

EU Gas Consumption Before Russia-Ukraine War and Future Perspectives

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Abstract

Security issues have always been important for every country. It was mostly identified with the military. But later it was explained that it depended on the following conditions: security for whom, how much, from what, by what means, at what cost, and in what period.

Energy is needed for the economy. It is used in various sectors, like, industry, transport, household, etc. Oil and natural gas are still considered significant energy resources in the world.

Some examples from history can be drawn, like the 2006 and 2009 gas wars between Russia and Ukraine. Then Russia cut gas supplies to Ukraine as well as the EU to show its 'gas' power. But after starting of the war between Russia and Ukraine, the Russian threats became much clearer and the partnership more unreliable than it was.

The purpose of the present issue is to analyse how Russia tried to increase its gas share in EU consumption and import, which also means the soaring Russian political influence on the EU by increasing the gas supply to the EU with the recovering gas transit through Ukraine, and the application of NordStream2 and TurkStream pipelines. Its purpose is also to give information about EU member countries consuming and importing Russian gas before and after the war of Russia-Ukraine (future perspective) (February 24, 2022).

Here are used quantitative and qualitative methodologies to investigate and compare the world/EU energy/gas consumption in 2020 in the background of energy importance and economic-political experiences.

At the end of the presented article, there are given logical conclusions, which will help and provide the proper society, business, or any interested persons with the proper issues.

Keywords: *Energy security, Natural gas, EU, Russia, Ukraine.*

Introduction

Natural gas is a significant energy resource globally, especially in the EU. Russia was and is still the leading gas supplier to the EU and, in general, Europe. In the early years of 2006 and 2009, there were tensions between Russia and Ukraine. Then Russia decided to cut the gas supply to Ukraine and indirectly the EU, too, as Ukraine was a Russian gas transit country to the EU. It meant that Russia demonstrated its 'Gas Power' to the EU. All of these resulted in negative economic and energy impacts on them. Even though the EU tries to diversify its gas-importer countries or remove gas consumption from other energies, the circumstance remains the same. Unfortunately, the reality has stayed the same since February 24, 2022, when Russia invaded Ukraine.

In the presented work there is discussed Russia's strategy from 1960 up-to-date. After 2006 and 2009, Russia first recovered the gas supply through Ukraine to the EU in 2019. It became much more vulnerable after the Russia-Ukraine war began on February 24, 2022. The purpose of the recent article is to analyze the impact of Russia on the EU as it was trying to increase the gas supply by recovering the gas transit pipeline through Ukraine to the EU and the application of NordStream2 and TurkStream pipelines. The study also includes calculating which EU member countries are the main Russian gas consumers and importers as it will give Russia the ability to provide a 'stable and secure gas supply and strengthen its power with its energy over the EU. At the end of the article, the conclusions are summarised and further developed for future studies.

Literature review and research methodology

Security has always been significant for countries. However, paradoxical as it may seem, security has yet to be an essential analytical concept for most security studies scholars. During the Cold War, security studies primarily comprised scholars interested in military statecraft. Nevertheless, it depends on specifying the problemata: security for whom, how much, from what threats, by what means, at what cost, and at what time.

Several kinds of security, such as state security, social security, economic security, energy security, etc., represent the essential parts of national (state) security, etc. (Baldwin, 1997).

Energy security is interpreted as follows: reliable, affordable access to all fuels and energy sources (IEA - International Energy Agency, 2021).

According to the publication (Khatib, 2015), energy security is also the continuous availability of energy in varied forms; it has many aspects and means less vulnerability of energy supplies. They are possibilities to meet demand and supply to each other at any time and at reasonable prices and to protect the environment. It is also called national energy security.

Generally, energy is used in different sectors, like industry, transport, household, Etc (Tabagari, 2021). For example, in the U. S. 33% of its total energy consumption was used in the industrial sector, 26% - in the transportation sector, 22% - in the residential sector, and 18% - in the commercial sector in 2020 (EIA - U. S. Energy Information of Administration, 2022).

There are various energy resources in the world. According to the official statistical data, in 2020, the share of total oil consumption was 31.2% of the world's energy consumption, coal - 27.2%, and gas 24.7% (BP Statistical Review of World Energy, 2021). As a result, hydrocarbons took 55.9% of the world's energy consumption in 2020. According to the energy consumption of sectors in the U. S.: 33% of total energy consumption was natural gas in the industrial sector and 27.2% - in petroleum (oil); As for the transportation sector – here natural gas took 4.5% of the world energy sector and 89.8% - of petroleum (oil) (EIA - U. S. Energy Information Administration, 2021). As a result, petroleum and natural gas also took dominant roles in the U. S. and the world.

One of the first cases of energy security was revealed in 1973 when Saudi Arabia decided to cut oil export with Arabian countries to countries friendly to Israel (the U. S. and the West), which was against Saudi Arabia. It was called the 1973 Oil Crisis. It caused the quadruple oil price, which negatively impacted the countries' economies and energy security, mainly the U. S. and Europe (Yergin, 1991).

One of the following significant circumstances happened in 2006 and 2009: The gas infrastructure was united among Ukraine, Europe, and Russia during the Post-Soviet Union, and natural gas was considered the leading energy resource. In the 1960s, gas was produced in Ukraine, which was reduced in the 1970s. In 1991 the Soviet Union broke up. Ukraine was already heavily dependent on gas from the western Siberian fields, Russia. The Post-Soviet countries were in an unfavorable situation, especially Russia, as gas was the primary source of income (Pirani, Stern, & Yafimava, 2009).

Ministry of Soviet Gas Industry (Министерство Газовой Промышленности СССР) (Gazprom, 2022), which Regulated natural gas production and supply, was transformed into a state-controlled committee in 1989 (Makarova & Makarova, 2004). It was later reorganized as Gazprom, an open joint-stock company established on February 17, 1993 (Gazprom, 2022).

89% of the assets belonged to Russia, 9.5% to Ukraine, and 1.5% to Belarus. Russia believed that after the collapse of the Soviet Union, Gazprom should have been the legal successor and the owner of the pipeline system (Makarova & Makarova, 2004).

However, all of these pipelines passed through the territories of the states that were controlled by themselves (Kosowska & Kosowski, 2016), and Ukraine did not consider Russia's will. Furthermore, at the same time, Ukraine had debts to Russia in the gas sector and refused Russian suggestions to pay them flexibly. However, later, Russia and Ukraine agreed on the delivery of Central Asian gas through Ukraine and past debts, too (Stern, 2006).

The election of Viktor A. Yushchenko as Ukraine's president in 2003 pulled the former Soviet country from Russia's sphere of influence. With parliamentary elections coming up in March, a gas shortage and the winter could discredit him and weaken his party. Russia tried to bill Ukraine and charge from \$50 to \$220 to \$230 per 1 000 m³ of natural gas. Moreover, that would negatively affect its economy (Kramer, 2006).

In May 2005, 7.8 billion m³ of gas was revealed in Ukrainian storage reservoirs. It was considered that Gazprom deposited it there last year, but it was not accessible for Russia despite forty requests sent from October 14, 2004, to March 22, 2005; during that time,

Russia interrupted Turkmen and Uzbekistan's gas supply to Ukraine and EU (Stern, 2006). On January 1, 2006, Russia cut the natural gas supply to Ukraine, and at the same time, gas transit was disrupted towards Europe (Tabagari, 2018).

In 2004 Russia supplied 22 European countries with 153.2 bcm of gas and 13 EU member countries with 119 bcm of gas among them (EU member countries in 2004 Germany – 36 bcm, Italy – 22 bcm, France – 13.2 bcm, Hungary – 9 bcm, Slovakia – 7.5 bcm, Poland – 7 bcm, Austria – 6.8 bcm, Finland – 4.5 bcm, The Netherlands – 4.1 bcm, United Kingdom – 3.8 bcm, Greece – 2.4 bcm, Belgium – 2 bcm, Slovenia – 0.7 bcm – in total 119 bcm). And this was increased to 156.1 bcm of gas for European countries in 2005 (Gazprom, 2005) (European Commission, 2022).

In 2005, the Russian gas cut caused the following results: Ukraine lost 100% of Russian imports, Hungary 40%, Poland – about 14%, Austria, Slovakia, and Romania – supplied down by a third. The following countries were depended on the Ukrainian pipeline: Slovakia - 100% of gas consumed is from Russia; Bulgaria - 94%; Greece - 92%; Czech Rep - 73%; Hungary - 72%; Austria - 63%; Poland - 60% (BBC News, 2006). Germany said there was also a falling gas supply, but it did not mention how much; France had a 25-30% drop in supply.

In addition, by January 4 Russian gas supply was recovered to Europe (Stern, 2006). This disruption was politically motivated to show Europe and especially the EU Russian influence and 'gas' power.

The second case of gas interruption happened in 2009; three dangers appeared: the cold winter, the financial crisis, and the Russian gas disruption to Ukraine (Kovacevic, 2009). Ukraine had a lot of Russian debt again; it required more enormous gas tariffs from Ukraine than from European countries; Russia doubted that it 'stole' gas, but the country refused it on January 5, 2009, and on January 6, Russia stopped gas supply towards Ukraine and Europe. It was restored on January 22, 2009; finally, the mentioned disagreement was ended with the talks between the prime ministers of both countries: Ukraine would receive natural gas at a price 15% lower than the European tariff (Stern, 2006) (Kovacevic, 2009) (Tvalchrelidze, Berberashvili & Otarashvili, 2016) (Pirani, Stern, & Yafimava, 2009).

Gas import of Bosnia and Herzegovina and FYR Macedonia was 100% dependent on Russia, Bulgaria, Serbia - 92%, Croatia – 48%, and Romania – 33%; Russian gas cut was 100% in Bulgaria, Serbia, Bosnia, and Herzegovina, FYR Macedonia and Moldova, 80% - in Greece, 40% - in Croatia and 34% in Romania; this fact negatively impacted mostly on industrial and household consumers as most of the mentioned countries had or did not had enough gas storages or/and diversified gas import countries (Kovacevic, 2009).

In 2009 Norway met the Russia-Ukraine gas war technically unprepared: it failed to supply enough gas to European countries. However, the United Kingdom helped them; Eastern Europe was in the worst situation. Therefore, during this period, liquefied petroleum gas was supplied to them from Spain and Greece (COMMISSION OF THE EUROPEAN COMMUNITIES, 2009).

If the crisis had continued for a longer time or spread to other countries of the EU, the impact could have been much more devastating for the economy, policy, and energy security. Some countries were able to replace Russian gas by importing additional LNG, drawing gas from storage, fuel-switching, and extra commercial deliveries from neighboring countries in the short term. In some cases, gas was cut off to large industrial companies (for example, Bulgaria, Romania, Hungary, and Poland) to keep gas flowing to households. Where significant shortages occurred, industrial customers had to reduce demand (e.g., Bulgaria, Romania, Poland's largest fertilizer plant and refinery). Some member states, such as Hungary, and Slovakia, issued calls to cut back on gas consumption for industry (COMMISSION OF THE EUROPEAN COMMUNITIES, 2009).

On February 24, 2022, Russia invaded Ukraine; NATO expansion eastward is seen by Russians as directed against their country, and the president of Russia has always spoken for many years that if continued, the expansion would likely be met with serious resistance by the Russians, even with military action. Russian elite and the broad public were always opposed to the American rockets in Poland and Romania and the arming of Ukraine (Sunny, 2022). Russia friendly warned NATO even in 2007 that the alliance needed to back off; In his memoir, *Duty*, Robert M Gates, who served as secretary of defense in the administrations of both George W Bush and Barack Obama, said that trying to bring

Georgia and Ukraine into NATO had been truly overreaching. The president of Russia demanded that NATO provide guarantees on several security issues and that it never offers membership to Ukraine (Carpenter, 2022). Russia's invasion of Ukraine has taken this debate further and prompted strategic EU policy changes (European Commission, 2022).

Interestingly, the EU tries to respond properly to Russia's reaction.

In March 2022, the EU member countries decided to end their dependence on it. They agreed to forbid 90% of oil imports before 2023, but it did not refer to pipeline oil imports. The EU member countries are also planning to diversify energy import sources, including natural gas, develop renewable energy resources in the least time, and upgrade the energy efficiency and interconnections of natural gas and electricity network. They also aim to improve and develop gas storage systems. The EU tries to reduce their gas consumption by 15% in winter (European Council, Council of the European Union, 2022).

The research is based on analyzing the desk research and secondary literature sources. Here used, quantitative, qualitative, and comparative analyses. The data on world energy and gas consumption is drawn from 1970 to 2021; special attention is paid to 2020 and 2021 data. There is a calculated and deeply analyzed of the Russian gas supplies, future gas projects, and how they meet the volume of EU gas consumption.

Results and discussion – analyze EU gas consumption

The share of Russian gas in the EU

Natural gas is one of the most consumed energy resources in the world; Russia took first place with 20% of the world's natural gas reserves in 2020 and the second one – Iran with 17%; Russia took second place with 17% after the U. S. with 24% of the world gas production (BP Statistical Review of World Energy, 2021). Russia's main gas market was and is still the EU. In 2020 the EU was second place with 9.9% (379.9 billion m³) of the world's natural gas consumption (3 822.8 billion m³), it was decreased by 3.1% compared to 2019 (BP Statistical Review of World Energy, 2021).

Energy security and its stable supply became one of the most significant issues for the EU after the 2006 and 2009 gas wars. In 2020 natural gas consumption took third place

among other energy consumptions and was 24.7% of the total energy consumption in the world (See figure N1) (BP Statistical Review of World Energy, 2021).

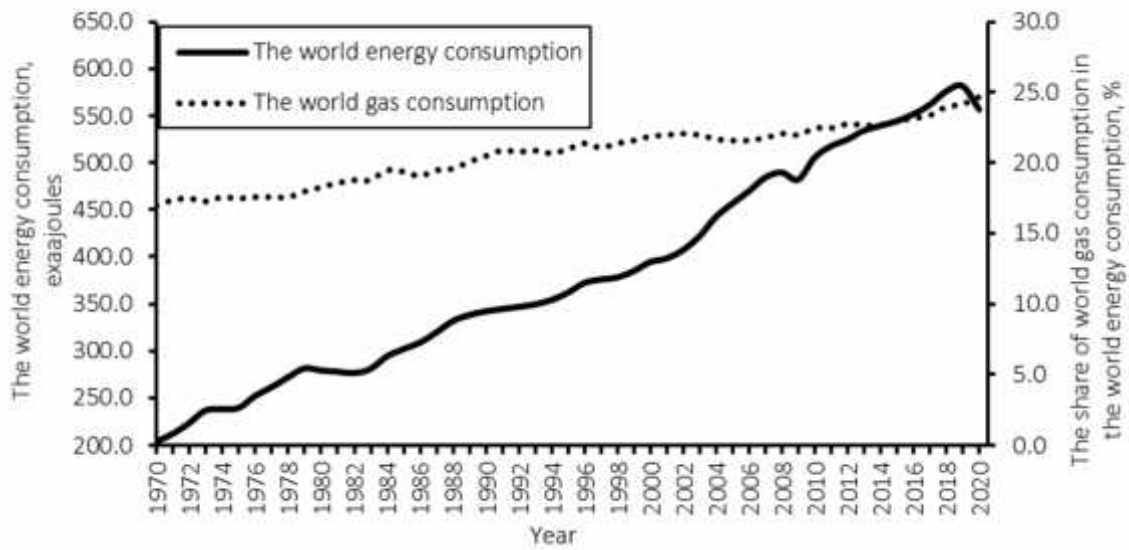


Figure N1. *The world energy consumption (exajoules) and the share of the world’s natural gas consumption in the world energy consumption in 1965-2020.*

As for EU gas consumption, it also basically had an increasing tendency in 1965-2020 and the share of EU gas consumption was 24.6% of total EU energy consumption (Fig.: II) (BP Statistical Review of World Energy, 2021).

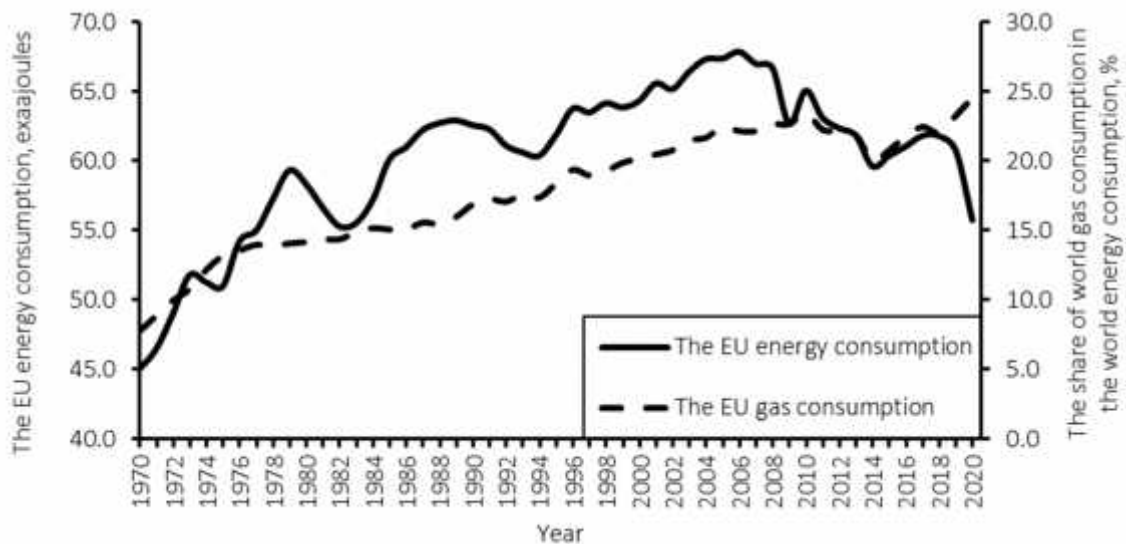


Figure N2. *The EU energy consumption (exajoules) and the share of the EU natural gas consumption in the world energy consumption in 1965-2020.*

In 2020 shares of total Russian gas supply in EU gas consumption and import were taken with **41.9%** and **36.1%** (Tables N1, N2) (BP Statistical Review of World Energy, 2021). As there is shown, UpToDate Russia occupies a big share in EU gas consumption and import, like in 2006 and 2009 (Tabagari, 2021).

Table N1. *The share of Russian gas supply in EU gas consumption in 2020.*

Russian gas supply via pipeline	Russian LNG supply	Total Russian gas supply	EU gas consumption	Share of total Russian gas supply in EU gas consumption
145.0 bln m³	14.0 bln m ³	159.0 bln m ³	379.9 bln m ³	41.9 %

Table N2. *The share of Russian gas imports in total EU gas imports in 2020.*

EU gas import via pipeline	EU LNG import	Total EU gas import	Russian gas import	Share of total gas import in the EU gas import
359.5 bln m³	81.4 bln m ³	440.9 bln m ³	159.0 bln m ³	36.1 %

Russian pipelines towards Europe: Nord Stream and Nord Stream 2 Pipelines.

After the 2006 Russia-Ukraine gas war, Russia decided to start building the new Nord Stream pipeline (the first pipeline before the Nord Stream 2 pipeline). This project envisaged the construction of an additional gas pipeline along the Yamal-Europe pipeline. The main idea was to reduce the gas transit through the Ukrainian territory (Tabagari, 2021). The pipeline entered into operation in 2011-2012; it was a Russian response to Ukraine; in 2017-2018 Russia fully stopped gas transit via Ukraine and two folded gas supplies via the Nord Stream pipeline (Tabagari, 2021) (Naftogaz Europe, 2019).

NordStream2 is a new export gas pipeline, which was based on its successful experience in building and operating the Nord Stream gas pipeline. Both pipeline capacities are 110 billion m³ per year; in April 2017, Nord Stream 2 AG signed the financing agreements for the Nord Stream 2 gas pipeline project with ENGIE, OMV, Royal Dutch Shell, Uniper, and Wintershall. These five European energy companies will provide long-term financing for 50 % of the total cost of the project; in September 2018, pipelaying operations commenced in the Baltic Sea (Gazprom, 2022).

On 15 April 2021 the U. S. signalled that it would impose sanctions against Russia if it continued or escalated its destabilizing international actions (like undermining the conduct of free and fair democratic elections and democratic institutions, engaging and facilitating malicious cyber activities against the United States and its allies and partners, etc.) (WhiteHouse, 2021). But Russia denied it (Reuters, 2021). On 21 May 2021, the Department of State imposed sanctions on four Russian ships involved in the building of Nord Stream 2, though it was considered that would not be enough to stop the pipeline construction. According to the U. S. government, the sanctions came after cyber-criminals who were based in Russia. It took a major American oil pipeline offline, leaving thousands of petrol stations with a lack of fuel in the U. S. Yuriy Vitrenko, the chief executive of Ukraine's state-owned energy company, Naftogaz, said Kyiv would press Washington to impose sanctions to stop the pipeline (BBC, 2021). But the EU did not take into account the U. S. will.

The construction of the TurkStream pipeline was started on 1 December 2014. In September 2016, Gazprom received the first permits for the TurkStream project from the Turkish authorities (Gazprom, 2022). TurkStream pipeline is applied, and the power of Russia will be increased over Europe and, especially, EU member countries. The capacity of the TurkStream pipeline is 31.5 billion m³ (15.75 billion m³ per each of the two strings) (DW, 2019) (DW, 2019) (DW, 2019) (Gotev, 2020) (Gazprom, 2022) (Gazprom Annual Report, 2020).

Gas Transit via Ukraine

Even though Russia cut gas transit via Ukraine towards the EU, it changed its mind: Moscow and Kyiv signed a 5-year contract on Russian gas transit to Europe through Ukraine on 30 December 2019, and officially the gas transit flowed after 31 December 2019. It was planned that 65 billion m³ of natural gas should be supplied via Ukraine in 2020, and it would be decreased to 40 billion m³ of gas in 2021-2024; though it is expected that this agreement will be prolonged in the future ten years. Moscow agreed with Ukraine to pay \$2.9 billion to settle a long-running dispute on transit fees (Soldatkin & Kiseloyva, 2019).

According to the calculation of the present work, Russian gas volume will reach from 159 billion m³ to 285.5 billion m³. And the share of Russian gas in EU gas consumption will be also increased from 41.9% to **75.2 %** (285.5 billion m³/379.9 billion m³*100%) and as for the share of import in EU total gas import – from also 41.9% to **64.8 %** (285.5 billion m³/440.9 billion m³*100%) (Table N3) (BP Statistical Review of World Energy, 2021).

But after starting of the war between Russia and Ukraine, the Nord Stream Pipeline project is stopped but not cancelled. In addition, the project is opposed by the U. S., U. K., Poland and Ukraine (BBC.com, 2022).

Table N3. *Russian gas future shares in the EU gas consumption and gas import according to 2020 data.*

Russian gas import the 2020	The capacity in Nord Stream Pipeline	The capacity of the 2 Stream Pipeline	Russian Transit Via Ukraine	Russian Gas Share (%) in EU Consumption	Russian Gas Share (%) in EU Gas Import
159 bln m ³	55 bln m ³	31.5 bln m ³	40 bln m ³	75.2%	64.8%

EU member countries depended on Russian gas

According to the statistical data (Table N4) natural gas main consumer/importer countries are those states which are situated on the west side of Europe next to Russia; Norway was and is still one of the basic gas producer/exporter countries (BP Statistical Review of World Energy, 2021). Table N4 represents that Germany, Italy, France and other ones were the main consumers and importers countries of Russian gas. It took 65.1% of total gas consumption and 68.6% of the total gas import of Germany in 2020. Here we must explain that Germany imported more natural gas than it needed (consumption – 86.5 billion m³, import – 102 billion m³) (Cornot-Gandolphe, 2018), as it has got underground natural gas storage where it keeps them for future purposes (to avoid any unexpected accidents). ‘Germany’s gas’ importer countries were also the Netherlands, Norway and so on. As for Italy, Russia took 67.7% of the total gas consumption of Italy and 63.8% of its total gas import; Russia took 18.7% of the total gas consumption and import of France; As for Poland, its share of gas consumption in Poland’s total energy consumption was 41.6%, as for the share of Russian gas supply in Poland’s gas consumption was 45% and 55.02% - import in 2020; Hungary, Austria, Czech Republic, Greece and Bulgaria also were Russian gas depended on states (more than 40%) (Gazprom, 2020) (BP Statistical Review of World Energy, 2021). Russia is the main part of Germany in the natural gas sector.

TableN4. *Russian gas supplies via LNG and pipeline to EU member countries in 2020 (billion m³)¹.*

¹ The total share of gas consumption of the countries given in the table as * are approximately 18% of the world energy consumption.

Consumption	The share in their	Production	Import	LNG	Pipeline	The share of	The share of
86.55	15.20	4.50	-82.05	0	56.30	65.10	68.60
67.66	3.50	3.88	-63.79	0	19.70	29.10	30.90
40.66	2.20	0	-40.66	5	2.60	18.70	18.70
32.41	1.50	0	-32.41	3.4	0	10.50	10.50
21.56	41.60	3.93	-17.63	0	9.70	45.00	55.02
17.00	4.90	0	-17	0.9	0	5.30	5.30
36.56	5.30	19.97	-16.59	0	11.20	30.60	67.50
10.18	7.40	0	-10.18	0	8.60	84.48	84.48
8.53	6.70	0	-8.53	0	10.60	124.27	124.27
8.46	31.80	0	-8.46	0	4.00	47.28	47.28

Country	Consumption	The share in their	Production	Import	LNG	Pipeline	The share of	The share of	Nº	Country
Portugal	5.99	2.60	0	-5.99	0	0	0	0	1	Germany
Greece	5.70	11.40	0	-5.70	0	3.10	54.39	54.39	2	Italy
Ireland	5.31	*	0	-5.31	0	0	0	0	3	France
Slovakia	4.98	*	0	-4.98	0	7.60	152.61	152.61	4	Spain
Bulgaria	2.92	*	0	-2.92	0	2.30	78.77	78.77	5	Poland
Croatia	2.90	*	0	-2.90	0	1.80	62.07	62.07	6	Belgium
Romania	11.32	11.40	8.71	-2.61	0	1.00	8.83	38.31	7	Netherlands
Lithuania	2.36	*	0	-2.36	0	0	0	0	8	Hungary
Finland	1.96	12.10	0	-1.96	0	0	0	0	9	Austria
Latvia	1.07	*	0	-1.07	0	0	0	0	10	Czech Republic

Consumption (bln m ³)	The share in their total energy	Production	Import	LNG	Pipeline	The share of Russian gas	The share of Russian gas	Nº
1.06	3.40	0	-1.06	0	0	0	0	11
2.32	*	1.38	-0.94	0	1.80	77.59	191.49	12
0.86	*	0	-0.86	0	0.4	46.51	46.51	13
0.73	*	0	-0.73	0	0	0	0	14
0.43	*	0	-0.43	0	0	0	0	15
4.43	1.70	111.45	107.02	0	0	0	0	16
Total (each column)				14.00	137.20			17
								18
Total								19
								20

Country	Sweden	Denmark	Slovenia	Luxembourg	Estonia	Norway
Nº	21	22	23	24	25	26

According to Figure N3, as natural gas is considered one of the low-carbon energy resources and will be consumed by 2050, at least; it is easy to imagine the grand future strategy and influence of Russia (BP, 2020).

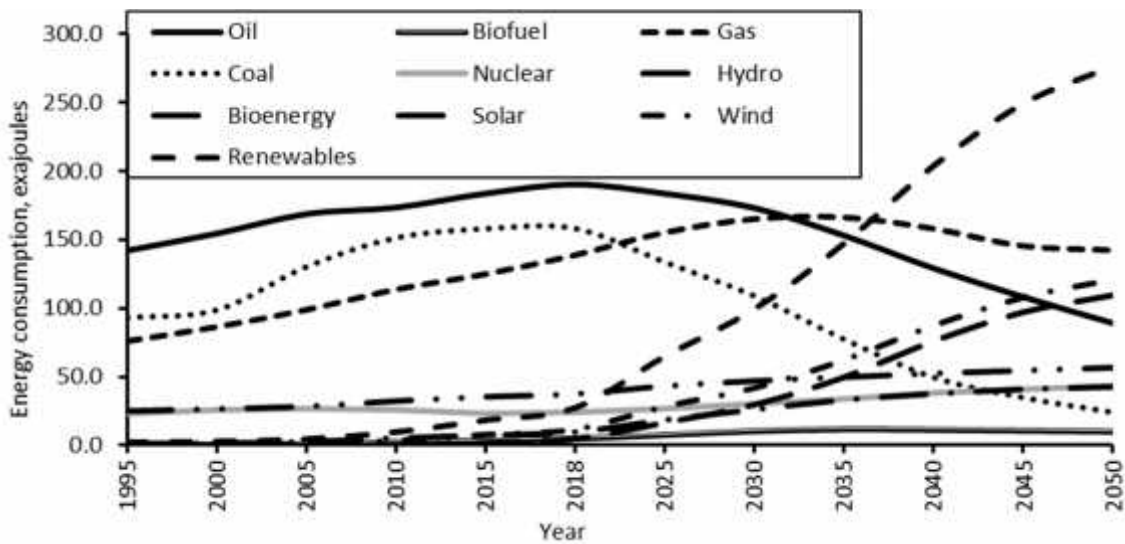


Figure N3. Consumption of different energy resources in 1995-2050 (exajoules).

Diversification of Natural gas consumption in the EU

Natural gas storage in the EU

Natural gas storage can also be considered one of the parts of energy security. The capacities of natural gas storage in the EU are given in Table V and Table VI (GIE AGSI, 2021) (Convert-me, 2021). There were revealed significant results: most of the gas storage of EU member countries is not full of liquified gas. According to this statistical data, Germany took the first place with the biggest gas storage capacity among the other EU member countries, then it was followed by Italy, the Netherlands, France, etc.

Table V there is shown that Germany may formally have the biggest gas storage but the share of working gas storage capacity in gas consumption was only 25.8%, Netherlands – 36.4%, Italy – 27% and France – 29.3%; and as for the share of working gas volume in gas import – it was also less in the Netherlands with 44% than in case of Germany (17.6%), Italy (22.6%) or France (22.1%) by February 2022, but by June 2022, as it is shown in Table N6, their data were decreased except for Denmark, Poland and Portugal.

Table N5. *Capacities of natural gas storage, the working gas volume and the share of working gas in gas import of EU member countries by December 2, 2022.*

Nº	Country	The working gas in storage (mln m ³)	The share of working gas storage capacity in gas consumption %	The gas in storage (mln m ³)	The share of gas in storage in gas import %
1	Austria	8.80	103.20	4.00	46.90
2	Belgium	0.80	4.70	0.60	3.50
3	Bulgaria	0.50	17.10	0.40	13.70
4	Croatia	0.50	17.20	0.30	10.30
5	Czech Republic	3.30	39.00	2.50	29.60
6	Denmark	0.80	34.50	0.60	63.80
7	France	11.90	29.30	9.00	22.10
8	Germany	22.30	25.80	14.40	17.60
9	Hungary	6.30	61.90	4.10	40.30
10	Italy	18.30	27.00	14.40	22.60
11	Latvia	2.00	186.90	1.30	121.50
12	Netherlands	13.30	36.40	7.30	44.00
13	Poland	3.30	15.30	3.10	17.60
14	Portugal	0.30	5.00	0.20	3.30

15	Romania	3.10	27.40	2.00	76.60
16	Slovakia	3.60	72.30	2.30	46.20
17	Spain	3.20	9.90	2.40	7.40

Table N6. *The capacity of gas storage in EU member countries
by December 2 and June 4, 2022.*

№	Country	The capacity of gas storage (mln m ³), 2-	The capacity of gas storage (mln m ³), 4-	Changes, %
		Dec	Jun	
1	Austria	4	3	-100
2	Belgium	0.6	0.3	-30
3	Bulgaria	0.4	0.1	-30
4	Croatia	0.3	0.1	-20
5	Czech Republic	2.5	2.1	-40
6	Denmark	0.6	0.6	0
7	France	9	6.4	-260
8	Germany	14.4	10.9	-350
9	Hungary	4.1	2	-210
10	Italy	14.4	9	-540
11	Latvia	1.3	0.8	-50
12	Netherlands	7.3	5.3	-200
13	Poland	3.1	3.2	10
14	Portugal	0.2	0.3	10
15	Romania	2	1	-100
16	Slovakia	2.3	1	-130

17	Spain	2.4	2.2	-20
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EU and gas consumption

EU is trying to develop renewable and hydrogen energy resources (Russell, 2020), but even if war exists between Russia and Ukraine, the EU will be able to reduce 66% of the Russian gas import till 2025, which means that its power and its influence will be kept up to 2025, at least (Bellona, EUROPA, 2022). Developing renewable energy resources and their infrastructure requires significant investments; additionally, constructing gas import infrastructure (pipelines and LNG terminals) is expensive. Besides, it also needs the consensus of the appropriate countries.

EU and gas consumption after Russia-Ukraine war – Future Perspectives

After the Russian invasion of Ukraine, the EU tries to replace Russian gas with other gas importer countries or fuels. By 2025, clean energy and energy efficiency can remove 66% of Russian gas imports. It means that the EU is trying to grow the consumption of renewable energy and efficiency policy in the "Fit for 55" package 2. All these issues also require investment programs, administration, and market development (to provide the supply-demand of energy) (Bellona, EUROPA, 2022). The IEA's 10-Point Plan to Reduce the European Union's Reliance on Russian Natural Gas includes various steps to gain the goal; of accelerating efforts to provide consumers, businesses, and industries with the means to use clean and efficient alternatives to natural gas. All these actions also provide a clean climate and protect the environment; the EU is also trying to build LNG terminals and interconnectors, and this IEA's 10-point Plan means not to sign any contracts, gas import from other sources, use solar and wind to output the energy, support nuclear and renewables, ramping up energy efficiency measures in homes and businesses (IEA - International Energy Agency, 2022). The EU and The U. S. signed the contract on liquified natural gas, which will provide only 10% of the gas that is currently imported from Russia (Leggett, 2022).

On April 27, 2022, Russia cut gas supply to Poland and Bulgaria via the Yamal pipeline, and this fact was evaluated as an attempt to blackmail the EU member states.

According to the official information, the EU is ready for Moscow's step: Poland has enough gas storage (76% complete), and also, on May 1, a new gas pipeline will be opened between Poland and Lithuania, which will help Poland have access to the LNG terminal. As for Bulgaria, it has negotiated with Greece and Turkey to import LNG – liquefied natural gas. In addition, Poland imported 53% of its gas imports from Russia and Bulgaria – 90%. As it is known, Hungary delivers Russian gas through Bulgaria and Serbia. However, as transit gas supplement is independently regulated from Bulgaria's pipeline, Russian Gazprom will also keep gas transit to Hungary and Austria. Nothing has happened to the Czech Republic yet. The main reason for halting the natural gas supply to Poland and Bulgaria was the refusal to pay the debts in the roubles (France24.com, 2022; BBC.com, 2022). However, Russia denies the blackmail of gas (Aljazeera.com, 2022).

Conclusion

The article shows that the EU still faces challenges. Most EU member countries need more gas storage to provide their gas consumption by 2025, as their leading gas supplier remains in Russia. As gas is unremovable, Russia is keeping its power over the EU. However, on the other hand, the EU tries to respond to Russia's reaction appropriately, but more is needed. In addition, as gas consumption is considered one of the lowest carbon energy resources, its consumption may be kept until 2050 in the world.

The EU has to continue the diversification of gas import sources and energy consumption to avoid pressure in the future. Nevertheless, they are just planning.

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