The Effects of the Russian-Ukrainian War on Russian Gas Exports to the EU and the Role of Cyprus as an Alternative Gas Provider

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Abstract

Putin's invasion of Ukraine has forced the EU to eradicate its energy dependence on Russia. This is a shift of historic proportions, particularly when it comes to natural gas, given the fact that Russia has been the EU's primary exporter since the collapse of the Soviet Union in 1991. By February 2023 almost all EU member states had imposed complete embargoes on the importation of Russian coal, crude oil, and oil products, whereas no consensus has thus far emerged at the EU level on the continuation of Russian gas exports.

Despite the absence of a formal embargo on Russian natural gas, exports have drastically dropped since 2022, yet this does not necessarily entail that the EU will be able to achieve the goal of zero Russian gas exports by 2027, as is declared in its RepowerEU strategy. Through 2022, the EU has managed to cope with the loss of Russian gas exports by massively importing US LNG and, to a secondary extent, Norwegian pipeline gas. These exports though were contracted at a considerable premium and on a short-term basis. Most EU states have not managed to replace Gazprom's long-term contracts with alternative gas imports that would be available at competitive prices and on a long-term basis.

Herein lies an opportunity for the Republic of Cyprus (RoC), since the natural gas reserves discovered its Exclusive Economic Zone have the potential to offer a partial long-term alternative to the EU's dependency on Russia, but the window for the monetisation of these reserves is rapidly closing. Alternative EastMed exporters have already started to export to the EU, as well as to the East Med region, as early as 2020, whereas the first Cypriot exports cannot realistically reach any market before 2027. Nicosia's current plan to build a pipeline to Egypt in order to autonomously monetise the Aphrodite field is unlikely to offer Cyprus an export gateway to EU markets by 2027 and may even result to the stranding of the asset.

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At the same time a string of smaller discoveries in the RoC's western offshore blocks that took place between 2019-2022 are still at a very early stage of their potential development process and, if they are not developed jointly, they are also likely to be stranded. If a joint monetisation plan is indeed developed, these fields, namely Glaukos, Cronos and Zeus, are likely to begin exporting their gas by 2030 or, most likely, even later.

Keywords: Russia, EU, Ukraine, Cyprus, Energy Security, Natural Gas, Egypt, Israel, Eastern Mediterranean

1. Introduction

Apart from Russia's role as the world's preeminent petroleum exporter since the early 2010s,[2] the ability of Russia, and, in particular, that of Gazprom to dominate European gas markets underpinned Moscow's claim as the energy export 'superpower' of the world during the first two decades of the 21st century.[3] Despite systematic attempts by the European Union to diversify its import dependency since at least 2010, Gazprom's grip over EU markets proved extraordinarily resilient as Russia tried to limit its own overdependence on European markets by expanding its LNG (Liquified Natural Gas) capacity and opening new pipeline export routes to China.

This paper will first analyse the Russian-EU natural gas interdependency before the second Russian invasion of Ukraine in 2022, in order to highlight the level of uneven interdependency between the two sides and the failure of common EU action to secure alternative import sources to Russian gas that was considered of low political risk by both its primary consumers, Germany, and Italy. This first section is important in order to highlight, not only the catastrophic effect the Russian invasion had on EU-Russian gas trade since 2022, which is analysed is section 3, but also to underline a) the cost and the difficulty of EU importers to substitute Russian gas, and b) the continued resilience of Russian gas exports, most of which are contracted on a long-term basis with strict 'take or pay' clauses that oblige the importing company to pay for up to 80% of the contracted gas volumes, even if it does not actually consume or import it.

[2] International Energy Agency (IEA), *Energy Fact Sheet: Why does Russian Oil and Gas Matter?,* 21/03/2022, available at https://www.iea.org/articles/energy-fact-sheet-why-does-russian-oil-and-gas-matter, accessed 25/02/2023.

[3] Rem Korteweg, *Energy as a Tool of Foreign Policy of Authoritarian States, in Particular Russia*, European Parliament, (Brussels: 2018), p.13.

Europeans cannot safely say that they have rid themselves from Russian gas imports unless and until they secure long-term supply contracts from alternative suppliers, such as the USA, Qatar, Norway, Algeria, and Azerbaijan. Short-term LNG supplies may not be available when needed again, especially if market conditions in non-European LNG markets make consumers in Asia more attractive from an exporter's point of view.

As analysed in section 3, the massive and massively expensive substitution of Russian gas from the above-mentioned sources has been achieved since February 2022, not only at a very high cost but also on a short-term basis, with the sole exception of a 9 bcma (billion cubic meters per annum) long-term contract signed in May 2022 between Italy's ENI and Algeria's Sonatrach, that is essentially an expansion of a pre-existing commercial agreement which dates back to 1983.[4]

In this context, as is detailed in sections 4-5, the RoC has an opportunity to be part of the EU's strategic long-term pivot away from Russian gas. This opportunity though will be lost if a series of significant obstacles and delays are not overcome, that would allow Cyprus to export gas to the EU by 2027. This paper will then conclude in section 6, by proposing significant policy changes to the current strategy, which could expedite the monetisation of Cypriot gas exports in time to help the EU to eliminate Russian gas imports by the end of this decade.

2. Unbalanced Interdependency: The Russian Gas Export Strategy and the EU until February 2022

During the last 20 years, Russia has consistently ranked as the world's largest exporter of natural gas.[5] *In the case of the EU, although Russian gas accounted consistently between 40%-50% of the Union's net gas imports between 2001-2021, the significance of the EU market for the Kremlin has been steadily declining during that same period*. In 2007, almost 15 years before the Russian-Ukrainian War of 2022, the EU was importing around 40% of its gas imports from Russia, that, at the time, represented approximately 24% of its final demand.[6]

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[4] (n.a.), Eni, Sonatrach sign deal to boost Algeria gas exports to Italy, *Reuters,* 25 May 2022, available at https://www.reuters.com/business/energy/eni-sonatrach-sign-deal-boost-algeria-gas-exports-italy-2022-05-26/, accessed 10/10/2023.

[5] *BP, BP Statistical Review of World Energy 2022*, (BP: 2022), p.34.

[6] European Commission, *Commission Staff Working Document Accompanying Document to the Proposal for a Regulation of the European Parliament and of the Council Concerning Measures to Safeguard Security of Gas Supply and Repealing Directive 2004/67/EC,* (Brussels: 16/07/2029), p.63, avail-

At the same time Russia was exporting 82% of its global gas exports to the EU, close to 155 bcma, while an additional 12% was also directed to other European destinations, including primarily Turkey, Ukraine, Belarus, Serbia and Switzerland. Russia's complete dependence on EU and European markets had remained effectively unchanged since the fall of the Soviet Union in 1991.[7]

By 2021, despite the Russian-Ukrainian gas crisis that completely halted Russian gas exports via Ukraine for almost three weeks in January 2009, and despite the Russian annexation of the Crimea in 2014, Russian exports in terms of absolute volumes remained surprisingly stable at 147 bcma, although they had expanded significantly in terms both of net imports and of final demand as a result of the collapse of domestic EU gas production and the failure of Europe's import diversification strategy.

At the same time the beginning of Russia's LNG exports in 2010[8] and its pipeline exports to China in 2020 had significantly diversified its export dependency on the EU markets and drastically curtailed its transit dependency on the Ukraine, which the Kremlin achieved through the active assistance of Germany (Nord Stream) and Turkey (Turkstream), that both considered Russian gas to be of no significant political risk other than the risk of transit via Ukraine. Berlin eliminated the Ukrainian transit risk by building, in 2011 and 2013 respectively, the first two lines of the Nord Stream pipeline system.[9] Ankara removed the possibility of losing access to its Russian gas imports through the construction of the two Turkstream lines in 2020 (Erdag, 2021, Mikulska, 2017, Franza, 2015).[10]

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able at https:/ /www.cep.eu/Analysen_KOM/KOM_2009_363_ Sicherheit_der_ Erdgasversorgung/ SEC_ 2009-978.p/df, (accessed 22/04/2023).

7 *BP Statistical Review of World Energy 2009*, (BP: 2009), p.30.

8 *BP Statistical Review of World Energy 2011*, (BP: 2011), p.28.

9 Lucas Edwards, 'Why Germany Has Learned the Wrong Lessons From History', *Foreign Policy,* available at https://foreignpolicy.com/2022/12/27/germany-russia-ukraine-war-scholz-zeitenwende-history-geopolitics/*,* 27/12/2022, (accessed 22/09/2023). Olga Bielkova, 'Nord Stream 2 will Test New German Government's European Solidarity', *Atlantic Council,* 30/11/2021. Andreas Heinrich, Herbert Pleines, 'Towards a Common European Energy Policy? Energy Security Debates in Poland and Germany; The Case of the Nord Stream Pipeline', in Ulrike Liebert, Anne Jenichen (eds.), *Europeanisation and Renationalisation*, (Verlag Barbara Budrich: 2019), pp.169-182.

10 Anna Mikulska, (2017): 'The Changing Geopolitics of Natural Gas in the Black Sea Region', *Foreign Policy Research Institute*, 11 July 2017, available at http://www.fpri.org/article/2017/05/changing-geopolitics-natural-gas-black-sea-region/ (accessed 23/09/2023). Luca Franza, *From South Stream to TurkStream,* The Netherlands Institute for International Relations, Clingendael International Energy Program, 2015, available at https://www.clingendaelenergy.com/inc/upload/files /CIEP_paper_2015-05_web_1.pdf, (accessed 21/09/2023), Erdag Ramazan, TurkStream as Russia's Last Step in Diversification, *Insight Turkey*, Vol. 23, No. 1 (Winter 2021), 205-226.

In 2021, Russia exported a total of 241.3 bcma, accounting for 19.76% of global natural gas exports, the third best performance in its history. Of these 241,3 bcma, 146.7 bcma, or 60.8%, headed to the EU, with the remaining 39.2% were directed to Turkey (11.51%), China (5.45%), Japan (3.68%), the Commonwealth of Independent States (CIS) countries (11.32%), and the rest of the world (7.24%). Of the abovementioned 146.7 bcma, which were absorbed by EU markets, 132 bcma were supplied to the EU via pipelines and 15.4 bcma via LNG.[11]

In 2021 Russian exports covered around 50% of EU imports, amounting to 40% of its final demand.[12] Russia's market export diversification went hand in hand with the limitation of its transit dependency on Ukraine, which Russia could not have achieved without the active support of both Germany and Turkey. Between 1992-2011 close to 100% of Russia's global gas exports was consumed within Europe, with around 80% of these exports transited through Ukraine. The sole exception was the commissioning, in 2003, of the 16 bcma capacity Blue Stream gas pipeline that directly connected Russia and Turkey across the seabed of the Black Sea. The operation of the Blue Stream pipeline, though, did not affect EU gas volumes since it was entirely dedicated to covering the needs of Turkey's domestic market.[13] The core of Russia's gas strategy after the annexation of Crimea, in 2014, can be summarised by (a) the acceleration of its diversification strategy in terms of accessing non-European markets -primarily in Asia- through the expansion of its LNG capacity and through the construction of pipelines to China such as the Power of Siberia line[14] and (b) eliminate its transit dependency on Ukraine in order to de-risk its access to its existing EU markets, primarily via Germany and secondarily via Turkey.[15]

Eliminating the Ukrainian transit risk for Russia would have been made possible only after the commissioning of the second Nord Stream pipeline system[16] that would have carried an additional 55 bcma to the EU via Germany, which was completed in

[11] BP Statistical Review of World Energy 2022, (BP: 2022), pp.36-37.

[12] European Commission, *REPowerEU: Joint European Action for more affordable, secure and sustainable energy*, (Brussels: 08/03/2022), p.1.

[13] https://www.gazprom.com/projects/blue-stream/, (accessed 23/5/2023)

[14] James Henderson, Tatiana Mitrova, *The Political and Commercial Dynamics of Russia's Gas Export Strategy*, Oxford Institute for Energy Studies, (OIES: 2015).

[15] Tatiana Mitrova, Vyacheslav Kulagin, Anna Galkina, 'The transformation of Russia's Gas Export Policy in Europe', *Proceedings of the Institution of Civil Engineers - Energy* 168 (2015), pp. 30-40.

[16] Morena Skalamera, Andreas Goldthau, Russia: Playing Hardball or Bidding Farewell to Europe? Debunking the Myths of Eurasia's New Geopolitics of Gas, Belfer Center for Science and International Affairs, (Harvard University: 2016).

September 2021 but never operated.[17] Despite the non-commissioning of the Nord Stream 2 system, by the time Russian tanks rolled into Ukraine, in February 2022, Russia had nearly completely bypassed Ukraine on its way to EU markets, while completely securing its Turkish-bound exports from the potential cutoff of the Ukrainian route.

In 2011 the first pipeline of the Nord Stream 1 system of pipelines removed from Kiev's control 27,5 bcma, the near totality of Germany's Russian imports. By 2013 Ukraine's German bypass had doubled to 55 bcma. In 2020 the Turkstream pipeline system,[18] added 31 bcma to the export routes bypassing Ukraine. As a result of these bypass pipelines, Russian gas exports to the EU that still used the Ukrainian transit system were reduced to around 26.7% at the end of 2021, compared to more than 80% in 2011. The construction of these bypass pipelines, as well as the opening to China via the commissioning of the Power of Siberia 1 pipeline in 2021, which will transport up to 48 bcma to China by the end of 2026,[19] were state-run and state-financed strategic undertakings that aspired to consolidate not only Russia's geopolitical clout vis-à-vis Ukraine and the EU, but to also secure the longevity of the crucial economic 'dividends' the Russian government collected through the international competitiveness of its hydrocarbons industry.

According to data from the Russian Ministry of Finance, the primarily state-owned Russian oil and gas industry generated -between 2011-2020- around 43% of the country's budgetary revenues, with oil and oil products exports accounting for 80%-85% of the income the Russian state collected from the taxation of its oil and gas industry[20] In 2021, thanks to high oil and gas prices, Russian state revenues expanded by 51,3% compared to the previous year, estimated at $120 billion. The total value of these exports was estimated at close to ¼ of a trillion USD, with oil and oil products representing 77% of these volumes and natural gas the remaining 23%, valued at $55 billion in 2021 prices.

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[17] Daniel Cochis, Nord Stream 2 is Complete - What Now? *Heritage Foundation,* 10/01/2022, available at https://www.heritage.org/europe/report/nord-stream-2-complete-what-now, (accessed 1/3/2023).

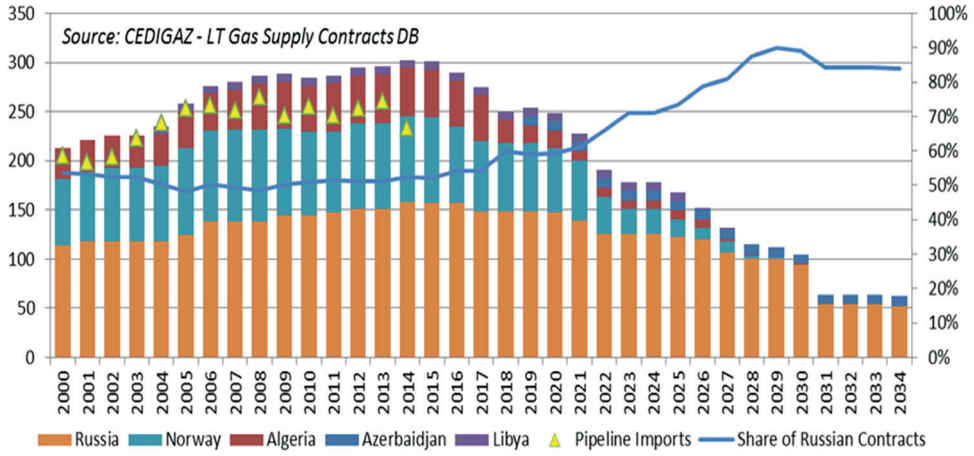
[18] Theodoros Tsakiris, 'The Energy Parameter of the Russian-Ukrainian-EU Impasse: Dependencies, Sanctions and the rise of Turkish Stream', *Journal of Southeast European and Black Sea Studies,* Vol.15, No.2, (September 2015), 203-219.

[19] https://www.reuters.com/world/asia-pacific/exclusive-russia-china-agree-30-year-gas-deal-using-new-pipeline-source-2022-02-04/, (accessed 23/5/2023).

[20] Ministry of Finance of the Russin Federation, available at https://minfin.gov.ru/ru/statistics/fedbud/execute/?id_65=80041-ezhegodnaya_informatsiya _ob_ispolnenii_federalnogo _byudzhetadanny-e_s_1_yanvarya_2006_g (πρόσβαση 01/03/2023).

In 2021 the European Commission estimated Russian exports to EU-27 Member States (MS) at 155 BCM, including both pipeline (140 BCM) and LNG (15 bcm), of which around 120 BCM were linked to Take or Pay clauses estimated as high as 75%-80% of the contracted volume. This means that, even if an importer chose to not honour a theoretical 10 bm contract which has an 80% Take-or-Pay clause, he would still have to pay for 8 bcm even if he consumed 1 bcm that particular year. These TPA clauses provide Russia with a long-term financial leverage over European importers that could extend to 2034, according to the following graph from the databank of Cedigaz, Europe's oldest gas companies association.

Graph 1: LTC in EU Gas Supply)[21]



Even if EU gas consumers diversify away from Russian physical supplies, the financial burden of the LTC contracts will remain, possibly even for years after the actual physical deliveries cease, unless of course some sort of a compromise is reached regarding the unfreezing of Russian state assets held by G7 governments, that are valued at approximately $300 billion. The contracted volumes of Gazprom's Long-Term Contracts are estimated by 2022 to be around 100 bcma, or 2/3 of Russia's pre-2022 exports, and are expected to drop to below 50 bcma between 2031-2035.

As is indicated above, the bulk of Russian gas exports were not circumstantial and were not traded on a short-term monthly basis. Although, as will be analysed in the next section, the EU did find extremely costly alternatives to the loss of Russian gas

[21] https://www.cedigaz.org/wp-content/uploads/Evolution-of-EU28-LT-import-contracts.png, (accessed 24/5/2023)

during 2022, these volumes were short-term LNG imports that will not be necessarily available whenever they are needed again, since they are not 'booked' on a long-term basis that is linked to a relatively predictable and stable pricing mechanism.

The pricing stability and predictability of these LTC (Long Term Contracts) that usually benefit the importer, are counter-balanced by a TPA (Take of Pay) Clause that benefits the exporter. If the EU fails to replace existing Russian LTC will alternative LTC supplies, in either LNG or pipeline form, European gas prices throughout the rest of the decade will become more volatile and more costly, while supplies will become more unpredictable, potentially destabilising supply security.[22] As Gergely Molnar, a senior analyst at the International Energy Agency (IEA) notes: 'Through the past two decades, long-term contracts, together with domestic production, met some 80-90 percent of EU gas demand. Non-observance of Russian-piped gas contracts steeply increased the European Union's reliance on spot procurements, rising from just 20 percent in 2021 to over 50 percent in 2023. The share of spot volumes is expected to increase to more than 70 percent by 2030. This will increase Europe's exposure to more volatile spot markets over the medium term… A higher share of long-term contracts could provide greater price and supply stability'.[23] As is argued in parts 4 and 5 of this paper, Cypriot gas can become part of the EU's future long-term gas supply portfolio, provided it successfully monetises the Aphrodite field by 2027.

3. Structural Change: The Impact of the Russian-Ukrainian War on the Russian-EU Gas Trade

According to the EU's RepowerEU Strategy document, in 2021 the European Commission estimated Russian exports to the EU at approximately 155 bcma, of which 15 bcma were exported in the form of LNG.[24] The main reason behind the drastic reduction of Russian gas exports to the EU throughout 2022 was caused neither by an extensive Russian embargo on its own clients nor by a successful long-term substitution of EU imports by alternative suppliers -although this was achieved at extremely high costs through the redirection of primarily Asia-bound US LNG volumes.

[22] Zlata Sergeeva, *The Ban on Long-Term Natural Gas Contracts for the European Union: A Double-Edged Sword?* King Abdullah Petroleum Studies and Research Center, March 2023, DOI: 10.30573/KS--2022-DP15

[23] Gergely Molnar, 'A Structural Transformation', *World Energy,* Issue 57 (July 2023), 18-23.

[24] European Commission, *REPowerEU: Joint European Action for More Affordable, Secure and Sustainable Energy*, (EC: 08/03/2022), p.1.

The main reason for the loss of the bulk of Russian gas exports, was the sabotage which incapacitated the Nord Stream pipeline, which is attributed to a Ukrainian paramilitary group.[25] The sabotage was initially attributed to Russia, but responsibility for the worst attack on a European critical infrastructure since the end of WWII is currently being assigned, by most European intelligence and investigation agencies, to an obscure Ukrainian paramilitary group without proof of any formal ties to Kiev. [26]

Since its invasion of Ukraine, Russia had deliberately cut its exports in violation of its own Long-Term Contracts (LTC), to only three member states, Poland, Bulgaria, and Finland, respectively in April and May 2022, claiming that these three countries did not comply with Russian Presidential Decree 172 that demanded payment for the delivery of gas supplies in roubles. With the exception of Finland, where Russia's reaction was motivated by Helsinki's petition to join NATO, in both the cases of Poland and Bulgaria Gazprom's LTC were set to expire at the end of 2022 and both governments had publicly made clear that it was not their intention to renew them *before* the Russian embargo has taken effect, on 27 April 2022.

The combined loss of Russian exports in these three cases corresponded to around 10% of Russia's 2021 pipe gas and LNG exports to the European Union.[27] The fundamental change in the balance of Russian-European natural gas trade resulted from Russia's decision to limit -for ostensibly technical reasons- , during July 2022, and eventually completely shut down as of 1 September 2022, the flow of gas via its main export pipeline to Germany and Central Europe. Nord Stream 1, that has a nameplate throughput capacity of 55 bcm/y (but can be extended up to 65 bcm/y), constituted the main artery securing Germany's gas imports from Gazprom.

In 2021 Russian gas exports amounted to around 1/3 of Germany's annual gas consumption of 142 bcm, according to data from the German foreign trade statistics

[25] Phillip Oltermann, Lorenzo Tondo, 'Officials Believe Pro-Ukraine Group May Have Sabotaged Nord Stream', *The Guardian,* 08/03/2023, available at https://www.theguardian.com/ world/2023/mar/07/ officials-believe-pro-ukraine-group-sabotage-nord-stream-pipelines

[26] Adam Entous, Julian E. Barnes, Adam Goldman, 'Intelligence Suggests Pro-Ukrainian Group Sabotaged Pipelines, U.S. Officials Say', *The New York Times,* 07/03/2023, available at *https://www.nytimes.com/2023/03/07/us/politics/nord-stream-pipeline-sabotage-ukraine.html.*

[27] Gazprom interrupted supplies to Bulgaria and Poland on 27 April 2022. Zosia Wanat, 'Poland and Bulgaria Start Life with No Russian Gas:, *Politico,* 27/04/2022, available at https://www.politico.eu/article/poland-bulgaria-life-no-russia-gas/, (accessed 30/05/2023).

office BAFA, equaling approximately 52% of all German gas imports. [28] Russia had been reducing gas supplies through Nord Stream 1 for a number of months. In June 2022, it cut deliveries through the pipeline by 75% -from 170m cubic metres of gas a day to roughly around 60% of its technical capacity. In July 2022, Russia shut it down for ten days, citing the need for maintenance. When it reopened, the flow was halved to around 80% of its normal capacity.

In late August 2022, it shut down Nord Stream 1 entirely, blaming problems with equipment, in particular delays in the service of the pipeline's compressor stations. The pipeline has not been open since then. Despite the fact that typically Gazprom shut down the Nord Stream 1 pipeline system for reasons of operational security after a purported oil leak was discovered in one of the serviced compressors,[29] the non-interruption of supply in Turkstream, which went through a similar process of maintenance in July 2022, indicates, but does not legally corroborate, a political motivation behind the Kremlin's decision to effectively stop all exports to its largest and most lucrative gas export market anywhere in the world up to that point.

From a legal point of view, the Russian ToP (Take or Pay) clauses remain relatively strong with regards to Gazprom's German contracts that could be reactivated after the leaks in NS1 are repaired and if these repairs are technically possible. From a political point of view, though, keeping Nord Stream shut effectively shields Gazprom's German clients from any ToP claims on behalf of the Russian gas company. This facilitated German diversification away from Gazprom, but that diversification for Europe's largest gas consumer, and for the EU as a whole, was neither easy nor cheap.

More importantly that diversification was temporary in nature, in the sense that it was made possible as a result of extraordinarily low Chinese demand and extraordinarily high EU gas prices that motivated the largest redirection of gas exports ever recorded. Between 2021-2022, EU lost access to around 80 bcm of Russian gas, with Russian exports accounting for merely 20% of EU gas demand in 2022, compared to 40% in 2021. Collective EU gas demand reduction measures reduced overall demand

[28] Vera Eckert, Kate Abnett, 'How Dependent is Germany on Russian Gas?', *Reuters,* 08/03/2022, available at https://www.reuters.com/business/energy/how-dependent-is-germany-russian-gas-2022-03-08/ (accessed 30/5/23).

[29] Jan Cienski, 'Putin Shuts off EU's Nord Stream Gas Supply. Gazprom Says Equipment Has to be Taken Offline until it is Repaired', *Politico*, 02/09/2022, available at https://www.politico.eu/article/gazprom-announces-nord-stream-stoppage/, (accessed 30/05/2022).

from 380 to 370 bcm, and the remaining 20 bcm came primarily from Norway and, to a secondary degree, Algeria.[30]

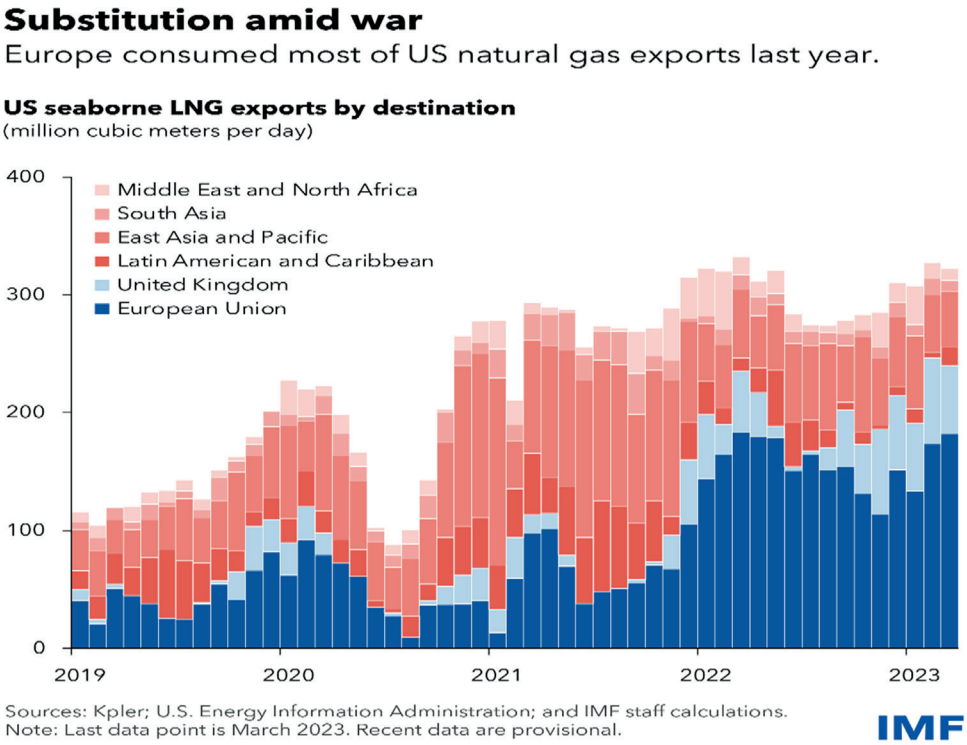
US LNG exports to Europe expanded, according to the Energy Information Administration of the US Department of Energy, by 141% year-on-year in 2022, making the US the EU's third second largest exporter of natural gas after Norway and Russia. More than 65% of global US LNG exports were directed to the Europe OCED or the equivalent of 72bcm if one includes US exports to the UK and Turkey.[31] Neither Qatar nor Australia diverted any of their gas exports from Asia to Europe during 2022. According to Eurostat, in 2021 LNG exports to the EU recorded the highest volume, reaching more than 22 bcma, at an estimated cost of €12 billion, and during that same year EU markets absorbed 23% of total US LNG exports.[32] Data compiled by the International Monetary Fund indicate that, from March to December 2022, EU/European market destinations, primarily Germany and the UK, absorbed more than 2/3 of global US LNG exports as indicated by the following graph.

[30] Lapo Pistelli, 'The Trade-Offs of the Energy Trilemma', *World Energy,* Issue 57 (July 2023), 12-17, 14-15.

[31] US Department of Energy, Energy Information Administration, 'Europe was the Main Destination for US LNG Exports in 2022', 22/03/2023, available at https://www.eia.gov/todayinenergy/detail.php?id=55920#, (accessed 23/05/2023). Energy Institute, *Statistical Review of World Energy 2023*, (Energy Institute: London 28/06/2023).

[32] European Commission, *EU-US LNG Trade*, (Brussels: February 2022), available at https://energy.ec.europa.eu/system/files/2022-02/EU-US_LNG%20trade_2022.pdf.

Graph 2: US Global LNG Exports by Final Destination [33]



By the end of 2022, the value of EU-bound US LNG exports is estimated to have surpassed $40 billion, nearly four times the value of 2021. Most of these US exports were the result of short-term redirection of preexisting U.S. Long-Term Contracts that were primarily bound for Asian markets and found their way to the EU as a result of unprecedently low Chinese demand and unprecedently high EU gas prices that reached an all-time peak of approximately €340/MWh on 26 August 2022, a price tantamount to approximately $580/barrel.[34] It is indicative of the market panic conditions in the EU gas market that the main index of EU gas prices, the Dutch-

[33] Rachel Brasier, Andrea Pescatori, Martin Stuermer, 'How Natural Gas Market Integration Can Help Increase Energy Security', *International Monetary Fund*, (Washington DC: 23/05/2023) available at https://www.imf.org/en/Blogs/Articles/2023/05/23/how-natural-gas-market-integration-can-help-increase-energy-security (accessed 29/09/2023).

[34] David Sheppard, 'European Gas Traders Dare to Dream Prices Have Peaked', *Financial Times,* 16/09/2022.

based TTF,[35] traded on average throughout 2022 at a premium of $6/mbtu (million british thermal Unit), an unprecedented increase compared to 2021, when the average Asian benchmark gas price index, the JKM (Japan Korea Marker), traded at 18,6$/Mbtu or $2,5/mbtu higher than the TTF[36]. If China had not been under severe economic restrictions as a result of the draconian anti-COVID measures introduced by its government throughout 2022, these US volumes would not have been available,[37] and even if some of these volumes had become available, they would have been available at even more exorbitantly high prices.[38] Chinese LNG imports in 2022 fell by 20%, a reduction of 22 bcm[39] that accounted for half of total EU LNG imports during that same year. As Molnar notes, 'the unprecedented 20% drop in Chinese LNG imports was a key factor in enabling more LNG shipments to reach the European markets'.[40]

Given the fact that the share of Chinese LTC will amount to around 25% of the entire future LNG market by 2030 (from just 12% in 2021), next time the Europeans need spot LNG supplies in order to reduce their remaining Russian imports, these supplies may simply not be available. The fact that almost 50% of all EU gas supply contracts, compared to 20% in 2021, were spot market transactions valid -in most cases- for no longer than 30 days, does not augur well for Europe's price stability and supply security, a recent study by the European Central Bank concluded.[41]

The gap created by the disappearance of more than 80 bcma of Russian gas from EU markets in 2022, in combination with the RepowerEU objective to eliminate the remaining 40-50bcm of Russian gas still flowing to the EU in 2023, result in an urgent need to replace Russian exports through -inter alia- new Long-Term Contracts, in order to decrease pricing volatility and supply unpredictability. As we will examine in chapter 4, the Republic of Cyprus has the reserve basis to partially cover that

[35] Molnar, (no24) p.22..

[36] BP (no 11, p.33).

[37] Gabriel Di Bella, Mark Flanagan, Karim Foda, Svitlana Maslova, Alex Pienkowski, Martin Stuermer and Frederik Toscani, *Natural Gas in Europe: The Potential Impact of Disruptions to Supply,* IMF Working Paper. 22/145, (July 2022), p.16.

[38] Sofia Nicolai, 'The Limits of Using US LNG to Save the EU', *European Union Institute*, 01/10/2022, available at https://fsr.eui.eu/the-limits-of-us-lng-to-save-the-eu-this-winter-not-enough-infras tructures-and-a-tricky-global-lng-price/ (accessed 28/05/20223)

[39] BP (no 11, p. 34)

[40] Molnar (no 23, p. 22).

[41] Jakob Feveile Adolfsen, Marie-Sophie Lappe and Ana-Simona Manu, "Global risks to the EU natural gas market", *ECB Economic Bulletin*, January 2023, https://www.ecb.europa.eu/pub/economic-bulletin/focus/2023/html/ ecb. Ebbox 202301 _01~ 6395aa7fc0.en.html, (accessed 22/05/2023)

EU need, provided it overcomes a series of obstacles that have been compounded by almost a decade of delays in the monetisation of its natural gas assets, many of which face the real danger of becoming stranded. Better placed suppliers within the East Med region, such as Israel and particularly Egypt, who already exports significant LNG volumes (11,2 bcma in 2022 out of a combined liquefaction capacity of 17 bcma), to Europe,[42] in combination with the additional expansion in US and Qatari LNG supplies by 2027, are most likely to eclipse any potential market space for future Cypriot gas exports to the EU if these exports arrive two or three years after 2027. According to the US Energy Information Administration, by the end of 2024, U.S. LNG nominal liquefaction capacity will increase to 14.1 Billion cubic feet per day (Bcf/d) and peak capacity to 17.0 Bcf/d across the nine U.S. LNG export facilities, with three new export terminals being commissioned by December 2024.[43] This corresponds to an increase of 33% in terms of nominal capacity, which corresponds to approximately 33 bcma of additional exports that could be locked into LTC, compared to a total US LNG exports of 104,7 bcm in 2022 (Energy Institute, 2023, 39). Additional expansion will further increase the total US liquefaction capacity to 158,4 Million Tonnes per Annum (MTPA) by December 2027, or 221 bcm, almost 116 bcm more than 2022 (Borges, 2023).[44]

The USA is not alone in this rush for global LNG liquefaction expansion. Qatar, which has almost twice as much confirmed natural gas reserves than the USA and was the world's leading LNG exporter in 2022 with total exports of 114 bcm, also has very ambitious plans. By the end of 2027, Doha plans to expand Qatar's LNG production by about 64% to 126 mtpa from about 77 mtpa currently, through the North Field East and the North Field South expansions. This will add around 68bcm to the global markets.[45] By 2027 Qatar and USA alone will add around 184 bcma of LNG exports above and beyond their current capacities. Even if there is no other LNG liquefaction expansion anywhere else in the world, which is impossible, US and

[42] Pierpaolo Raimondi, "Mare Nostrum", *World Energy,* Issue 57, (July 2023), 56-61

[43] US Energy Information Administration, U.S. LNG exports will increase next year as two export terminals come online, 13/07/2023, https://www.eia.gov/outlooks/steo/report/ BTL/2023/07-LNG/article.php, (accessed 5/10/23)

[44] Molly Borges, "US to lead global lLNG liquefaction capacity additions through 2027", *GasWorld,* 15/08/2023, https://www.gasworld.com/story/us-to-lead-global-lng-liquefaction-capacity-additions-through-2027/, (accessed 6/10/23).

[45] Faiza Rizvi, "Inside Qatar's multi-billion LNG expansion", *Oil & Gas Middle East,* 03/07/2023, (accessed 04/10/2023), https://www.oilandgasmiddleeast.com/news/inside-qatars-multi-billion-lng-expansion

Qatari volumes are more than enough to meet the RepowerEU objective, even if only half of these volumes are eventually destined for EU markets in the form of LTC commitments. Can Cypriot gas compete with this expected expansion if it does not arrive at EU markets by 2027? If the current deadlock continues, the answer is simply no.

4. Evaluating the Reserves of the Cyprus EEZ from the Aphrodite to the Zeus Discoveries (2011-2022)

The attempts of the Republic of Cyprus to explore and exploit its hydrocarbon potential goes back to the first exploratory drilling (A-1) on the Aphrodite prospect, which was completed in December 2011 and resulted in an estimate of 7-10 TCF (Trillion Cubic Feet) of *in situ* reserves. The success of the initial drilling followed three years of unprecedented discoveries for Noble, Delek, and Avner in the Israeli Exclusive Economic Zone, that included Tamar and Leviathan, respectively, in January 2009 and December 2010. The initial enthusiasm of 2011 was somewhat dampened by the results of Aphrodite's first appraisal drilling, that indicated the existence of a smaller potential reserve estimated between 5 and 8 TCF. Despite the lower reserve estimate, the field's operator, Noble Energy, declared Aphrodite a commercially exploitable reserve in 2014 and announced a reserve estimate of 4,4 TCF.[46]

Between 2013 and until 2019, a series of political and geopolitical developments, including a string, between 2014-2015, of three unsuccessful exploration wells by ENI in Block 9 and by Total in Block 11, threatened to terminate the Cypriot hydrocarbons exploration program. In December 2014, the hopes of a major discovery on the Onasagoras prospect in Block 9 were dashed when the ENI/Kogas exploration came up with a dry hole, in late January 2015 Total announced that it had not found enough evidence to support the cost of drilling an exploratory well in Block 10, where Exxon would discover Glaukos four years later. Moreover, ENI's second drilling on Block 9, the Amathousa well, also ended in failure in March 2015, leading to the effective withdrawal of ENI from the Cypriot EEZ until February 2018.[47]

ENI's withdrawal stopped all exploratory activities in the Cypriot EEZ and coincided with the election of Mr. Akinci in the leadership of the Turkish Cypriot community and the restart of the intercommunal talks, in April 2015, but there was never a direct causal link established between the two developments, although no timetable

[46] Sharon Wrobel, "Israel's NewMed and partners to connect the Aphrodite gas field off Cyprus to Egypt? *The Times of Israel,* (Jerusalem 31/05/2023).

[47] Theodoros Tsakiris, "Cyprus's natural gas strategy: Geopolitical and economic preconditions" 2017, 28 (1), *Mediterranean Quarterly*, 29-57

for the return of ENI was announced for Block 9, which has yet to be drilled even after eight years. When ENI did attempt to drill on Block 3, in February 2018, the Italian major oil company and Nicosia were entirely unprepared for the entirely predictable Turkish reaction that led to the cancellation of the so-called 'Jellyfish' well and the essential freezing of all exploration activities in the northern part of the demarcated Cyprus EEZ to this day.[48] Although the 2018 incident hindered further upstream activities in the northern blocks of the demarcated Cypriot EEZ, it did not paralyse exploration activities further south, where the second major Cypriot gas field, Glaukos, was eventually discovered in March 2019.

Had it not been for the discovery of Zohr, in August 2015, Cyprus' offshore exploration efforts might have ended in abject failure regardless of what Turkey was able or prepared to do to stop it. By the admission of former Cypriot Energy Minister George Lakkotrypis,[49] it was Zohr's discovery that re-galvanised the interest of the International Oil Companies (IOC) in the Cypriot EEZ. Total remained in Block 11 and drilled another unsuccessful exploratory well in the Onisiforos target, in September 2017. The results were disappointing in that the 11,2 billion cubic meters (bcm) discovery could not be autonomously developed, but they confirmed the existence of hydrocarbon reserves to the north of the Zohr discovery. In April 2017, during its third licensing round, the RoC tendered Block 8 to ENI, Block 6 to ENI/Total and Block 10 to a consortium made up from Exxon and Qatar Petroleum where Exxon is the operator controlling 60% of the consortium's shares.

Despite Turkey's claims that the northern parts of Blocks 6 and 7 'belong' to its continental shelf and its warnings to the license holders that it would stop their drillings by force (a threat it eventually carried out against ENI in August 2018), ENI and Total drilled on the southern part of Block 6 in January 2018. Their drilling led to the discovery of the Calypso prospect, which is believed to be extending to Block 7. There has been no official announcements regarding the size of Calypso, but it is believed to be -if confined to Block 6- a non-commercially exploitable reserve.

In December 2018, exploration rights over Block 7 were awarded to the Total/ENI consortium, opening the way for a new drilling campaign originally scheduled for 2020, that could have ascertained the size and potential extractability of the Ca-

[48] Marika Karagianni & Andreas Stergiou, *Does Energy Cause Ethnic War? East Mediterranean and Caspian Sea Natural Gas and Regional Conflicts*, (Cambridge:Cambridge Scholars Publishing: 2019,

[49] Michalis Kambas, "Cyprus gas search spurred on by Egypt find, says Cypriot minister", Reuters, 12/05/2017, https://www.reuters.com/article/us-cyprus-energy-minister-idUSKBN1881XC , (accessed 02/06/2023)

lypso field, had it not been postponed due to the delays imposed on all economic activities by the COVID-19 pandemic. As of late 2023, no drilling in Block 7 has taken place or is scheduled to take place, a considerably negative development.

In November 2018, Exxon commenced drilling operations on its first of three targets in Block 10. Its first well, in Delphini, completed in January 2019, was dry, but the second target (Glaukos) resulted in the RoC's second major discovery at a water depth of 2km (2.063m). Glaukos' initial reserves estimate is between 5-8 TCF (or 142-227 billion cubic meters) of *in situ* reserves. The Glaukos discovery is quite significant, not only because it proves the hypothesis that Zhor-type fields exist inside the Cypriot EEZ, thereby providing impetus for further exploration, particularly in Blocks 6, 7, 8, 9 and 10, but also because it can more than double the net export capacity of the RoC, provided the appraisal well confirms even the lowest range estimate of circa 5 TCF.[50]

Although the results of the appraisal well Exxon completed in Glaukos, back in February 2022, have not been announced, thereby feeding speculation that the reserve may even be smaller than 5 TCF ,[51] the discovery of Glaukos did incentivise additional exploration that resulted in new discoveries which expanded the RoC's potential reserves basis. In August 2022, ENI/Total announced the discovery of a small 2,5 TCF prospective field in Block 6 called Cronos-1 (Saturn), which was followed, in December of that same year, by another discovery in the Zeus-1 location again in Block 6, that is estimated to contain 2-3 TCF.

These discoveries confirmed existence of a system of small deposits around the seamount of Eratosthenes, which are similar in geological origin to Zor, but fall far short of the enormous size (circa 30 TCF in situ) of the Egyptian deposit. These western blocks' discoveries may contain anywhere between 9,5-10,5 TCF, or smaller if Glaukos is confirmed as a 5 TCF reserves .[52] If the Aphrodite field is indeed confirmed as a 4,4 TCF and Glaukos at 5 TCF, then the combined reserves of the Cypriot EEZ may rise to around 13.9-14,9 TCF, or 393-422 billion cubic meters, located in Block 6, 10 and 12 as indicated by the map below.

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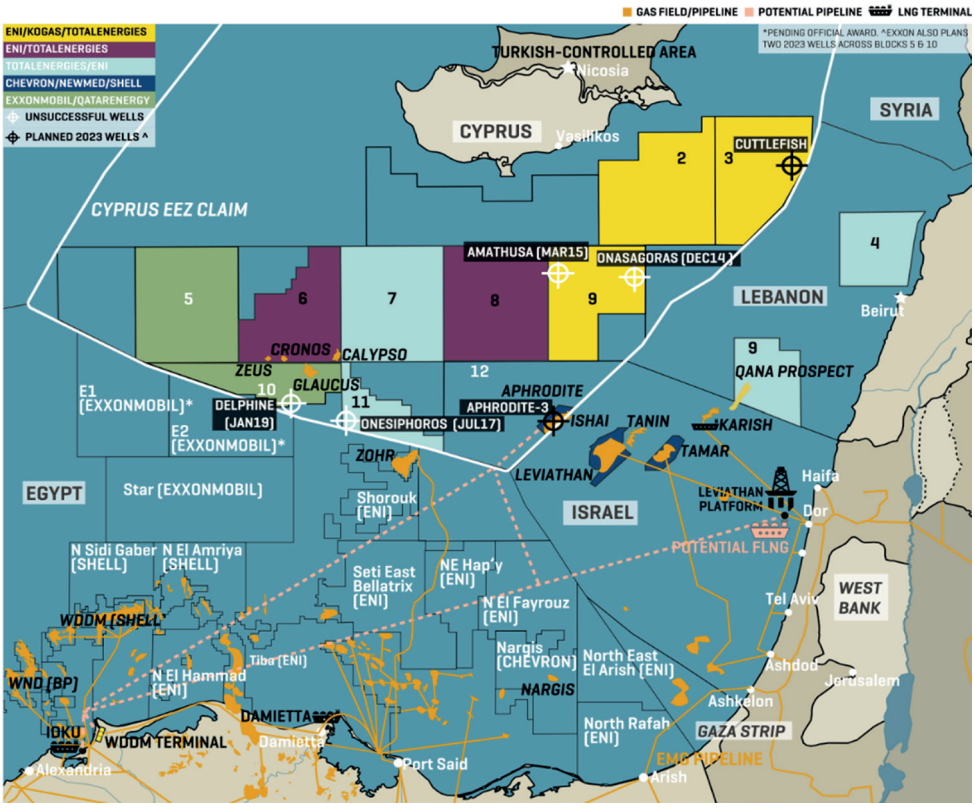
[50] Simon Henderson, "Cyprus Gas Discovery Could Be an East Mediterranean Game-Changer", *Washington Institute for Near Eastern Policy*, 01/03/2019, https://www.washingtoninstitute.org/policy-analysis/cyprus-gas-discovery-could-be-east-medi terranean-game-changer (accessed 3/06/2023)

[51] Constantinos Tsindas, "High quality natural gas in Glaucus-2 but doubts over quantity", Cyprus Mail, (Nicosia 21 March 2022) https://cyprus-mail.com/2022/03/21/evaluation-drilling-completed-at-glafcos-2-high-quality-natural-gas-found/ , (accessed 03/06/2023)

[52] Theodoros Tsakiris, "What does the "Zeus" discovery signify for the dynamics of energy in Southeastern Mediterranean", *Kathimerini, (*Athens*,* 23 December 2022).

Map 1: Active Exploration Licenses and Discoveries in the Cypriot EEZ [53]



5. Monetisation Deadlock: Persistent Development Uncertainties are 'Impeding' Gas Exports

The abovementioned 393-422 billion cubic meters could theoretically cover almost the entire gas demand of the European Union for more than a year, which in 2022 averaged 343 bcm, but it, too, will remain untapped at the bottom of the sea unless the new government of the RoC sworn into office in March 2023 resolves a series of inherited uncertainties. These uncertainties are compounded by the fact that the different discoveries, none of which is still fully ascertained, are scattered across three offshore blocks (Blocks 12, 10, and 6), that are too far apart to be jointly monetised.

[53] Peter Stevenson, "Cyprus Gas Ambitions: From Dreams To Reality In 2023?", *Middle East Economic Survey,* (Nicosia 27 January 2023), (accessed 03/06/2023) https://www.mees.com/2023/1/27/oil-gas/cyprus-gas-ambitions-from-dreams-to-reality-in-2023/f0154a20-9e43-11ed-b50a-fbcb54be70bc

An additional factor of complexity is that the four (Aphrodite, Glaukos, Zeus and Cronos) principal discoveries -since the results of the Calypso drilling have never been announced- are managed by three different consortia, two of which would have to work together to develop the discoveries by taking advantage of their close geographical proximity.

This is the case for ExxonMobil & Qatar Petroleum (QP) regarding Glaukos and the Total/ENI consortium as far as the smaller Block 6 discoveries are concerned. A joint monetisation of these western EEZ discoveries is possible, with an obvious monetisation option being an export by pipeline to Egypt, but it might take years before further appraisal drilling takes place in the existing fields or before Exxon/QP and Total/ENI drill in the heretofore unexplored offshore blocks 5 and 7 that are adjacent to Blocks 6 and 10 where the aforementioned discoveries were made. Block 7 was tendered to ENI/Total in September 2019, while Exxon/QP acquired their exploration license of Block 5 in December 2021. The Western Blocks discoveries are at best three years before the approval of a Field Development Plan, but is makes sense to jointly produce and monetise them, either by building a pipeline to Egypt or pool them together to establish a reserves basis sufficient enough to justify a floating LNG facility.

In either case, since no FID will be taken for any of these fields within 2023 and no FID will be taken unless and until all four relevant IOCs (Exxon, Qatar Petroleum, Total and ENI), agree to a common monetisation plan, production is highly unlikely to begin by the end of 2027. This essentially means that it is only through the monetisation of the Aphrodite field that the RoC can contribute to the achievement of the EU's RepowerEU strategy. Unfortunately for the RoC, its oldest and most extensively appraised discovery for which Nicosia already approved an FDP in November 2019, is still nowhere near the beginning of its production. The current Cypriot export strategy is centered on the exportation of Aphrodite's gas to Egypt via an underwater pipeline. Yet the path of Aphrodite to Egypt is not paved with roses, but rather with thorns. Despite the fact it's been almost four years since the FDP's approval, progress on the field's development remains frozen and continues to be plagued by several uncertainties that may further delay its monetisation or even render the field stranded for the following five reasons:

(i) A final *proven* reserve estimate for Aphrodite is still not available. Although the second appraisal well was spudded in May 2023, with the results expected by late July 2023, it is important to note that the final appreciation of Aphrodite's 1P reserves will also determine its eventual exportation route. If the A-3 drill results in

a dry hole, then Aphrodite will not be developed via an independent export pipeline. It will either become a minor supplement to the development and exportation of Leviathan's second phase of production regardless of where the Leviathan Phase 2 gas eventually ends, or if it is not co-developed with Leviathan Phase 2, it would need to be pooled with other Israeli discoveries in order to become monetisable, such as the Karish North and Olympos fields developed by Energean in the Israeli EEZ.

(ii) Although both the Egyptian-Cypriot IGA of 2018 and Aphrodite's Field Development Plan approved in November 2019, recognise that Aphrodite's sole export destination is the Egyptian market, there has been no tangible progress on the signing of a gas and sales purchasing agreement (GSPA) between the developers of Aphrodite and any Egyptian importers or the companies controlling liquefaction capacity in Egypt's LNG facilities located in Idku and Damietta, despite the fact that Shell, which controls the largest liquefaction capacity in Idku, is also, since November 2015, the owner of a 35% stake in the Aphrodite field.

Without a GSPA it is impossible for the developers of Aphrodite to take the Final Investment Decision (FID) they are supposed to take, according to the terms of their exploitation license by November 2023 at the latest. If the 2023 deadline is missed due to the culpability of the license holder, then the government of Cyprus can theoretically even cancel the license and take over control of the development of the Aphrodite field. Given the complexity of Aphrodite's compartmentalised reservoirs, the government and the license holder jointly estimated that, from the date of the FID, one would still need at least 36-42 months for the first gas production, which may effectively move the expected beginning of monetisation to 2027 or even later.

In June 2020 Noble notified Nicosia that it was forced to 'readjust', in other words to delay, the timetable of operations in Cyprus as a result of the financial impact of the pandemic on its investment spending program. In less than a month after Noble's notification to Nicosia, Chevron announced an agreement with Noble to buy the Texas-based oil/gas producer in a $13 billion takeover that was completed in October 2020 .[54] The arrival of Chevron in the Eastern Mediterranean may eventually prove beneficial for the RoC, in the sense that Chevron has far larger financial capabilities than Noble and could easily pool Aphrodite with Leviathan Phase 2 together, but in the short-term it causes further delays in the development of the field, as Chevron

[54] Chevron, "chevron announces agreement to acquire noble energy", 20/07/2020, https://www.chevron.com/newsroom/2020/q2/chevron-acquires-noble-energy, (accessed 12/06/2023)

went through a protracted process of internal review regarding the monetisation of the various offshore assets it acquired from Noble in Cyprus and Israel .[55]

Nicosia cannot afford any more delays following the results of its A-3 well. If an FID is not taken by the license holders within 2023, then it may be left without any option other than taking back the field with due compensation to the existing license holders and start the planning of its development from scratch. The replacement of Chevron, though, is likely to be such a lengthy process, that it will result in Nicosia missing EU's 2027 deadline. Although the third well was completed in July 2023, there are still, as of early November 2023, no official results of the appraisal well.

(iii) Another complicating factor is the lack of any tangible progress regarding the maturity of the offshore pipeline connecting the Aphrodite field with the Egyptian market, which has been announced as the agreed-upon monetisation option between the RoC and the Chevron-led consortium. The fact that there is no clarity in who will be the Egyptian buyer, a domestic consumer or an external LNG importer, has created severe uncertainty over the net profit either Nicosia or the Aphrodite developers could expect, thereby further and seriously complicating any FID on the field's development, which-according to the approved FDP- should begin production within 2026.[56] Since domestic prices in the Egyptian market could be four to five times lower than international LNG prices, the margin of profit loss/gain is quite considerable. The paradox of Aphrodite's monetisation lies in the fact that the complexity and the delays on its development persist, despite the fact that the sellers of Aphrodite's gas (Chevron, Shell, Delek) and its buyers (Shell, Egas)[57] in Egypt, almost identify with the potential pipeline developers (Chevron, Shell, Delek, Egas).

(iv) An additional factor of uncertainty that compounds the field's stagnation is the lack of an agreement with Israel over the potential joint monetisation of the Aphrodite field, which geologically partially extends into the Israeli EEZ and is called Yishai. This, in turn, requires the prior signing of a Common Unitisation Agreement

[55] Joshua Krasna, "Chevron's Purchase of Noble Energy: Accelerating the Eastern Mediterranean's Gas Revolution?", *Moshe Dayan Center,* 07/09/2020, (accessed 12/06/2023, https://dayan.org/content/chevrons-purchase-noble-energy-accelerating-eastern-mediterraneans-gas-revolution.

[56] Offshore Energy, "Cyprus OKs Aphrodite development plan. Grants exploitation license", *Offshore Energy*, 7/11/2019, (accessed 07/06/2023), https://www.offshore-energy.biz/cyprus-oks-aphrodite-development-plan-grants-exploitation-license/

[57] El Beheira Natural Gas Liquefaction Company (EBNGL), a joint venture between Shell (35.5%), Petronas (35.5%), EGAS (12%), EGPC (12%), and Engie (now a subsidiary of Total, 5%), owns the first train of the Egyptian LNG. Whereas, the ownership of the second train is held by the Idku Natural Gas Liquefaction Company (INGL), which comprises Shell (38%), Petronas (38%), EGAS (12%), and EGPC (12%)..

with Tel Aviv, that is long overdue, with negotiations ongoing since 2012. Although there appears to be a significant level of confusion over the share of the Aphrodite field claimed by the Yishai developers (Israel Opportunity Company, Eden Energy and Nammax), most estimates put the share of the volume under dispute to less than 10% of the confirmed *in situ* reserve.[58]

The size of the disputed reserve volume may not justify the level of the delay created as a result of the disagreement on how to resolve the dispute that blocked all progress on the issue between 2012-2021. The Cypriot government may have underestimated the resolve of the Israeli side to support the claims of the Ishai consortium, given the Israeli-Lebanese contention over a disputed maritime zone of 854km2 between their respective EEZ, that remained unresolved until a compromise was reached as a result of American diplomatic arbitration, in October 2022.

In December 2019, Ehud Adiri, the Director General of the Israeli Energy Ministry, sent a stern warning to the Cypriot government, noting that 'the State of Israel has not relinquished its share of the Aphrodite-Yishai natural gas reservoir and has no intention of doing so', while emphasising that 'the development and exploitation of the Aphrodite-Yishai field by the licensees of both states must not commence prior to reaching an agreement between the governments of Israel and Cyprus'.[59] Adiri was clearly signaling that, if Israel appeared to be making concessions to Cyprus over the division of future profits from a cross-border gas discovery, this would have set a dangerous precedent for Israel if another cross-border field was discovered along its disputed maritime EEZ with Lebanon or the Palestinian Authority in Gaza.

Despite a bilateral agreement reached in March 2021 by the two energy ministries on a dispute resolution mechanism that has currently put the responsibility for resolving the impasse at the hands of the two governments (and not an independent arbitrator), and in spite of a positive momentum created in October 2022[60] as a result of the successful US arbitration of the Israeli - Lebanese maritime dispute, the issue remains unresolved. Reaching a compromise on Yishai is a precondition for the Aph-

[58] Financial Mirror, "Cyprus, Israel agree on formula to end Aphrodite dispute", Financial Mirror, (Nicosia 9 March 2021), (accessed 12/06/2023), https://www.financialmirror.com/2021/03/09/cyprus-israel-agree-on-formula-over-aphrodite-dispute/

[59] Steven Elliot, "Cyprus gas field project still on despite Israeli claim: minister", *S&P Global Platts*, 10/12/2019, https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/121019-cyprus-gas-field-project-still-on-despite-israeli-claim-minister, (accessed 12/06/2023)

[60] Danny Zaken, "Israel, Cyprus to resolve disagreement over maritime gas field", *Al-Monitor,* 04/10/2022, (accessed 12/06/2023), https://www.al-monitor.com/originals/2022/09/israel-cyprus-resolve-disagreement-over-maritime-gas-field

rodite developers' Final Investment Decision (FID). As of early November 2023, no such compromise agreement has been reached.

6. Breaking the Monetization Deadlock

Although Cyprus is well endowed from a resource/reserve perspective to make a major contribution to the EU's efforts to rid itself of Russian gas imports by 2027, it is not likely to be able to achieve that goal unless and until it successfully copes with the four abovementioned challenges within 2023 in order for the Aphrodite developers to take their Final Investment Decision by November 2023, as originally scheduled in the FDP Nicosia approved in November 2019. Given the fact that it needs at least three and a half years for Aphrodite to start producing, the first Cypriot gas exports from its most mature eastern field should materialize within the 3Q or 4Q of 2026, if an FID is taken within 2024.

The most important precondition, of course, for such a prospect to materialise is for Cyprus and the Aphrodite developers to secure a Long-Term GSPA (Gas Sales Purchasing Agreement) for the probably 7 bcma the field can produce *ad maxima*. Although some of that gas may end up going to the domestic Egyptian market, it is very important for Egypt to provide to both Cypriot and Israeli shippers direct access to its LNG export facilities. Otherwise, these exporters will essentially be selling not to European LNG markets but to the Egyptian markets, thereby freeing up Egyptian gas for liquefaction and exportation.

This is not a commercially sustainable strategy on the part of Israeli and Cypriot gas producers given the very high margins of profit international LNG markets would provide compared to the Egyptian domestic market. That market is essentially regulated by the Egyptian government, that imposes minimum price levels by decree.[61] Egypt currently enjoys an LNG export monopoly in the Eastern Mediterranean and it has used that monopoly to generate significant profits, with the value of Egyptian LNG exports expanding from $0,456 billion in 2020 to $3,96 billion in 2021[62] and over $8,4 billion in 2022.[63]

[61] (n.a.) "Prime Minister Issues Decree to Reset Natural Gas Selling Price", *Egypt Oil & Gas,* 11/10/2022, (accessed 14/06/2023), https://egyptoil-gas.com/news/prime-minister-issues-decree-to-reset-natural-gas-selling-price/

[62] (n.a.), "Egypt's Jan-April natural gas, LNG export revenues reach $3.892 bln", *Reuters,* 31/05/2022, (accessed 14/06/2023), https://www.reuters.com/business/energy/egypts-jan-april-natural-gas-lng-export-revenues-reach-3892-bln-data-2022-05-31/

[63] Mubasher, "Egypt's natural gas exports reach $8.4bln in 2022", *Zawya,* 28/12/2022, https://www.zawya.com/en/economy/north-africa/egypts-natural-gas-exports-reach-84bln-in-2022-srqb396i, (ac-

This monopoly cannot continue unless Egypt provides open and direct access to these terminals for gas that is not exclusively produced in Egypt. Otherwise, both Israel and Cyprus would be forced to develop their own LNG export alternatives in order to diversify their marketing options. Such an alternative that would diversify exports for both Cyprus and Israel, has been proposed by Energean in 2022 and calls for the laying of a 215km pipeline linking the company's FPSO (Floating Production and Separation Offshore) unit located in the Israeli EEZ with a Floating LNG station permanently moored offshore the Vasilikos area in Cyprus.

The $350 million pipeline will have a transportation capacity of around 4 bcma and could transport gas from Energean's yet untapped reserves, such as Karish North, Olympos and Athena (by 2024-2025), but could also export gas from Leviathan Phase 2 (by 2025/26) and/or Aphrodite (by 2026). Such an option would give -*ad minimum*- a negotiating leverage for Israeli and Cypriot exporters vis-à-vis Cairo and -*ad maximum*- a genuine bankable option securing export diversification to both Tel Aviv and Nicosia.[64]

Meeting the 2027 deadline for the start date of Aphrodite's exports, is imperative, not only because Cypriot gas may be able to replace Russian gas, particularly in south-east EU markets (i.e., the largest Long-Term gas contract Gazprom has in Greece expires in 2026). It is also imperative because taking an FID for Aphrodite within this year will signal to the developers of Cyprus' western gas discoveries, the determination of Nicosia to truly 'energize' its heretofore dormant hydrocarbon potential. This determination, if proven, will allow Nicosia to push forward for the joint monetisation of its western fields in ways that could lead to producing gas by 2028/2029.

7. Conclusion

The effects of the Russian-Ukrainian War have been catastrophic for the EU-Russian gas trade. Within less than a year after Russia's invasion of Ukraine, the edifice of the Russian-EU energy trade has all but collapsed. The EU has imposed a total ban on Russian crude oil, oil product, and coal exports, as a combination of embargoes, boycotts and infrastructure sabotage has drastically curtailed Russian gas exports to the EU, despite the absence of formal EU sanctions against Russian gas trade. More importantly, the EU has decided, as declared in its RepowerEU strategy, to eradi-

cessed 14/06/23)

[64] Iain Esau, Cyprus pipeline and LNG facility back on agenda after Israeli gas discoveries, *Upstream*, 13/04/2023, (accessed 14/06/2023), https://www.upstreamonline.com/field-development/cyprus-pipeline-and-lng-facility-back-on-agenda-after-israeli-gas-discoveries/2-1-1435459

cate Russian gas exports from its energy mix by 2027 The expansion of Norwegian pipeline gas and US LNG exports to the EU throughout 2022 were part of the EU's answer, but the EU has yet to secure long-term gas contracts that could effectively replace the approximately 155 billion cubic meters (bcm) that Gazprom and other Russian gas companies exported in 2021.[65]

In order to further diversify its gas import sources, the EU has signed a series of MoU with what EU Commission President Ursula von der Leyen has called 'trustworthy suppliers',[66] including, in June 2022, a MoU with Egypt and Israel that has highlighted the importance of the Eastern Mediterranean as a partial long-term alternative to Russian gas. During that same year, Exxon confirmed a 2019 discovery in the Cypriot EEZ, the Glaukos field, while ENI and Total made two important discoveries in Cyprus Block 6, the Zeus and Cronos fields, thereby further expanding the Republic of Cyprus' (RoC) export potential, to approximately 14-15 TCF.

Unfortunately Cyprus' chronic failure to monetise these reserves, in combination with the comparative 'maturity' of Egyptian exports that are reaching EU markets since 2020 and the expected rise in US and Qatari exports by 2027, are seriously questioning the ability of the RoC to contribute to the replacement of Russian gas exports to Europe If Cyprus does not succeed in taking an FID for the Aphrodite field promptly, it seriously jeopardises its chances of exporting any gas to Europe within this decade, as readier LNG suppliers will be in a position to cover the EU's need to effectively substitute Europe's Russian gas imports on a long-term basis.

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[65] BP (no11), 28

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