: LNG in North-Western Europe in 2020 (mtpa)**

	Imports	(Of Which from Yamal)	Re-Exports	Net Imports	Net Imports as Share of Total Imports
Montoir	6.26	2.47	0.45	5.81	92.8%
Dunkerque	3.37	1.19	0.24	3.13	92.9%
Zeebrugge	6.61	3.63	2.92	3.69	55.8%
GATE	6.00	2.25	0.38	5.62	93.7%
Grain	4.01	1.29	0.00	4.01	100.0%
Dragon	2.46	0.53	0.00	2.46	100.0%
Hook	7.63	0.00	0.00	7.63	100.0%
<b>Total</b>	<b>36.34</b>	<b>11.36</b>	<b>3.99</b>	<b>32.35</b>	<b>89.0%</b>

OIES research based on data from Kpler.<sup>99</sup>

An interesting year-on-year shift between 2019 and 2020 was the increase in re-exports to Asia (from 0.21 mt in 2019 to 2.06 mt in 2020), alongside an increase in re-exports to the UK, France, Belgium, and Netherlands combined (from 0.08 mt to 1.04 mt), an increase in re-exports to other European destinations (from 0.09 mt in 2019 to 0.78 mt in 2020), and a small volume of re-exports outside Europe and Asia (zero in 2019 and 0.1 mt in 2010). This increase in re-exports to Asia accompanied the increase in direct exports to Asia from Yamal LNG, from 3 mt in 2019 to 4.2 mt in 2020, which was illustrated in Fig. 2 earlier.

To conclude, it seems reasonable to estimate that net imports from Yamal LNG into seven terminals in four countries of North-Western Europe (UK, France, Belgium, and the Netherlands) were approximately 3.98 mt (5.4 bcm of natural gas equivalent) in 2018, 11.98 mt (16.3 bcm of natural gas equivalent) in 2019 and 10.12 mt (13.8 bcm) in 2020. Of these volumes, net deliveries from Yamal LNG to the UK amounted to 1.3 mt (1.8 bcm) in 2018, 2.5 mt (3.4 bcm) in 2019, and 1.82 mt (2.48 bcm) in 2020, leaving estimated net deliveries to France, Belgium, and the Netherlands combined at 2.68 mt (3.6 bcm) in 2018, 9.48 mt (12.9 bcm) in 2019 and 8.3 mt (11.3 bcm) in 2020.

This analysis is valuable because the precise extent of LNG re-exports in North-Western Europe is not well known. With regard to this particular case study, we have been able to deduce the approximate volumes of LNG from Yamal that not only arrived in North-Western Europe but, crucially, stayed there, and the share of those Yamal deliveries to North-Western Europe in total Yamal LNG exports. In 2019 in particular, the vast majority of Yamal LNG deliveries to North-Western Europe remained there, and the available data also suggests that while re-exports were greater in 2020, the volume of LNG that arrived from Yamal and remained in North-Western Europe was substantial enough to be materially competitive with Gazprom's pipeline supplies to those same markets.

### 5.5. Gazprom's exports to NW Europe in 2017- 2020

Having established that net imports to the UK, France, Belgium, and the Netherlands from Yamal LNG were approximately 5.4 bcm in 2018, 16.3 bcm in 2019 and 13.8 bcm in 2020, the question is: Did those volumes displace Gazprom's pipeline supplies? The comparison can be made on the basis of the table below, which shows Gazprom's annual supplies to Europe in 2017-2020.

<sup>99</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



**Figure 10: Gazprom exports to Europe under Gazprom Export contracts, 2017-2020 (bcm)**

	2017	2018	2019	2020
UK	16.3	14.3	10.3	6.0
France, Belgium, Netherlands	16.9	22.6	25.0	26.7
Other Europe	162.8	167.1	158.9	145.0
<b>Total Europe</b>	<b>195.9</b>	<b>203.9</b>	<b>194.2</b>	<b>177.7</b>
<i>(Of Which NW Europe)</i>	33.2	36.9	35.3	32.7

OIES research based on data from Reuters.<sup>100</sup>

Here, two interesting points emerge. Firstly, Gazprom's reported contractual sales via Gazprom Export (thus excluding trading via Gazprom Marketing & Trading [GM&T]) to the UK declined by 2 bcm in 2017-18, as imports from Yamal LNG rose from zero to approximately 1.8 bcm. Then, between 2018 and 2019, as Yamal volumes to the UK increased by a further 1.6 bcm, Gazprom's sales to the UK slipped by 4 bcm. This suggests that Gazprom's pipeline supplies may have been displaced by Yamal LNG in 2018, but also by LNG from other sources in 2019. Furthermore, Gazprom's pipeline supplies to the UK fell further still in 2020 (by 4 bcm year-on-year), despite the fact that UK net imports from Yamal LNG also fell by approximately 0.9 bcm year-on-year. Thus, in 2020, Gazprom's pipeline supplies were not being displaced by cargoes from Yamal LNG, but by a combination of LNG cargoes from other suppliers and an overall decline in demand.

Secondly, regarding combined supplies to France, Belgium, and the Netherlands, while net imports from Yamal LNG rose from zero in 2017 to 3.6 bcm in 2018, and 13 bcm in 2019, before falling to 11 bcm in 2020, Gazprom's own pipeline supplies to those three markets combined rose substantially year-on-year in 2017-18 (+5.7 bcm) and again in 2018-19 (+2.4 bcm), and finally rose by a further 1.7 bcm in 2020. So, deliveries from Yamal LNG were certainly not displacing pipeline supplies from Gazprom, although Gazprom could possibly argue that its own pipeline supplies might have been higher still had the cargoes from Yamal LNG not been available.

**Figure 11: Gazprom Group LNG Sales 2016-2020 (million tonnes per annum [mtpa])**

	2016	2017	2018	2019	2020
UK	0.00	0.00	0.00	0.42	0.64
France, Belgium, and Netherlands	0.00	0.00	0.00	0.00	1.54
Greece and Spain	0.00	0.13	0.06	0.21	0.56
Non-Europe	3.42	2.96	3.53	2.87	4.70
<b>Total</b>	<b>3.42</b>	<b>3.09</b>	<b>3.59</b>	<b>3.49</b>	<b>7.43</b>
<i>(Of Which NW Europe)</i>	0.00	0.00	0.00	0.42	2.17

Source: Gazprom in Figures, 2016-2020: page 87<sup>101</sup>

<sup>100</sup> Reuters, 2021. ТАБЛИЦА-Экспорт Газпрома по странам в 2020г (TABLE: Gazprom exports by country in 2020). Reuters, 15 February. <https://www.reuters.com/article/-2020-idRUL8N2KL3N1>

<sup>101</sup> Gazprom, 2021. Gazprom in Figures 2016-2020. <https://www.gazprom.com/f/posts/45/961659/gazprom-in-figures-2016-2020-en.pdf> (see page 87)



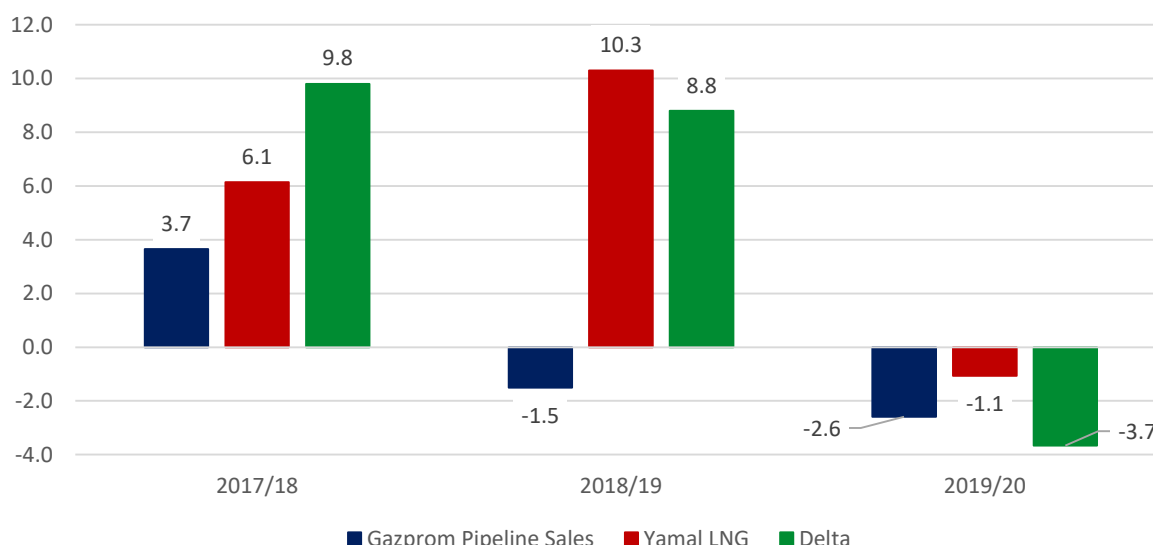
**Figure 12: Gazprom Group LNG Sales 2016-2020 (billion cubic metres of natural gas equivalent)**

	2016	2017	2018	2019	2020
UK	-	-	-	0.56	0.87
France, Belgium, and Netherlands	-	-	-	-	2.09
Greece and Spain	-	0.17	0.08	0.29	0.76
Non-Europe	4.66	4.03	4.80	3.90	6.40
<b>Total</b>	<b>4.66</b>	<b>4.20</b>	<b>4.88</b>	<b>4.75</b>	<b>10.11</b>
<i>(Of Which NW Europe)</i>	-	-	-	0.56	2.96

Source: Gazprom in Figures, 2016-2020: page 87<sup>102</sup>

The relationship between the year-on-year change in Gazprom’s pipeline supplies and supplies from Yamal LNG to the four markets of North-Western Europe is illustrated below. In 2017/18 and 2018/19 the net effect was certainly positive from the perspective of Russian gas as a whole. By contrast, in 2019/20, both Gazprom’s pipeline supplies and LNG supplies from Yamal to North-Western Europe declined year-on-year.

**Figure 13: Year-on-Year Change in Gazprom Pipeline and Yamal LNG Supplies to the UK, France, Belgium, and the Netherlands Combined (bcm)**



OIES research based on data from Kpler.<sup>103</sup>

A key point here is that, given the limited re-exports from North-Western Europe in 2018-2020, the majority of LNG cargoes that arrived in North-Western Europe stayed there. Which means that they displaced *something*, whether it was Gazprom’s pipeline supplies or LNG cargoes from other suppliers. When we remember that deliveries from Yamal to North-Western Europe rose from zero in 2017 to around 11-12 mtpa (equivalent to approximately 15-16 bcm of natural gas), it is clear that the volumes in question were substantial.

In terms of which suppliers were displaced by Yamal LNG in North-Western Europe, Gazprom could certainly argue that had Yamal LNG cargoes not been available, its sales to the region would have risen, rather than falling as they did by 1.5 bcm year-on-year in 2019 and by 2.6 bcm year-on-year in

<sup>102</sup> Gazprom, 2021. *Gazprom in Figures 2016-2020*. <https://www.gazprom.com/ft/posts/45/961659/gazprom-in-figures-2016-2020-en.pdf> (see page 87)

<sup>103</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



2020. However, in the supply-long summer of 2020, it is possible that even if cargoes from Yamal LNG had not been available, Gazprom's pipeline supplies could still have been displaced by LNG cargoes from other suppliers – For example, US LNG cargoes that would have been delivered to Europe rather than being shut-in in Q3-2020.

We will return to the issue of the cost competitiveness of different suppliers, but here it is sufficient to note that the marginal cost<sup>104</sup> of US LNG in Europe in Q3-2020 was around 3 USD/MMBtu (see Fig.23, below). By contrast, data from the Russian Central Bank states that Russian pipeline and LNG exports in Q3-2020 averaged 104 USD and 151 USD per 1,000 m<sup>3</sup> of natural gas equivalent, respectively. This suggests that the average price of Russian pipeline gas exports in this period (to all foreign markets, including both Europe and the former Soviet Union) averaged 2.91 USD/MMBtu and the average price of Russian LNG exports (to all markets, from both Yamal LNG and Sakhalin-2) averaged 4.91 USD/MMBtu.<sup>105</sup> This implies that Gazprom's pipeline supplies to Europe in Q3-2020 would have been closely price-competitive with extra LNG cargoes arriving from the United States, had they arrived.

Given that Europe is effectively the 'market of last resort' for global LNG, the fact that US LNG cargoes were shut in rather than delivered to Europe was due to the fact that off-takers were losing money on a cash basis on every cargo, because the prices they could realise for their cargoes in Europe were below the combined costs of feedgas, liquefaction, and shipping. The average TTF day-ahead price in Q3-2020 was 2.7 USD/MMBtu, which was lower than the estimated marginal cost of US LNG exports. In July 2020, TTF prices were even at a slight discount to the US Henry Hub (-0.1 USD/MMBtu), rising to a premium of just 0.3 USD/MMBtu in August. The TTF premium to the Henry Hub finally increased to 1.9 USD/MMBtu in September 2020, thus easing the situation.<sup>106</sup> Even if the transportation of US LNG to Europe had been regarded as a 'sunk cost' (due to shipping contracts), the slight discount in July and slight premium in August 2020 meant that off-takers would not have covered their liquefaction costs if they had sold those cargoes to Europe on a spot basis at that time.

The hypothetical question that follows is whether, if Yamal LNG had not been available, would the lower supply to Europe have lifted prices to a level sufficient to avoid US LNG shut-ins? If European prices in a Yamal-free scenario had still not been sufficient to prevent off-takers of US LNG losing money on a cash basis, then it does seem likely that Gazprom's sales to North-Western Europe would have been higher. On the other hand, if European prices had been just high enough to attract US LNG cargoes that would otherwise have been shut in, would Gazprom have competed for that market share?

Here it is worth noting that Gazprom can increase sales in two ways: Either Gazprom's long-term contract counterparties nominate higher volumes within the flexibility offered by the take-or-pay provisions in those contracts ('supply pull') or Gazprom places greater volumes on the market, by signing new sales contracts or offering spot volumes via its Electronic Sales Platform (ESP) or trading subsidiary, Gazprom Marketing & Trading (GM&T) ('supply push'). In the supply-long market of 2020, Gazprom's counterparties were unlikely to have been nominating upwards or signing new long-term contracts. At the same time, our analysis shows that Gazprom's sales for near-term delivery via the ESP declined dramatically in 2020.<sup>107</sup> Here it is important to note that, while Gazprom's long-term contract counterparties have flexibility embedded in their contract through 'take-or-pay' clauses that

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<sup>104</sup> The marginal cost of US LNG in Europe is traditionally calculated as the price at Henry Hub multiplied by 115% plus transportation costs

<sup>105</sup> Central Bank of the Russian Federation, 2021. *Статистика внешнего сектора: Экспорт Российской Федерации энергетических товаров - Экспорт Российской Федерации природного газа - Экспорт Российской Федерации сжиженного природного газа. (Statistics of the external sector: Export of energy commodities from the Russian Federation – Exports from the Russian Federation of natural gas – Exports from the Russian Federation of liquefied natural gas).* [http://www.cbr.ru/statistics/macro\\_itm/svs/](http://www.cbr.ru/statistics/macro_itm/svs/)

<sup>106</sup> European Commission. 2020. Quarterly Report on European Gas Markets, Vol.13, Issue 3 (3<sup>rd</sup> Quarter). [https://ec.europa.eu/energy/sites/ener/files/documents/quarterly\\_report\\_on\\_european\\_gas\\_markets\\_q3\\_2020.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/quarterly_report_on_european_gas_markets_q3_2020.pdf) (see pg. 30).

<sup>107</sup> Sharples, 2020. The Role of the ESP in Gazprom's European Sales Strategy. *Oxford Energy Insight № 81*. Oxford Institute for Energy Studies. <https://www.oxfordenergy.org/publications/the-role-of-the-esp-in-gazproms-european-sales-strategy/>



allow them to raise or lower their daily nominations within set limits, volumes sold on the ESP are almost entirely delivered on a flat hourly and daily profile for the duration of the contract.

This seems to imply that, had Yamal LNG cargoes been absent in 2020 and had Gazprom faced competition from US LNG cargoes that were barely profitable, Gazprom would have been faced with a choice: Offer greater volumes to the spot market in attempt to drive down European hub prices to levels that cause US LNG to be shut in, or hold back volumes from the spot market for fear of driving hub prices into a 'race to the bottom' that would significantly impact the profitability of its large long-term contract portfolio, which is mostly (but not entirely) linked to hub prices.

The fact that Gazprom did indeed hold back from making spot sales for near-term delivery via its ESP in 2020 suggests that Gazprom may have followed a similar path had it been competing with US, rather than Russian, LNG in North-Western Europe in 2020. This, in turn, raises the interesting possibility that cargoes from Yamal LNG not only competed with Gazprom's pipeline supplies, but also with LNG from other suppliers. This impact is evidenced in Fig.6, which shows that cargoes from Yamal LNG accounted for at least 30 per cent of imports at five LNG terminals in North-Western Europe (Dunkerque, Montoir, Zeebrugge, GATE Rotterdam, and Isle of Grain) in 2018-2020.

A final point of nuance is to recall that Gazprom's own LNG sales in Europe jumped from virtually zero in 2017 and 2018 to 0.7 mt in 2019 and 2.7 mt in 2020. The breakdown of those sales is given in the table below, When the focus is placed on Gazprom's LNG sales to the four countries of North-Western Europe (UK, France, Belgium, and the Netherlands), it is notable that those sales rose from zero in 2018 to 0.56 bcm of natural gas equivalent in 2019 and 2.96 bcm in 2020. So, while Gazprom's pipeline sales to those four markets fell from 36.9 bcm in 2018 to 32.7 bcm in 2020 (a drop of 4.2 bcm), Gazprom's LNG sales to those four markets rose by 2.96 bcm in the same period. Therefore, while Gazprom's pipeline sales to North-Western Europe may have been negatively impacted by the growth in regional LNG imports between 2017 and 2020, some of that loss was offset by Gazprom itself engaging in LNG sales to the region, and that a significant portion of Gazprom's LNG supply was provided by its offtake from Yamal LNG. To be precise, even in the context of a COVID-impacted market in 2020, Gazprom managed to combine a year-on-year increase in pipeline sales of 1.7 bcm with a 2.1 bcm increase in LNG sales to France, Belgium, and the Netherlands combined. It was only to the UK where the 4 bcm decline in pipeline sales was barely offset by a 0.3 bcm in LNG sales.

To conclude, the available data suggests that the 60-65 per cent of cargoes from Yamal LNG were shipped to four markets in North-Western Europe: the UK, France, Belgium, and the Netherlands. Once re-exports are taken into account, exports from Yamal LNG to those four markets combined amounted to approximately 5.4 bcm in 2018, 16.3 bcm in 2019, and 13.8 bcm in 2020, versus zero in 2017. During that same time period, Gazprom's pipeline supplies to those four markets combined rose from 33.2 bcm in 2017 to 36.9 bcm in 2018, before falling to 35.3 bcm in 2019, and 32.7 bcm in 2020. In addition, Gazprom offset these losses with the addition of its own LNG sales to that four-market region from 2019 onwards, bringing its total sales to the region from 33.2 bcm in 2017 to 36.9 bcm in 2018, 35.9 bcm in 2019, and 35.7 bcm in 2020.

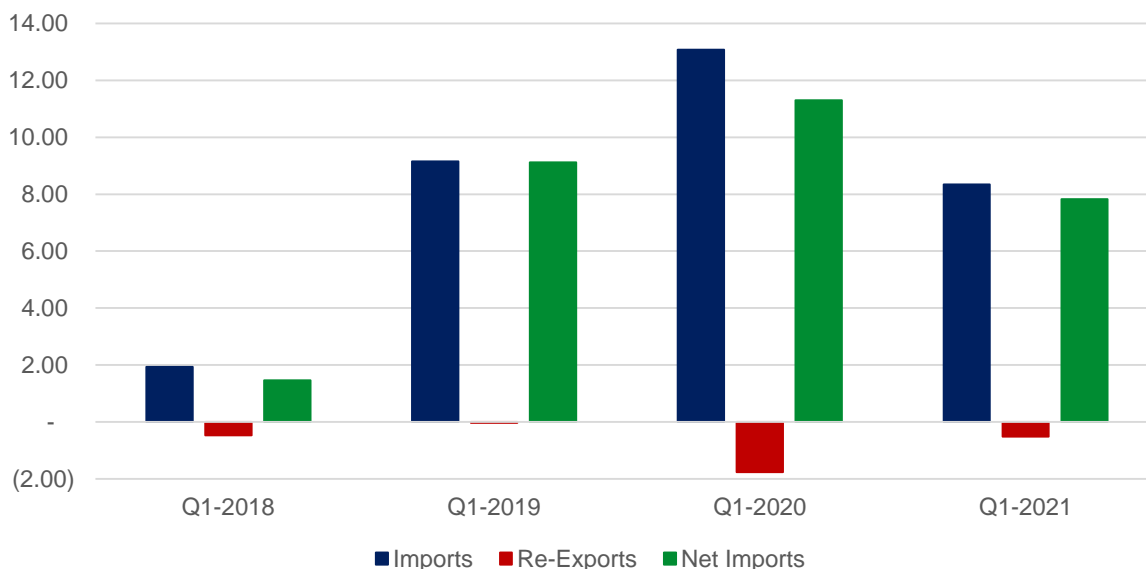
In short, Gazprom's combined pipeline and LNG sales to the four markets of North-Western Europe in 2018, 2019, and 2020 were all higher than in 2017, despite exports from Yamal LNG ramping up from zero to full capacity during that timeframe, with the additional point that Gazprom's new LNG sales to the region were most likely driven by its own access to LNG from Yamal. However, Gazprom could legitimately argue that its sales to the region could have been even higher, had Yamal LNG cargoes not been available. The key to that hypothetical Yamal-free scenario is whether a) the absence of Yamal cargoes would have tightened the European market sufficiently to raise prices to a level that would have resulted in US LNG cargoes being delivered to Europe rather than being shut in, and b) whether in that scenario, Gazprom would have competed strongly or held back for fear of damaging the profitability of its extensive long-term contract portfolio.



### 5.6. LNG dynamics in North-Western Europe in Q1-2021

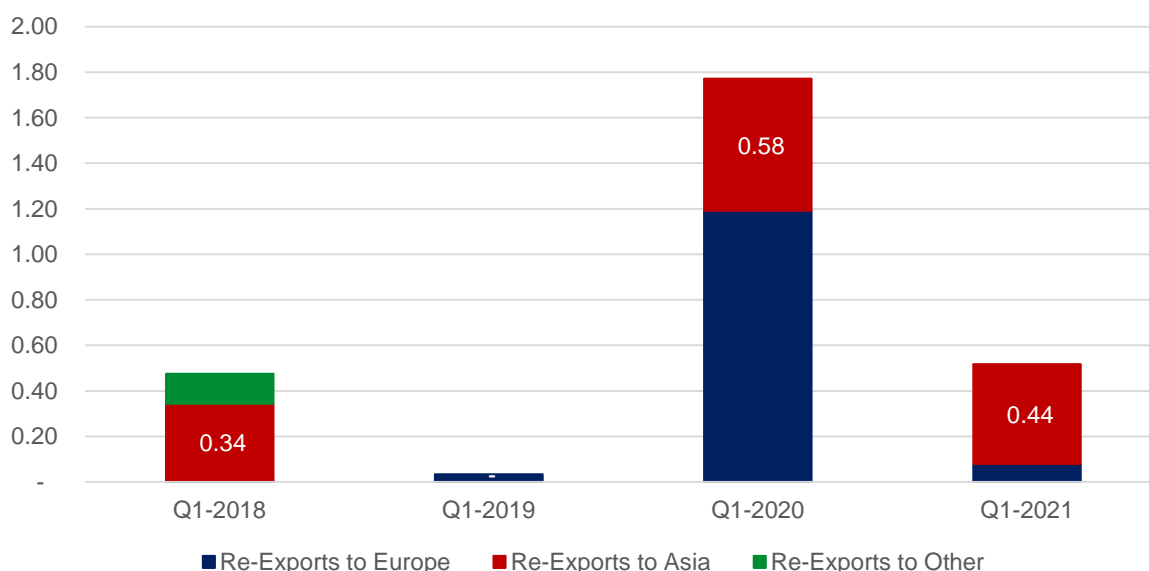
Considering the year-on-year changes in Q1 LNG flows into North-Western Europe in recent years, Fig.14 shows that total LNG imports surged in Q1-2020, as Europe absorbed cargoes from a supply-long global LNG market. But these fell back in Q1-2021 as Asia drew cargoes away from Europe - January 2021 was a record month for Asian LNG import volumes. However, as Fig. 15 illustrates, once LNG cargoes reached Europe, they tended to stay there: Either re-exports were limited or, as in Q1-2020, a significant proportion of re-exports were delivered to other European destinations.

**Figure 14: LNG flows in North-Western Europe in Q1, 2018-2021 (mt)**



OIES research based on data from Kpler.<sup>108</sup>

**Figure 15: LNG re-exports from North-Western Europe by destination (mt)**



OIES research based on data from Kpler.<sup>109</sup>

<sup>108</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

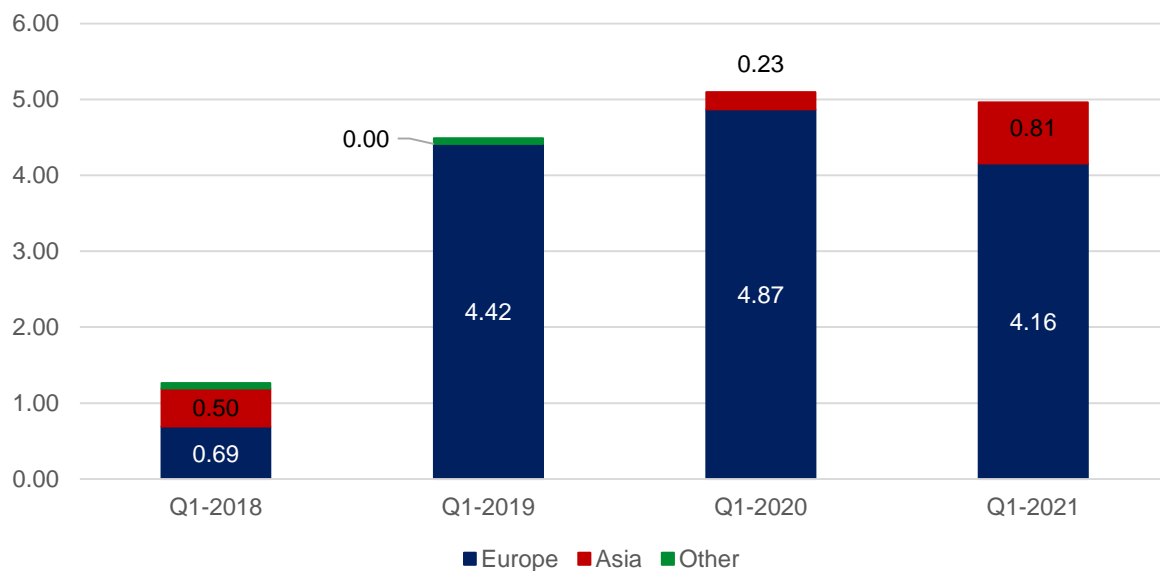
<sup>109</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



In this context, direct deliveries from Yamal LNG to Asia in Q1 have remained limited in the past several years, with most volumes being delivered to Europe: In the past three years, Q1 exports from Yamal LNG to Europe have exceeded 4 mt of LNG, while direct exports to Asia have not exceeded 0.81 mt. Given that total re-exports from North-Western Europe to Asia were just 0.58 mt in Q1-2020 and 0.44 mt in Q1-2021, this is (theoretically) the maximum volume of Yamal LNG that was imported into North-Western Europe and then re-exported to Asia, although the actual volumes are likely to be smaller. For example, it is unlikely that only cargoes from Yamal LNG were re-exported, while cargoes from other suppliers remained in Europe.

Given that Yamal LNG was the source for 36 per cent of LNG imports into North-Western Europe in Q1-2021, if Yamal cargoes also accounted for 36 per cent of re-exports, this would place re-exports of Yamal LNG cargoes from Europe to Asia at 0.16 mt. As illustrated in Fig. 16 (below) supplies from Yamal LNG to North-Western Europe totalled 4.16 mt in Q1-2021, while supplies to Asia totalled 0.81 mt. If 0.16 mt is re-assigned from Europe to Asia as re-exports, the net volume of Yamal LNG supplied to North-Western Europe falls to 4.0 mt. By contrast, when this volume of re-exports is re-assigned to Asia, the net flow from Yamal to Asia rises from 0.81 mt to 0.96 mt. Even if the entirety of re-exports from North-Western Europe to Asia (0.44 mt, in Fig.15 above) consisted only of cargoes from Yamal LNG, net supplies from Yamal LNG to North-Western Europe would only fall to 3.72 mt (the equivalent of 5.1 bcm of natural gas), while supplies from Yamal LNG to Asia would only rise to 1.25 mt (1.7 bcm). The key point to be reiterated here is that the vast majority of cargoes from Yamal LNG were delivered to Europe in Q1-2021, and the limited volume of re-exports from North-Western Europe to Asia meant that the overwhelming majority of those Yamal cargoes remained in Europe.

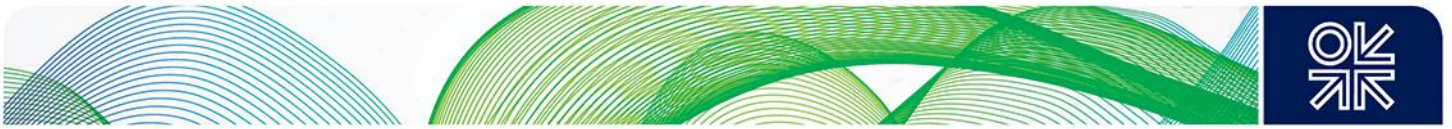
**Figure 16: Yamal LNG exports by destination (mt)**



OIES research based on data from Kpler.<sup>110</sup>

Because both the European and Asia markets tightened in quick succession in winter 2020/21, the spread between the two remained relatively narrow, except for a short-lived spike in January 2021 (see Fig. 23, later in this paper). Although North-Western Europe as a whole lost LNG cargoes to Asia in Q1-2021, these were generally not Yamal LNG cargoes. The headline figures are that even though LNG imports into North-Western Europe fell by almost 5 mt between Q1-2020 and Q1-2021 (from 13.1 mt to 8.4 mt, as shown in Fig. 14), Yamal LNG deliveries to NW Europe fell by just 0.7 mt in that time

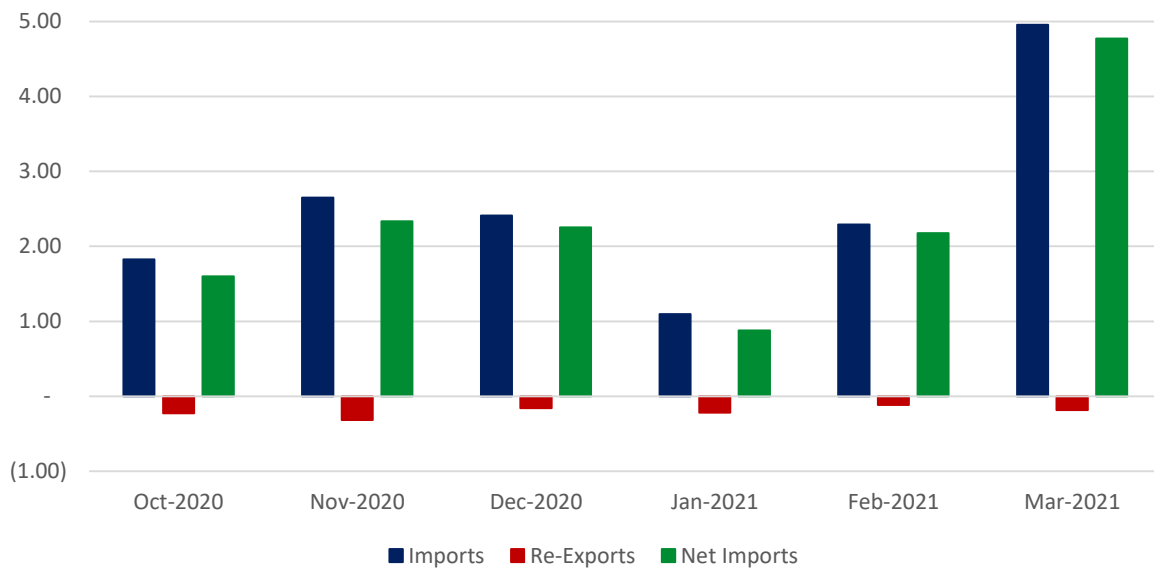
<sup>110</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



(Fig. 16). And, as demonstrated earlier, once Yamal LNG cargoes reached Europe, they generally stayed there, in both Q1-2020 and Q1-2021.

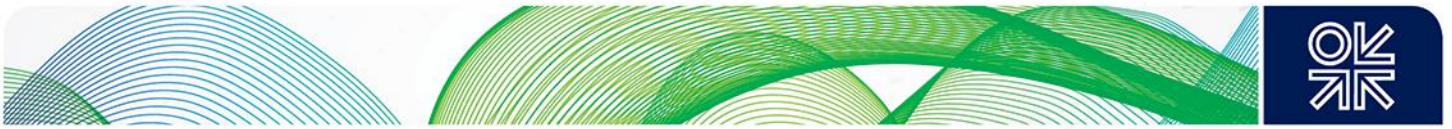
Considering the winter of 2020/21 in more detail, Fig. 17 (below) below clearly shows the drop in LNG imports in January 2021 (the record month for LNG imports into North-East Asia) and the substantial rebound in March 2021. As Fig. 18 demonstrates, re-exports from North-Western Europe to any market other than Asia virtually vanished in December 2020 and January 2021, to match the Asian peak. Yet even in January 2021 – when the Asian demand for LNG was at its peak – re-exports from North-Western Europe to Asia totalled 0.21 mt (19 per cent of total imports into North-Western Europe). In December 2020, 6 per cent of imports into the seven terminals of North-Western Europe were re-exported to Asia, while in February and March 2021 that figure was 3.0-3.5 per cent. The actual volumes of re-exports to Asia did not vary greatly (see Fig. 18), but the fluctuating gross volumes arriving in North-Western Europe meant that the percentage share of Asian re-exports in gross imports did increase dramatically in January 2021, before falling back again in February and March.

**Figure 17: LNG flows in North-Western Europe in winter 2020/21 (mt)**

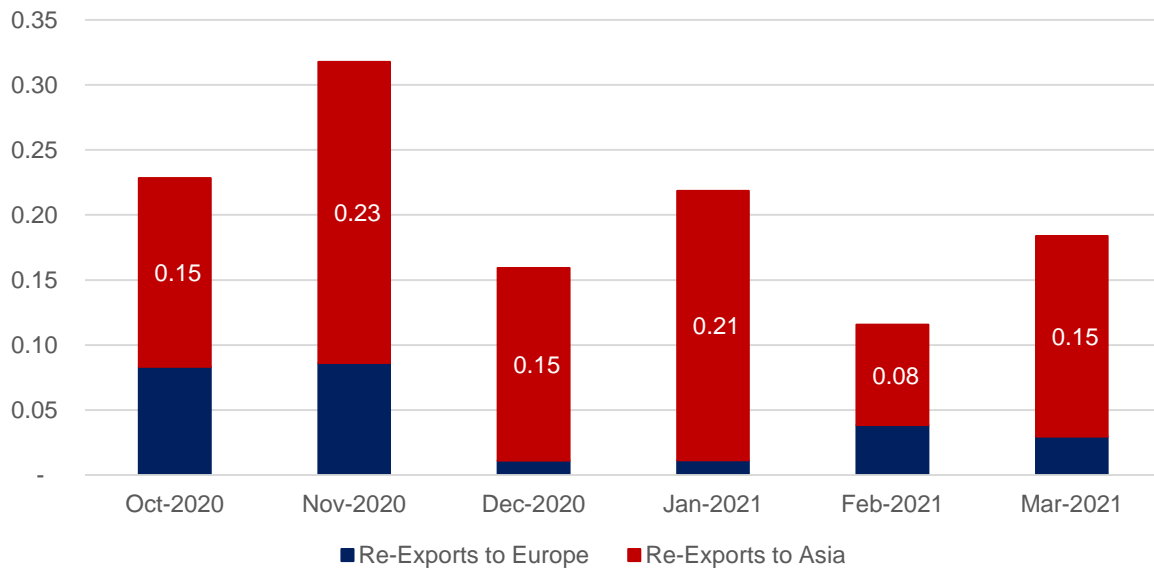


OIES research based on data from Kpler.<sup>111</sup>

<sup>111</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



**Figure18: LNG re-exports from North-Western Europe by destination in winter 2020/21 (mt)**



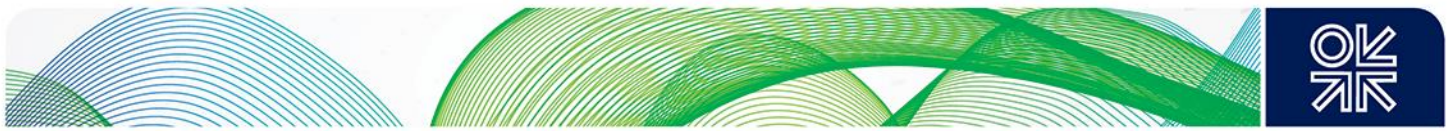
OIES research based on data from Kpler.<sup>112</sup>

Finally, when considering Yamal LNG exports by destination, the deliveries to Asia were actually rather consistent between October 2020 and January 2021, before dropping in February and March 2021 (see Fig. 19). This reflects the fact that it was cargoes from suppliers other than Yamal LNG that switched their delivery destinations from Europe to Asia to service the surge in Asian demand. By contrast, the surge in Yamal LNG deliveries to a particular market actually targeted Europe in February and March 2021, with supplies that were shipped onward to Asia in the previous four months staying in Europe, as European storage stocks were drawn down and demand remained substantial.

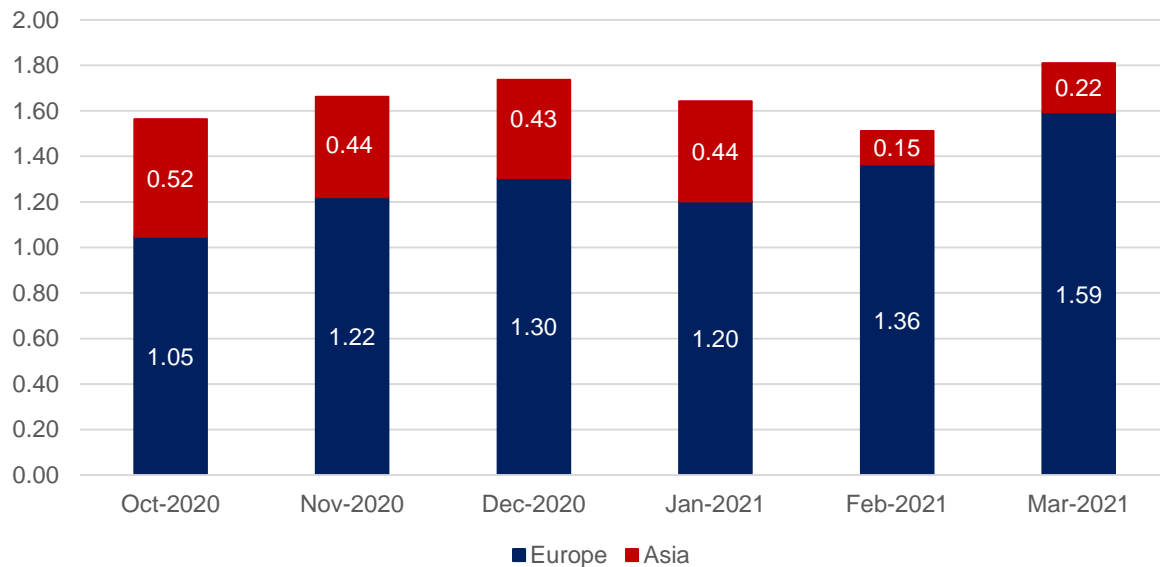
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<sup>112</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)





**Figure 19: Yamal LNG exports by destination (mt)**



OIES research based on data from Kpler.<sup>113</sup>

This leads to the overall conclusion that, despite the surge in Asian LNG demand in December 2020 and January 2021, cargoes from Yamal LNG throughout winter 2020/21 were generally directed to Europe and, once they arrived in Europe, they generally stayed there. This is a key point: If Yamal LNG cargoes were not re-exported from Europe to Asia when Asian LNG demand was at its peak, those Yamal LNG cargoes are unlikely to be re-exported when Asian LNG demand is weaker relative to European LNG demand. As shall be discussed in the following section, this lack of re-exports from Europe to Asia was due to a combination of factors: Operational constraints regarding delivery routes from Yamal, the offtake contracts linked to the project, and the price spreads between Europe and Asia.

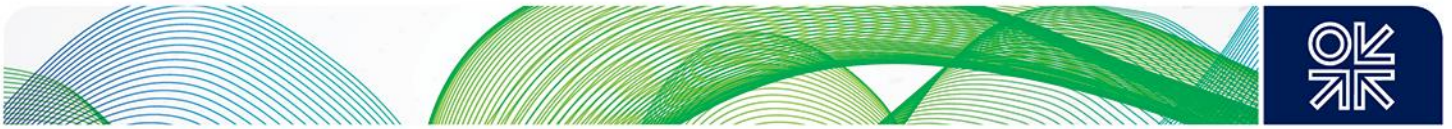
## 6. Why did Yamal flow to Europe?

### 6.1. Operational constraints and the Northern Sea Route

An important element that determines the split in deliveries of LNG from Yamal between Europe and Asia is a physical constraint introduced by a seasonally-limited navigation window through the Northern Sea Route. When delivered via the Northern Sea Route, the delivery time from Yamal to China is comparable to delivery times from Qatar and the west coast of the United States, but longer than delivery times from Australia and Indonesia. By comparison, the journey from Yamal to China via Europe, the Suez Canal, Gulf of Aden, and Strait of Malacca is far longer.

As the map from Novatek (Fig. 20, below) illustrates, this has a substantial impact on the commercial viability of such deliveries: Novatek estimates the cost of delivery from Yamal to China via the Northern Sea Route at 2.2 USD/MMBtu, and the cost of delivery via Europe at 2.8 USD/MMBtu. Both of these are substantially more expensive than the costs of delivery from Qatar, Australia, and Indonesia, which Novatek estimates at 0.64-0.72 USD/MMBtu. Despite the shorter distance compared to delivery via Europe, the Northern Sea Route requires the use of ice-class LNG carriers, and (often) the support of icebreaker vessels, which adds to the cost of delivery.

<sup>113</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



**Figure 20: Export routes from Yamal LNG to Asia and routes from competing suppliers**

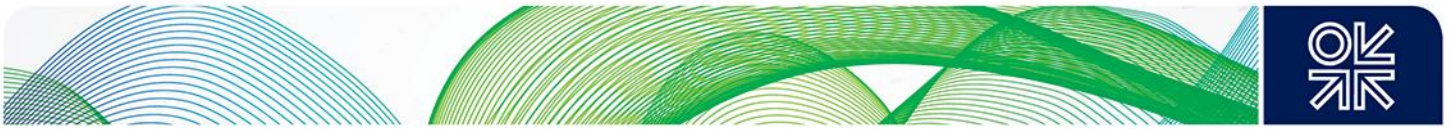


Source: Novatek<sup>114</sup>

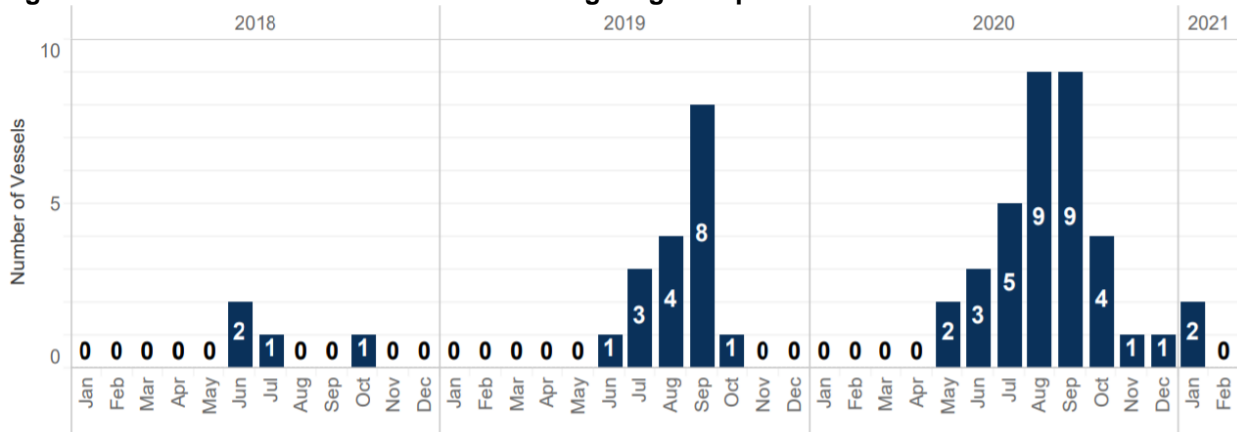
Yamal LNG’s ability to send its liquefied gas westward during the winter season is an absolute must for the project to succeed. When possible, Yamal LNG would like to ship east, with the Northern Sea Route serving as an important Arctic shortcut to reach premium Asian markets. However, for the foreseeable future, the navigation window is likely to be limited to July-November, with June and December as possibilities, depending on the weather. For the rest of the year, Yamal LNG has no other choice but to ship west, to European markets with possible re-exports to Asia if the Asian price premium provides a sufficient marketing signal.

The window of opportunity for using Northern Sea Route expanded during 2020-21 season, as Yamal LNG managed to not only increase the overall number of shipments via the NSR, but also to send its Arc-7 LNG carriers through the Northern Sea Route in December 2020 and January 2021 without the support of nuclear ice breakers (see Fig. 21).

<sup>114</sup> Novatek, 2021. Unlocking Our Arctic Resources: Decarbonizing Our Footprint. Investor Presentation, May 2021. [https://www.novatek.ru/common/upload/doc/IR\\_May\\_2021\\_Investor\\_Meetings\\_updated.pdf](https://www.novatek.ru/common/upload/doc/IR_May_2021_Investor_Meetings_updated.pdf) (see page 14)



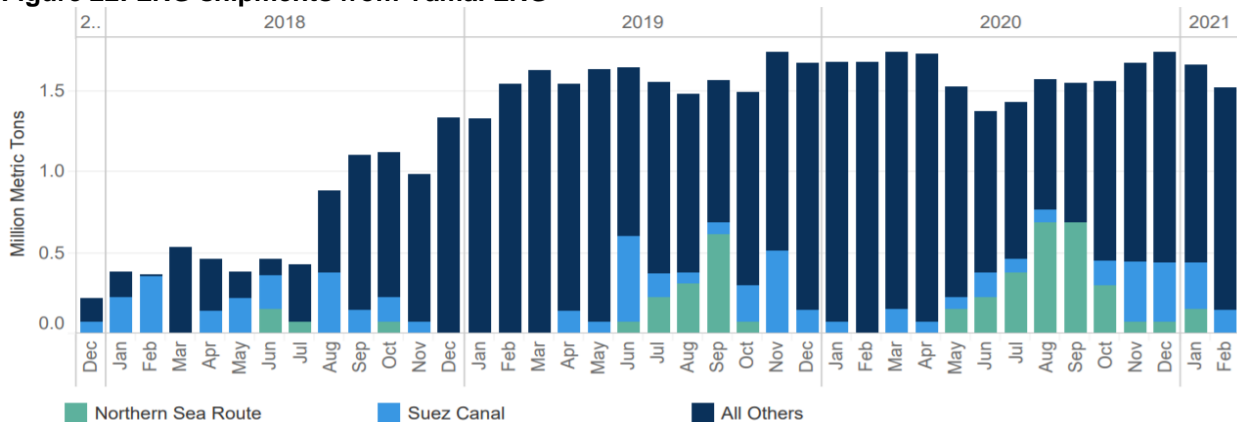
**Figure 21: Number of Yamal LNG carriers navigating NSR per month**



Source: Kpler<sup>115</sup>

These shipments, however, represent only limited share of overall deliveries. The long-haul shipments to Asia via the Suez Channel are costly and have been limited by relatively narrow Europe-Asia price differentials in 2019-20. During these years, Europe (which accounts for the lion’s share of “all others” in Kpler’s statistics) remained the prime destination for LNG from Yamal (see Fig. 22 and refer back to Fig. 3).

**Figure 22: LNG shipments from Yamal LNG**



Source: Kpler<sup>116</sup>

Novatek is currently building two LNG trans-shipment facilities in northern Russia, one at each end of the ‘Northern Sea Route’ (Murmansk and Kamchatka) which would enable more efficient use of Arctic class Arc-7 LNG carriers for Yamal LNG and the upcoming series of Arctic LNG projects. In June 2021, Total Energies signed an agreement to purchase 10 per cent of the project company, Arctic Transshipment LLC.<sup>117</sup> This will reduce the need for trans-shipment agreements such as that in place at Zeebrugge. In April 2021, Novatek announced that each of the Arctic LNG shareholders had concluded 20-year Sale and Purchase Agreements (SPAs) with each of the project participants: “The SPAs provide for LNG supplies from Arctic LNG 2 on FOB Murmansk and FOB Kamchatka basis with pricing formulas linked to international oil and gas benchmarks. The LNG offtake volumes are set in

<sup>115</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>116</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>117</sup> Novatek, 2021. *NOVATEK and TotalEnergies Sign Share Purchase Agreement on 10% Stake in Arctic Transshipment LLC*. Press Release, 3 June. [https://www.novatek.ru/en/press/releases/archive/index.php?id\\_4=4500](https://www.novatek.ru/en/press/releases/archive/index.php?id_4=4500)



proportion to the respective participants' ownership stakes in the Project".<sup>118 119</sup> Once the three-train project reaches its full 19.8 mtpa capacity, Novatek's 60 per cent shareholding will provide it with 11.88 mtpa of LNG supply. Between February and June 2021, Novatek signed SPAs with Zhejiang Energy and Shenergy Group for deliveries to China and Glencore for deliveries to 'a number of destinations in East Asia' totalling 4.5 mtpa.<sup>120</sup>

## 6.2. Yamal LNG shareholders and offtake contracts

To a certain extent, the delivery destinations for Yamal LNG cargoes reflect the long-term contracts associated with Yamal LNG, which, in turn, somewhat reflects the ownership structure of the project. As noted earlier, the combined interests of the Chinese participants in Yamal LNG project are almost 30 per cent, while Total's share accounts for 20 per cent, leaving Novatek with a 50.1 per cent stake.

According to Kpler, the holders of long-term contracts for offtake from Yamal LNG are: Total Energies (4 mtpa), Naturgy (formerly Gas Natural Fenosa) (2.5 mtpa), Shell (0.9 mtpa), Gazprom (3 mtpa), Novatek (2.5 mtpa), and PetroChina (3 mtpa). Those contracts – which have a combined volume of 15.9 mtpa – are all valid from 1 July 2018, with end dates between 31 May 2038 and 31 May 2045. All the contracts are DES (Delivered Ex Ship) with specific delivery destinations, except for the contract with Total Energies, which is listed as FOB/DES, which gives Total Energies greater discretion over where to send its cargoes.<sup>121</sup> Those contracts cover 96.4 per cent of the nameplate capacity of Yamal LNG, with the remainder intentionally left for spot sales.

The 'simple parts of the equation' suggest that the 3 mtpa contract with PetroChina matches the 3 mt supplied to Asia from Yamal LNG in 2019 and accounted for three-quarters of the volume supplied to Asia from Yamal LNG in 2020, and the 2.5 mtpa contract with Naturgy reflects the volumes supplied to Spain in 2019 and 2020. However, the remaining 10.4 mtpa of contracts held by Novatek, Gazprom, Total Energies, and Shell require further consideration. The contracts held by Total Energies and Shell are the likely drivers of the delivery of Yamal LNG cargoes to France and the Netherlands, respectively, but this cannot be confirmed as the contractual delivery destinations have not been made public.

Gazprom has also not publicly stated the contractual delivery destinations for the cargoes it receives under its LTC with Yamal LNG. However, it has reported that its total LNG sales (including from trading subsidiaries) were 3.3-3.9 mtpa in 2016-2018, which were almost entirely delivered to non-European markets, apart from one cargo to Spain in 2017 and another in 2018. Then, in 2019, its LNG sales to Europe (UK and Spain) jumped to 0.7 mt, and finally, in 2020, its European LNG sales (to Belgium, UK, Greece, Spain, the Netherlands, and France) reached 2.7 mt – Close to the volume of its 3 mtpa contract with Yamal LNG.<sup>122</sup>

For the purposes of marketing its LNG from Yamal, Novatek signed a 1 mtpa contract with ENGIE in June 2015, to deliver cargoes to the Montoir-de-Bretagne LNG terminal in France, for transshipment onto ENGIE's LNG carrier fleet.<sup>123</sup> This was matched by a transshipment agreement signed between

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<sup>118</sup> The Project's participants include: NOVATEK (60%), TOTAL (10%), CNPC (10%), CNOOC Limited (10%) and the Japan Arctic LNG, consortium of Mitsui & Co., Ltd. and JOGMEC (10%).

<sup>119</sup> Novatek, 2021. Arctic LNG 2 Participants Conclude Long-Term Offtake Agreements. *Press Release*, 28 April. [https://www.novatek.ru/en/press/releases/archive/index.php?id\\_4=4432&afrom\\_4=01.01.2021&ato\\_4=26.06.2021&from\\_4=2&\\_id=1624693120597](https://www.novatek.ru/en/press/releases/archive/index.php?id_4=4432&afrom_4=01.01.2021&ato_4=26.06.2021&from_4=2&_id=1624693120597)

<sup>120</sup> See Novatek press releases for February and June 2021, available here: <https://www.novatek.ru/en/press/releases/>

<sup>121</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)

<sup>122</sup> Gazprom, 2021. *Gazprom in Figures 2016-2020*. <https://www.gazprom.com/f/posts/45/961659/gazprom-in-figures-2016-2020-en.pdf> (see page 87)

<sup>123</sup> Novatek, 2015. NOVATEK concludes long-term LNG contract with ENGIE. *Press Release*, 2 June. [https://www.novatek.ru/en/press/releases/index.php?id\\_4=970](https://www.novatek.ru/en/press/releases/index.php?id_4=970)



Novatek and Elengy, the operator of the Montoir terminal.<sup>124</sup> This leaves a further 1.5 mtpa available to Novatek from its Yamal LNG offtake.

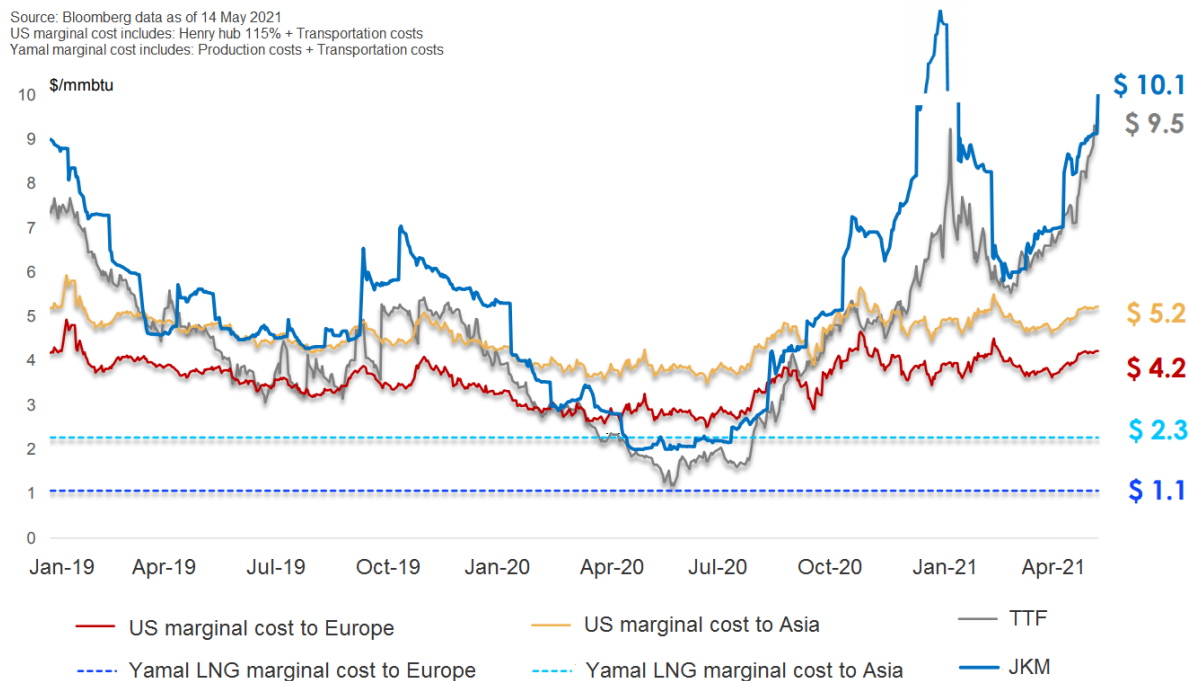
Put simply, the current operational constraints regarding the use of the Northern Sea Route mean that, until Novatek’s transshipment facilities are completed and the navigation season is extended, the majority of Yamal LNG cargoes will flow to Europe as their initial port of call, even if that is not their final destination. Aside from Naturgy and CNPC (which are likely to require the cargoes in their ‘home’ markets), the decisions taken by the remaining Yamal LNG off-takers (Novatek, Gazprom, Total, and Shell) about whether to retain their cargoes in Europe or send them on to Asia are largely determined by the price spreads between those two markets.

### 6.3. The Europe-Asia LNG price spread

As discussed earlier, the cost of shipping from Yamal LNG to Asia is substantial. As Fig. 20 illustrated, Novatek estimates the cost of delivery via the Northern Sea Route (with support from nuclear-powered ice-breakers) at 2.2 USD/MMBtu, and the much longer delivery via Europe (including transshipment in Europe) at 2.8 USD/MMBtu. Asia may be the long-term growth market for LNG, but Novatek needs a sufficient spread to make it attractive in comparison to Europe.

In an Investor Presentation in May 2021, Novatek suggested that (as of 14 May 2021), the marginal cost of Yamal LNG to Europe was 1.10 USD/MMBtu while the marginal cost of Yamal LNG to Asia was 2.30 USD/MMBtu. This suggests that Yamal LNG needs a Europe-Asia price spread of at least 1.20 USD/MMBtu to make exports to Asia more profitable than exports to Europe.

**Figure 23: Marginal Cost Comparison: Yamal LNG vs US LNG Projects (USD/MMBtu)**



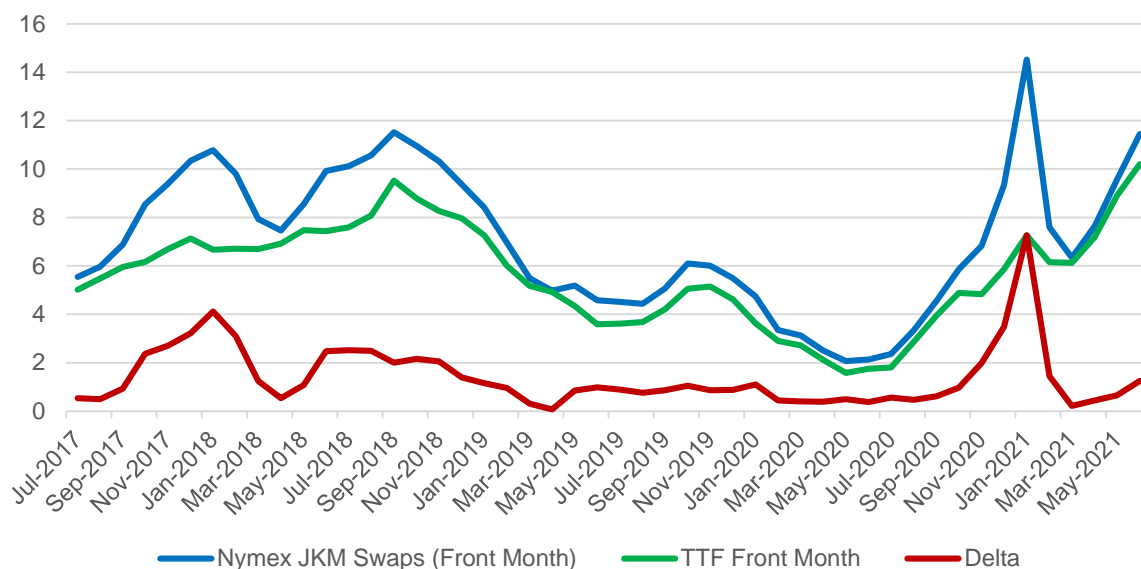
Source: Novatek<sup>125</sup>

<sup>124</sup> Elengy, 2015. Elengy Signs a Transshipment Long-Term Contract with Novatek Gas & Power. *Press Release*, 2 June. <https://www.elengy.com/en/news/news/commercial/150-elengy-signs-a-transshipment-long-term-contract-with-novatek-gas-power.html>

<sup>125</sup> Novatek, 2021. Unlocking Our Arctic Resources: Decarbonizing Our Footprint. Investor Presentation, May 2021. [https://www.novatek.ru/common/upload/doc/IR\\_May\\_2021\\_Investor\\_Meetings\\_updated.pdf](https://www.novatek.ru/common/upload/doc/IR_May_2021_Investor_Meetings_updated.pdf) (see page 15)



**Figure 24: LNG Benchmarks: TTF and JKM and the Spread Between the Two (USD/MMBtu)**



OIES research based on data from Refinitiv.<sup>126</sup>

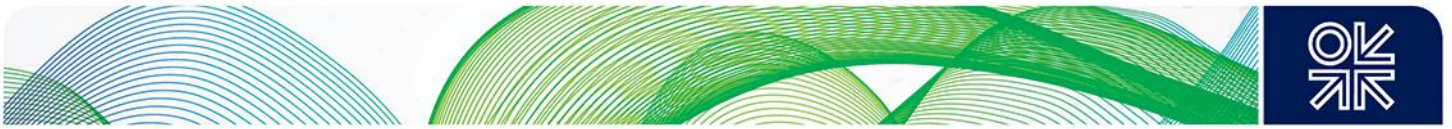
As the graph above demonstrates, the first winter of operation for the first train of Yamal LNG (2017/18) appeared to be auspicious: Asian prices reached relatively high levels and the spread between JKM and TTF widened to just over 4 USD/MMBtu in January 2018, while spreads of at least 2 USD/MMBtu from October 2017 to February 2018 seemed healthy enough. However, twelve months later, the picture was far less rosy.

From February 2019 to October 2020, the spread between JKM and TTF was less than 1 USD/MMBtu in all but two months, and averaged just 0.68 USD/MMBtu for the whole of that period. The spread widened over the winter as Asian prices rose sharply in December 2020 and January 2021, but, as Asian prices receded and European prices rose, the two converged again. Indeed, the spread reached a low point of just 0.22 USD/MMBtu in March 2021, and the average spread for the period February to June 2021 was 0.80 USD/MMBtu.

Taking a broader view, in the period from January 2019 (the start of the first full calendar year in which Yamal LNG operated full capacity) to June 2021 (the most recent data), the average spread between JKM and TTF (monthly average front month) prices was 1.07 USD/MMBtu. Given that this average spread is less than the difference between the marginal costs of Yamal LNG to Europe and to Asia (1.20 USD/MMBtu), it is hardly surprising that many Yamal LNG cargoes, having reached Europe for transshipment, remained there.

Indeed, the commercial reality of the balance between the cost of delivery and the prices attainable in Europe and Asia drives home a key point of this paper: once the ownership of an LNG cargo has passed into the hands of the off-takers, neither the Russian government nor Novatek can exert control over where those cargoes will go. Rather, there will always be a 'gravitational pull' towards the most profitable market. This point highlights a major difference between Yamal LNG and (for example) Qatargas: Qatar is (relatively) geographically equidistant between Europe and Asia, and thus does not require particularly wide spreads between prices in Europe and Asia in order to re-direct cargoes from one market to another. By contrast, the delivery costs from Yamal and the need for transshipment in Europe in the absence of flows via the Northern Sea Route mean that Europe will always be the preferred market for Yamal cargoes, unless the Europe-Asia spread is particularly wide. Therefore, LNG supplies from Qatar may be finely balanced between Europe and Asia, while for Yamal LNG, the European

<sup>126</sup> Refinitiv, 2021. *Eikon Refinitiv Platform*. <https://eikon.thomsonreuters.com/index.html> (subscription required)



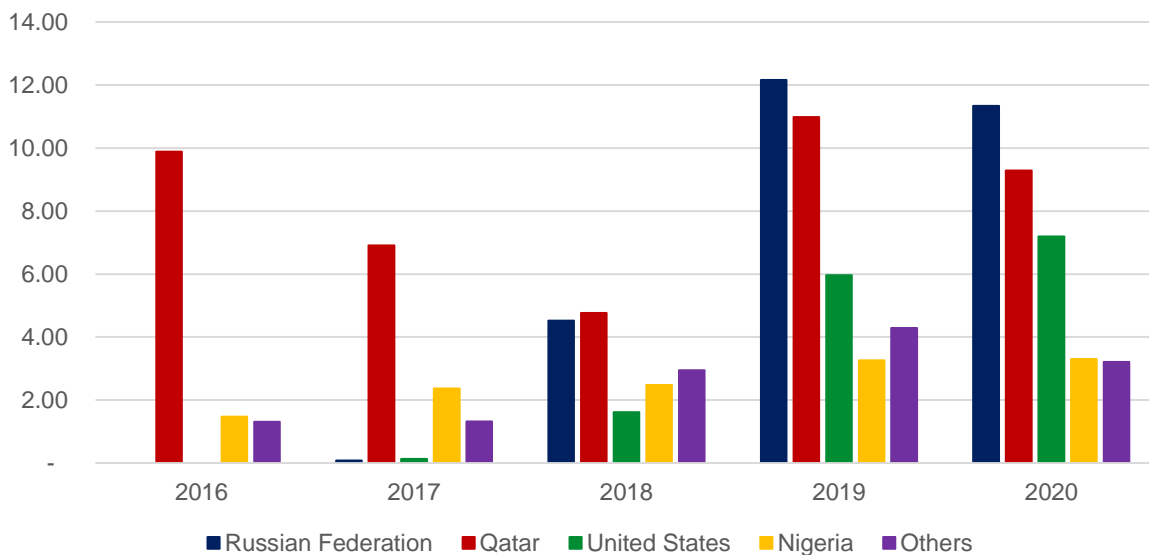
market is likely to continue to exert a stronger gravitational pull than Asia. This ‘inconvenient truth’ for Russian policymakers means that cargoes from Yamal are likely to remain among those from a range of suppliers that compete with Gazprom on the European market, which in turn has significant implications for the substantial expansion of LNG export capacity planned by Novatek with regard to its Arctic LNG projects.

## 7. Competition in NW Europe: Implications for Russian LNG exports

The preceding discussion has generated several key points: Firstly, the available data suggests that cargoes from Yamal LNG have been overwhelmingly delivered to Europe, and have generally not been re-exported to Asia. This situation will persist until such time as the regional price spread between Europe and Asia is sufficient to offset the higher delivery costs. Secondly, while the arrival of Yamal LNG cargoes to North-Western Europe did not cause Gazprom’s pipeline sales to the region to decline significantly, it seems that those Yamal LNG cargoes have competed with Gazprom’s pipeline supplies to a certain extent, while at the same time competing with LNG cargoes offered by other suppliers.

Fig. 25 (below) shows combined annual LNG imports into seven terminals in North-Western Europe (Montoir, Dunkerque, Zeebrugge, GATE Rotterdam, Isle of Grain, Dragon, and South Hook). As Yamal LNG ramped up its deliveries to those seven terminals in 2018 and 2019, the other major suppliers to those terminals (Qatar, the United States, Nigeria, and the combined volumes from other suppliers) all exhibited year-on-year growth in deliveries. So, in the first two years of its operation, Yamal LNG carved out a space for itself in a rising market, as total imports to the region grew from 10.8 mt in 2017 (bearing in mind that Yamal LNG was launched in mid-December 2017) to 16.3 mt in 2018 and 36.3 mt in 2019. In 2020, supplies from Qatar, Russia, and the combined ‘others’ fell while supplies from the United States rose, as total imports into the region fell to 34.3 mt.

**Figure 25: Annual LNG imports into North-Western Europe by Supplier, 2017-2020 (mtpa)**



OIES research based on data from Kpler.<sup>127</sup>

Taken together with the discussion in section 5, this suggests that Yamal LNG cargoes in North-Western Europe are not only able to compete with Gazprom’s pipeline supplies, but also with LNG cargoes offered by other suppliers, most notably Qatar and the United States. With Arctic LNG 2 planned for launch between 2024 and 2026, any repeat of the Yamal experience (of cargoes being

<sup>127</sup> Kpler, 2021. *LNG Platform*. <https://lng.kpler.com/> (subscription required)



'held' in Europe by insufficient pricing spreads between Europe and Asia) would imply Russian LNG carving out an even greater market share for itself in Europe. This, in turn, has significant implications for both Gazprom and the overarching gas export strategy of the Russian government, and the extent to which it is willing or able to reduce the competition between the two – A task made all the more difficult by the potential for substantial Gazprom LNG cargoes from Baltic LNG arriving onto the European market at the same time as Novatek's supplies from Arctic LNG 2.

### **Conclusion: Tacit acceptance of Russian LNG in Europe by the Kremlin?**

As the analysis in this paper suggests, Russia's long-held reluctance to allow large-scale exports of Russian LNG to Europe because this might 'cannibalise' Russian pipeline exports seems to be going through a revision process. It appears that Russian strategists now recognize that Russian pipeline gas will have to compete with LNG in Europe on a large scale; and it is better to pre-empt US LNG (or any other non-Russian LNG) imports to Europe by having Russian LNG compete at the regasification terminals than to give up all market niches (particularly those not necessarily accessible by pipeline gas) to competitors without a fight because of restrictive Russian regulation. Gazprom has been vocal about the dangers for Russian state revenues of Russian pipeline gas competing with Russian LNG in Europe, but these arguments now seem to be falling on deaf ears in the Kremlin. Indeed, the Energy Strategy to 2035 (2020), LNG Development Strategy (2021), and public pronouncements by the Ministry of Energy suggest that the long-term trajectory is firmly in favour of LNG expansion.

Therefore, it seems that with regard to the issue of possible competition between Russian pipeline gas and LNG in Europe the Kremlin has taken the practical approach of ranking efficiency and commerciality above the turf battles over which company delivers the export sales. However, one important difference between pipeline exports and LNG should be noted, namely that pipeline exports are subject to a 30 per cent export tax (payable to the Russian budget) and LNG exports are not. It is therefore plausible to speculate that once LNG exports start to represent a larger share of Russia's overall gas exports the Russian government may reconsider a revision of the terms of the tax take. This would, of course, have substantial (and potentially serious) implications for the profitability of Russia's LNG exports, which have thus far enjoyed a commercially-beneficial tax regime.

It would appear that the Russian government fully understands that LNG must play a more important role in the country's gas export strategy and has set aggressive targets to achieve this. Furthermore, it would also seem that, although the Kremlin has initially favoured Novatek as its LNG leader, this is mainly because it has performed well to date. The Russian export strategy does not preclude the involvement of other companies, especially Gazprom, if a rational and commercially effective strategy can be developed. Russian LNG can offset risks to Russia in the core European market, it is not seen by the government as a real threat to pipeline exports, and it can offer both diversity and development of markets in Asia and other regions, such as South America. As a result, LNG is viewed as increasingly necessary to support Russia's overarching gas export strategy, with the key proviso that any projects must be commercially viable and competitive if they are to have a positive impact.

At the beginning of this paper, we raised the question of whether the notion of Russian LNG competing with Russian pipeline gas in Europe was a genuine threat, or merely a 'phantom menace', and whether the Russian government would take action to address the situation. As we have demonstrated, competition between pipeline gas and LNG in Europe is real, but once Russian LNG enters the global market it becomes – to all intents and purposes – indistinguishable from LNG from other sources. If Gazprom's pipeline gas supplies face competition in Europe, it is from LNG in general, not just specifically from Yamal. Furthermore, if Gazprom suffers from that competition, then it would suffer whether the LNG cargoes were arriving from Yamal, the US Gulf Coast, Ras Laffan, or anywhere else. With its latest strategy documents and public pronouncements, the Russian government has come down firmly on the side of Russian LNG expansion and in doing so, implicitly recognises that it could not control the destination of Russia's LNG exports – and thus prevent them from competing with Gazprom's pipeline deliveries to Europe – even if it wanted to.



## Appendix 1. Russian LNG Projects

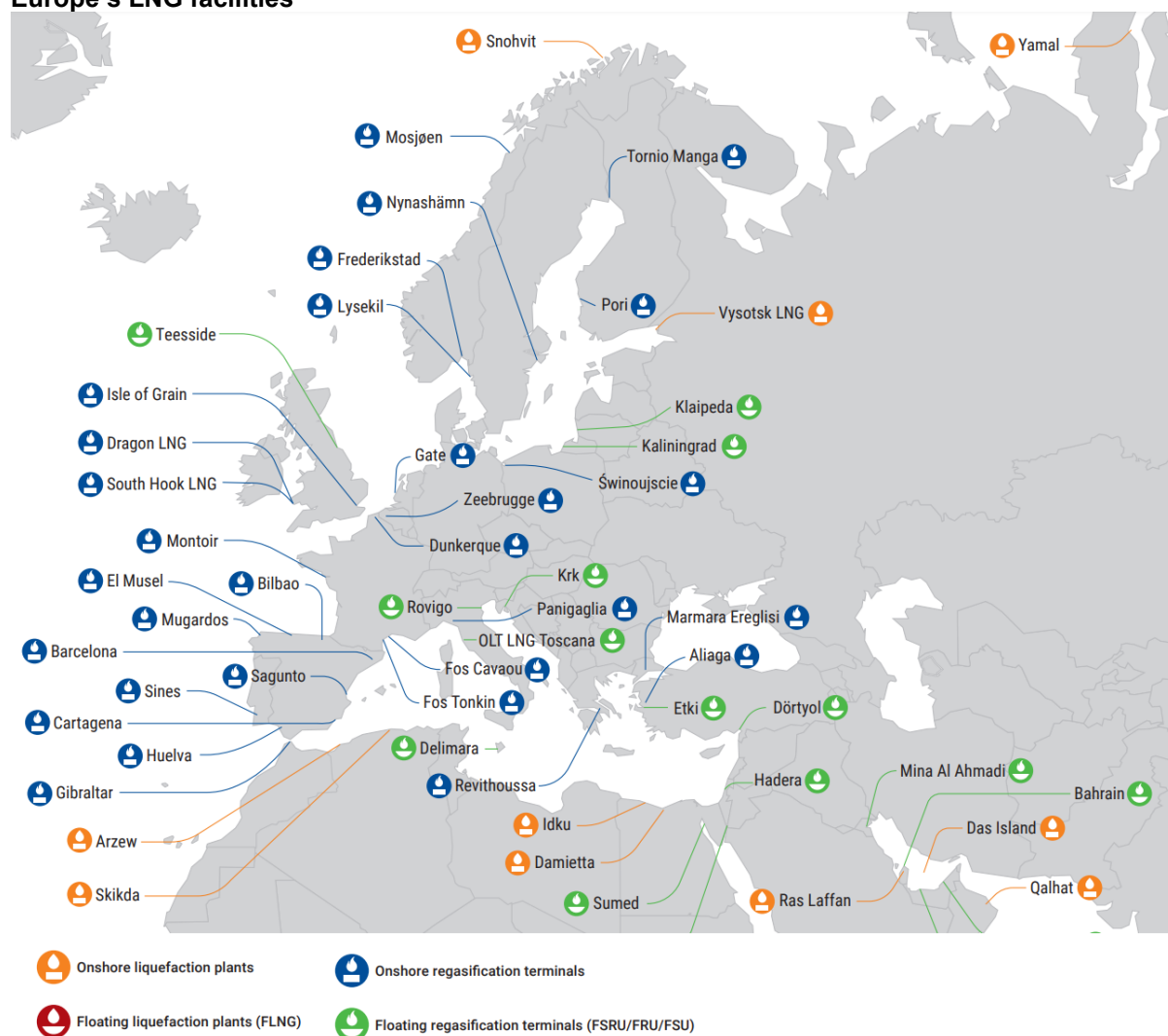
The following table contains all of the LNG projects listed in the Russian government LNG strategy, which was published in March 2021. The projects are categorised as 'In Operation', 'Under Construction', 'Probable', 'Possible', and 'Probability Cannot Be Estimated at the Current Time'.

<b>LNG Projects In Operation</b>				
<i>Project Name</i>	<i>Company</i>	<i>Location</i>	<i>Capacity</i>	<i>Launch</i>
Sakhalin-2	Gazprom	Far Eastern Russia	9.6 mtpa	2009
Yamal LNG	Novatek	Northern Russia	16.5 mtpa	2018
Vysotsk LNG	Novatek	Baltic Sea	0.66 mtpa	2019
Yamal LNG (Train 4)	Novatek	Northern Russia	0.9 mtpa	2021
<i>Total Capacity</i>	-	-	<i>27.66 mtpa</i>	-
<b>LNG Projects Under Construction</b>				
<i>Project Name</i>	<i>Company</i>	<i>Location</i>	<i>Capacity</i>	<i>Launch</i>
Portovaya LNG	Gazprom	Baltic Sea	1.5 mtpa	2021
Arctic LNG 2	Novatek	Northern Russia	19.8 mtpa	2023-2025
<i>Total Capacity</i>	-	-	<i>21.3 mtpa</i>	-
<b>Probable LNG Projects</b>				
<i>Project Name</i>	<i>Company</i>	<i>Location</i>	<i>Capacity</i>	<i>Launch</i>
Obsky LNG	Novatek	Northern Russia	5-6 mtpa	Post-2024
Arctic LNG 1	Novatek	Northern Russia	19.8 mtpa	After 2027
Yakutsk LNG	YATEK	Yakutia	17.7 mtpa	2026-2027
Far Eastern LNG	Rosneft-Exxon	Far Eastern Russia	6.2 mtpa	2027-2028
Ust-Luga	Gazprom	Baltic Sea	13.3 mtpa	2024-2025
<i>Total Capacity</i>	-	-	<i>62-63 mtpa</i>	-
<b>Possible LNG Projects</b>				
<i>Project Name</i>	<i>Company</i>	<i>Location</i>	<i>Capacity</i>	<i>Launch</i>
Arctic LNG 3	Novatek	Northern Russia	19.8 mtpa	Unknown
Sakhalin-2 Expansion	Gazprom	Far Eastern Russia	5.4 mtpa	Post-2027
<i>Total Capacity</i>	-	-	<i>25.2 mtpa</i>	-
<b>Combined capacity of all the projects above</b>			<b>136.2-137.2 mtpa</b>	
<b>Projects Whose Probability Cannot Be Estimated at the Current Time</b>				
<i>Project Name</i>	<i>Company</i>	<i>Location</i>	<i>Capacity</i>	<i>Launch</i>
Tambey-Sabetta	Gazprom	Northern Russia	20.0 mtpa	2030
Pechora LNG	Rosneft	Northern Russia	4.3 mtpa	Project Frozen
Shtokman LNG	Gazprom	Northern Russia	30.0 mtpa	Possible by 2035
Black Sea LNG	Gazprom	Southern Russia	0.5-1.5 mtpa	Possible by 2025
Vladivostok LNG	Gazprom	Far Eastern Russia	1.5 mtpa	Possible by 2025
Far Eastern LNG Expansion	Rosneft-Exxon	Far Eastern Russia	10.0 mtpa	Post-2035
Kara LNG	Rosneft	Northern Russia	30.0 mtpa	2030-2035
Taimyr LNG	Rosneft	Northern Russia	35-50 mtpa	2030-2035
<b>Total Capacity</b>	-	-	<b>131.3-147.3 mtpa</b>	-

## Appendix 2. European Regasification Capacity

At the end of 2020, Europe's nominal regasification capacity stood at 183.8 million ton per annum (19.4 percent of the world's total). North-Western Europe is home to main regasification terminals that mostly supply gas for the European market: Isle of Grain (14.3 mtpa) in the UK, Gate (8.8 mtpa) in Netherlands, Dunkerque (9.6 mtpa) in France, Zeebrugge (6.6 mtpa) in Belgium. South Hook (15.4 mtpa) serves the UK market and is used for transshipment. Montoir-de-Bretagne (8 mtpa) on the French west coast is often used for transshipment and re-exports of LNG out of Europe. Large regasification terminals in Spain serve the captive market in Iberia and are also major transshipment facilities (see below).

### Europe's LNG facilities



Source: GIIGNL<sup>128</sup>

<sup>128</sup> GIIGNL, 2021. Annual Report 2021. [https://giignl.org/system/files/giignl\\_2021\\_annual\\_report\\_may4.pdf](https://giignl.org/system/files/giignl_2021_annual_report_may4.pdf) (see page 59)



### Appendix 3. Shareholder structure of Novatek LNG projects

<u>Stakeholders</u>	<u>Country</u>	<u>Interest (%)</u>
<b>Yamal LNG</b>		
Novatek	Russia	50.1%
Total	France	20.0%
CNPC	China	20.0%
Silk Road Fund	China	9.9%
<b>Arctic LNG 2</b>		
Novatek	Russia	60.0%
Total	France	10.0%
CNPC	China	10.0%
CNOOC	China	10.0%
Japan Arctic LNG (JOGMEC/Mitsui)	Japan	10.0%

OIES research based on information from Novatek<sup>129 130</sup>

<sup>129</sup> Yamal LNG, 2021. *About The Project*. <http://yamallng.ru/en/project/about/>

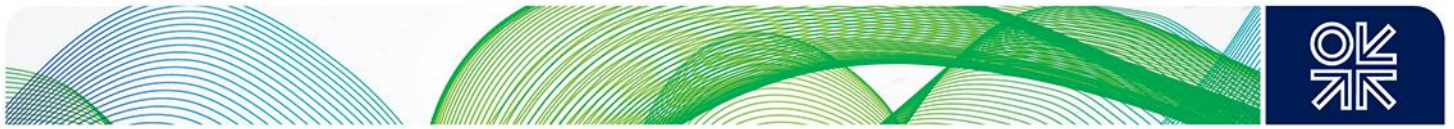
<sup>130</sup> Novatek, 2021. *Project: Arctic LNG 2*. <https://www.novatek.ru/en/business/arctic-lng/>

## Appendix 4. Russian Pipeline Gas Exports, 2016-2020 (bcma)

	2016	2017	2018	2019	2020
China				0.2	4.1
Turkey	24.8	29.0	24.0	15.5	16.4
<b>Western Europe</b>	<b>121.5</b>	<b>126.9</b>	<b>138.4</b>	<b>131.9</b>	<b>119.3</b>
Germany	49.8	53.4	58.5	53.5	45.8
Italy	24.7	23.8	22.8	22.1	20.8
France	11.5	12.3	12.9	14.1	12.4
Finland	2.5	2.4	2.6	2.5	1.6
Austria	6.1	9.1	12.3	14.2	13.2
Greece	2.7	2.9	3.3	2.4	3.0
Netherlands	4.2	4.7	7.9	8.5	11.8
Switzerland	0.3	0.3	0.4	0.3	0.3
Denmark	1.7	1.8	1.7	1.7	1.8
Great Britain	17.9	16.3	14.3	10.3	6.0
Belgium			1.8	2.4	2.5
<b>Central Europe</b>	<b>32.8</b>	<b>36.3</b>	<b>38.4</b>	<b>43.9</b>	<b>39.1</b>
Hungary	5.5	5.8	7.4	10.5	8.6
Poland	11.1	10.5	9.9	9.7	9.7
Slovakia	3.7	4.6	5.1	6.4	8.6
Czechia	4.5	5.8	6.5	8.1	5.0
Romania	1.5	1.2	1.3	1.0	1.0
Bulgaria	3.2	3.3	3.2	2.4	2.3
Serbia	1.7	2.1	2.1	2.1	1.3
Croatia	0.8	2.1	2.0	2.8	1.8
Slovenia	0.5	0.6	0.5	0.3	0.4
Bosnia & Herzegovina	0.2	0.2	0.2	0.2	0.2
Macedonia	0.1	0.1	0.2	0.3	0.1
<b>Total Europe and Turkey</b>	<b>179.0</b>	<b>192.2</b>	<b>200.8</b>	<b>191.4</b>	<b>174.9</b>
<b>Total Far Abroad</b>	<b>179.0</b>	<b>192.2</b>	<b>200.8</b>	<b>191.6</b>	<b>179.0</b>
<b>Total Near Abroad</b>	<b>31.4</b>	<b>33.6</b>	<b>35.7</b>	<b>36.5</b>	<b>30.7</b>
Ukraine	2.4	2.4	2.7	2.8	0.0
Belarus	18.6	19.0	20.3	20.3	18.8
Moldavia	3.0	2.7	2.9	2.9	3.0
Lithuania	0.9	1.4	1.4	0.9	0.9
Latvia	1.3	1.8	1.3	1.7	1.6
Estonia	0.4	0.5	0.4	0.3	0.3
Kazakhstan	2.9	3.0	3.2	5.1	3.4
South Ossetiya	0.0	0.0	0.0	0.0	0.0
Armenia	1.9	2.0	1.9	2.2	2.2
Georgia	0.1	0.1	0.0	0.2	0.1
Kyrgyzstan		0.2	0.3	0.3	0.3
Azerbaijan		0.3	1.0		
<b>Total Russian pipeline exports</b>	<b>210.5</b>	<b>225.9</b>	<b>236.4</b>	<b>228.1</b>	<b>209.7</b>

Source: OIES, data from Gazprom<sup>131</sup>

<sup>131</sup> Reuters, 2021. ТАБЛИЦА-Экспорт Газпрома по странам в 2020г (TABLE: Gazprom exports by country in 2020). Reuters, 15 February. <https://www.reuters.com/article/-2020-idRUL8N2KL3N1>



## Appendix 5. Russian Physical Pipeline Gas Exports in 2017-2020 (bcm)

	<b>Russia to Europe*</b>	<b>Russia to Turkey</b>	<b>Total Physical Exports</b>
2017	166.2	28.6	194.8
2018	171.0	23.6	194.7
2019	178.9	15.2	194.1
2020	145.8	16.2	162.0

OIES research based on data from ENTSOG Transparency Platform and the Energy Market Regulatory Authority of Turkey (via Argus)

\* Note that 'Europe' refers to the EU-27, UK, Switzerland, and non-EU Balkans