

Serbian Energy Sector in a Gap Between East and West

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**Dejan Brkić** 

Abstract

Serbia's energy sector is heavily reliant on Russian influence. On the other hand, Serbia's status as a candidate country for joining the European Union (EU) membership requires active working toward diversifying energy sources of supply. In the past decade, Serbia has secured a reduced price for natural gas through a bilateral agreement with Russia, addressing the shortfall in its domestic production. The former agreement priced Russian gas at US\$270 per thousand cubic meters and expired in 2021. The new deal links gas prices to crude oil and ranges between US \$310 and US\$408, maintaining its competitive position as one of Europe's lowest import prices. Furthermore, alongside the new gas pipeline for Russian gas exports, the EU is funding the construction of a new interconnector, both with entry points from Bulgaria. Serbia also faces significant dependence on crude oil, and this reliance is compounded by the inability to import it from Russia any longer. Opposite, Serbia is usually self-sufficient in electricity production which still remains under state ownership. The domestic exploration and processing of oil and gas, as well as the sole underground gas storage facility in Serbia, have partial ownership by Russian Gazprom while the transportation of gas is under the full control of the Serbian government. This Communication about the energy situation in the Republic of Serbia put particular emphasis on the evolving political dynamics in the global energy market with a specific focus on the Russia–Ukraine war. The topic is also linked to the contentious status of the southern Serbian autonomous province, recognized as an independent state by the majority of Western nations but not by Serbia. It is feared that Serbia's energy dependence on Russia could have significant ramifications for its EU candidacy.

Keywords

Serbian energy security, natural gas supply, crude oil import, electricity, EU acquis, Russia-Ukraine war

Faculty of Electronic Engineering, University of Niš, Niš, Serbia

Corresponding author:

Dejan Brkić, Faculty of Electronic Engineering, University of Niš, Niš, 18100, Serbia.

Email: dejanrgf@tesla.rcub.bg.ac.rs



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Introduction

This communication gives a concise perspective on the policy of energy supply of the Republic of Serbia in light of the ongoing political developments in Europe and the contemporary global landscape. In this context, the emphasis is placed on crude oil and natural gas, both of which face shortages necessitating imports, while electricity production remains consistently self-sufficient. Furthermore, it provides an update to a review of Serbia's oil and gas sector which still remains relevant today, particularly in regard to the ongoing agreement with Russia (Brkić, 2009). Together with the unsolved status of Kosovo*¹, the relationship with Russia has evolved beyond being solely about energy policy, now encompassing substantial political implications linked to Serbia's path to European Union (EU) membership which is a top priority for the nation. Within the intricacy of Serbia's energy situation, the implications run deeper than initially can be perceived as holding profound significance not just for the nation but also for the broader geopolitical landscape in the context of the Russia–Ukraine conflict.

The energy sector stands as a pivotal industrial sector within Serbia. Due to limited domestic reserves of oil and natural gas, the nation relies significantly on the importation of crude oil and natural gas. The current contribution of renewable energy sources to the overall energy consumption is below 1%, not including hydropower. The annual consumption of all energy types surpasses domestic production in Serbia. However, there is potential for self-sufficiency in domestically generated energy, particularly in electricity, as oil and gas resources are inherently insufficient. Outside Kosovo* where the majority of reserves are situated (Arifi and Späth, 2018), Serbia boasts significant proven deposits of environmentally unfriendly² lignite, primarily extracted from surface mines and utilized for electricity generation. In essence, Serbia lacks high-grade coal resources.

Political issues

In the context of Serbia, the ongoing Russia–Ukraine conflict may be seen as a potential parallel to the North Atlantic Treaty Organization (NATO) intervention which targeted the Federal Republic of Yugoslavia back in 1999, a union comprising both Serbia and Montenegro at that time. These circumstances carry distinct political implications, extending beyond the energy sector and the nation's overall economy. They also have the potential to significantly impact Serbia's territorial integrity, particularly concerning the unresolved issue of the disputed recognition of Kosovo*. Serbia is progressing toward EU membership, but given its unique political position, it must maintain relatively positive relations with the Russian Federation (Solsletten, 2023). Western nations have imposed sanctions on Russia in response to the ongoing conflict between Russia and Ukraine, and they are also urging EU candidate countries to follow suit. These issues matter immensely in the broader context as they shape not only Serbia's energy policies and security but also its aspirations to align with EU standards and foster regional stability, all within the backdrop of ongoing geopolitical dynamics.

The primary political challenges impacting the Serbian energy sector are somewhat intertwined, encompassing three main issues: 1. EU membership, 2. Issue of Kosovo*, and 3. Relationship with Russia.

EU membership

To the author's understanding, the unresolved issue of Kosovo*'s status remains the primary political challenge in Serbia's journey toward EU accession. Despite repeated assertions that Serbia

does not need to recognize Kosovo* as an independent state, the key requirement is to normalize their relations. Serbia embarked on the journey toward EU membership in 2009 when it formally submitted its application. It attained the status of a full candidate in 2012, and the initial negotiation chapters were opened in 2015. Serbia maintains a position of military neutrality and nonalignment. The EU has not achieved the required unanimous decision among all member states to endorse the independence of contested Kosovo* (from an international legal standpoint, such a decision is not relevant, but for Serbia, it carries significant implications due to the EU full membership negotiation process). Anyway, to join the EU, Serbia has to solve “Normalisation of relations between Serbia and Kosovo*” under *acquis* requirements, which has been unique case that a candidate country has to deal with Chapter 35 “other issues.”

*Issue of Kosovo**

The Serbian autonomous province of Kosovo* and Metohija in the southwestern part of the country has been beyond Serbian authority since 1999, following the NATO intervention. Since then, the territory has been under United Nations (UN) jurisdiction, as per United Nations Security Council Resolution 1244/1999³. The self-proclaimed local Albanian administration declared independence as a separate state in 2008. Serbia, along with the majority of countries, has opposed this endeavor. However, the majority of western nations have provided support for this aspiration through military presence in the region and various political and financial means. Resolution 1244/1999 provides assurances regarding the territorial integrity of Serbia and permits the presence of Serbian military and police personnel, numbering in the hundreds. However, as of now, this presence has not been authorized. Kosovo* is recognized as an independent state by most western countries, primarily the majority of EU and European Economic Area members, as well as most NATO member nations. It is also recognized as such by Australia, New Zealand, Japan, South Korea, and Switzerland. However, Serbia does not recognize Kosovo* as an independent entity, considering it a *de jure* part of Serbia, specifically as the Autonomous Province of Kosovo* and Metohija. Russia, China, and over 100 other countries worldwide, including several EU member states, namely Slovakia, Spain, Greece, Romania, and Cyprus, do not recognize Kosovo*'s independence. Ukraine also does not recognize Kosovo* as a sovereign country. Serbia's position regarding Kosovo* is that the NATO intervention against the former joint state of Serbia and Montenegro (known as FR Yugoslavia at that time) in 1999 is considered illegal (Alexander 1999; Anderson, 2000); The NATO intervention was effectively retroactively partially legalized by UNSC Resolution 1244/1999, but at the time, it was seen as nothing more than an act of brutal illegal aggression. From the point of view of international law, the UN has not reached favorable decisions following very strict prescribed procedures through the UNSC; the International Court of Justice set up an advisory opinion⁴ in 2010 that “the declaration of independence of Kosovo* adopted on 17 February 2008 did not violate international law,” but anyway the declaration of independence still remained nullified by Serbia as unconstitutional and has remained unrecognized by the United Nations Security Council.

Relationship with Russia

The partnership with Russia holds significance because, at present, Serbia exclusively imports natural gas from Russia at highly favorable terms, given its limited domestic production. Russia, along with China, both as permanent members of the United Nations Security Council with the power of veto, supports Serbia's territorial integrity (Seliverstova, 2023). The EU has imposed

economic and political sanctions on Russia in response to the ongoing Russia–Ukraine conflict. As part of its accession process, Serbia is requested not only to align its legal system with the EU’s but also to adhere to its present foreign policy, which includes following these sanctions. Nevertheless, despite facing significant pressure, Serbia maintains its belief that, as a sovereign state, it possesses the right to abstain from imposing political, economic, or any other forms of sanctions on any nation, particularly if these sanctions are unilaterally dictated by other countries or groups of countries, except in cases where such sanctions are authorized by the UNSC. During the 1990s, the joint state of Serbia and Montenegro, known at the time as FR Yugoslavia, was subjected to UN sanctions that were legally imposed (but still considered illegitimate by Serbia), as outlined in UNSC Resolution 757/1992⁵. According to Serbia’s perspective, sanctions in any form primarily impact innocent individuals and vulnerable communities, rendering them counterproductive, costly, and ineffective.

Serbia has free trade agreements with Russia (since 2000), Belarus (since 2009), and Kazakhstan (since 2010), now repacked as a free trade deal with the Eurasian Economic Union (signed in 2019 and in force since 2021); Eurasian Union is an economic union of Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan). Knowing that Serbia has a similar deal with the EU, makes it the unique country with a free trade deal with both blocks for the goods entirely produced in Serbia (reexport is forbidden; also these deals require complex control in practice and do not work in a simple and practicable way as a custom union among member states of the EU). Additionally, China and Serbia started negotiations for a free trade agreement in April 2023. Both, the deal with the Eurasian Economic Union and increased Chinese investments in Serbia are sometimes seen as disturbing from the point of view of the western countries.

Overview of energy sector

The energy sector plays a pivotal role in Serbia’s EU accession journey, serving as a key nexus between economic development, sustainability, and alignment with EU standards, essential for the nation’s broader goals of integration and regional stability.

Chapter 15 of the Acquis, titled “Energy,” is a component of Cluster 4, known as the “Green agenda and sustainable connectivity,” in the accession process of Serbia to the EU (it is essential for candidate countries to embrace and put into practice the Acquis before they become EU members⁶). As of December 2021, Chapter 15 has been opened as a segment of the negotiation process for Serbia. According to the annual European Commission Reports, the status of Chapter 15 has been categorized as “Moderately prepared” since 2015. Prior to that, it was designated as “Further efforts needed” from 2010 to 2015. The energy-related challenges that Serbia encounters on its path toward EU membership are linked to enhancing supply diversification and security, primarily by striving to attain two pivotal objectives: energy efficiency and increasing the share of renewable energy sources by 20%. These obligations stem from Serbia’s commitment through the Agreement on the Establishment of the Energy Community, which requires the implementation of EU Directives pertaining to renewable energy sources. The EU is Serbia’s principal trading partner allowing access to its preaccession funds.

The Serbian national company responsible for oil and gas extraction, known as NIS (“Naftna Industrija Srbije” in Serbian), has been under the ownership of the Russian company Gazprom since 2009. This ownership extends to Serbia’s refineries as well (Radukić et al., 2023). Initially, Gazprom acquired a 51% stake in NIS for 400 million euros without a tender, with the Republic of Serbia holding the remaining 49%. However, with the purchase of an additional 5.15% in 2011, Gazprom now holds a total share of 56.15%. NIS possesses the right to exploit

its oil and gas reserves, while currently, the mining rent in Serbia is set at 3%, but it is anticipated to rise to 7% in the near future (in contrast, Russia maintains a mining rent rate of 22%). Nonetheless, Serbia benefits from a reduced price on imported Russian natural gas, which helps alleviate the burden on its import expenditure, preventing it from posing a significant strain on the country's economy. NIS's ownership matters for Serbia's EU accession and energy security because it affects the alignment with EU governance standards and plays a crucial role in ensuring the country's energy security and compliance with EU requirements knowing that the EU directives protect internal market in the first place (Brkić and Praks, 2020).

As Serbia progresses on its EU accession path, it may face challenges related to modernizing its energy infrastructure, promoting renewable energy sources, and ensuring energy security, all while meeting stringent EU standards and fostering sustainable development in the sector.

Natural gas

Serbia is a net importer of gas, with imports amounting to at least 2 bcm⁷, whereas domestic production falls below 0.5 bcm. The country's total annual gas requirements stand at approximately 2.7 bcm or more. Over the period from 2009 to 2019, Serbia has been on an average dependency of 74% on gas imports from Russia. As Serbia progresses toward EU membership, it is obligated to diversify its energy sources where most critical is imported natural gas that is practically currently solely reliant on Russia. Around 335 thousand households use gas in Serbia.

Concerning natural gas, Serbia has separated the responsibilities and ownership rights related to the transportation, distribution, and storage systems. This approach is now aligned with the requirements outlined in Chapter 15 of the Acquis "Energy." Certain deficiencies can be noted, not just in the natural gas sector but across the entire energy industry when it comes to effectively implementing these provisions in practice. Specifically, there is a requirement for further enhancement of the regulatory framework, particularly in terms of strengthening current institutional and administrative capabilities and improving communication among institutions at both the local and state levels. The EU has identified a significant concern within Serbian energy policy due to the substantial reliance on Russian gas, amounting to 89% in 2021 (Martin-Valmayor et al., 2023). However, there are plans to partially address this issue in the near future by utilizing preaccession funds; Serbia is on track to complete a gas interconnector with Bulgaria, a development that will contribute to diversifying its energy supply.

Serbia is not categorized as one of the unfriendly countries by Russia, and consequently, it is not obligated to make payments for import of natural gas in rubles.

Ownership and organizational structure. A state monopoly persists in the gas sector within Serbia. "Srbijagas," the state-owned company remains the sole entity responsible for natural gas transportation. On the other hand, the sole underground gas storage facility in Serbia, situated in Banatski Dvor, is jointly owned by the Russian Gazprom with a 56.15% stake and the Republic of Serbia with a 43.85% stake. Gas exploitation falls under the purview of NIS, the national oil and gas company. Gas distribution to households is divided among several smaller companies across the country while presently, there are 31 such companies in operation. However, consumers do not have the option to choose among them because these companies are regionally distributed, with only one company serving as the exclusive operator in a particular settlement.

Diversification of supply. In the past, Serbia had an agreement with Russia to build the South Stream pipeline. One branch of this project was intended to transport Russian gas through the Black Sea,

Bulgaria, Serbia, and onward to the European market (Brkić, 2008). However, the project was ultimately canceled in 2014. Simultaneously, the competitive Nabucco project, which aimed to transport gas from the Middle East through Bulgaria and Romania, bypassing Serbia, has never been constructed. Nevertheless, the South Stream project was succeeded by the Turkish Stream project (Baghirov, 2015), and presently, Russian gas is delivered to Serbia via Bulgaria through its subsidiary pipeline known as the Balkan Stream. The abandoned South Stream project aimed to establish a direct connection between Russia and Bulgaria via the Black Sea while in contrast, the Turkish Stream connects Russia to Turkey, partially utilizing the originally planned route through the Black Sea and then transitioning to a land route from Turkey to Bulgaria. The Turkish Stream consists of two parallel pipelines with a combined annual capacity of 31.5 bcm, while the Balkan Stream has an annual capacity of approximately 15.75 bcm. Gas delivery to Serbia through the Balkan Stream commenced in early 2021, with half of the Turkish Stream's capacity allocated for the Turkish market and the other half designated for the Balkan Stream. Previously, the primary route for supplying Serbia with Russian gas followed a different path, passing through Ukraine and Hungary. Additionally, to circumvent the previous Ukrainian route, Russian gas has been exported to Hungary from Serbia since October 2021 through a pipeline with a total annual delivery capacity of 8.5 bcm.

Furthermore, the EU has provided funding for the construction of the Bulgaria–Serbia gas interconnector, currently in the process of being built. This interconnector will offer an alternative to Russian gas. It is designed with a capacity of 1.8 bcm, which is approximately 60% of Serbia's total annual gas consumption. It will transport Liquid Natural Gas (LNG) brought in by ships from various sources to ports in Greece and Turkey, as well as natural gas from the Caspian Sea region, most likely from Azerbaijan, through Turkish pipelines. Full operational capability is anticipated to be achieved by the end of 2023.

Security measures to guard against possible sabotage of gas pipelines in Serbia have been significantly heightened following the recent incidents involving the Nord Stream 1 and 2 pipelines in 2022 (these pipelines were used to transport natural gas from Russia to Germany via the Baltic Sea).

Underground storages. Serbia has one underground gas storage facility the Banatski Dvor depleted gas reservoir, with a 51% share of the Russian Gazprom. The total capacity is up to 750 mcm⁸ while the withdrawal daily capacity is up to 10 mcm. Serbia's daily gas consumption typically ranges from approximately 10 to 11 mcm, with occasional peaks reaching up to 17 mcm per day. Recently, Serbia reached an agreement with Hungary to utilize 500 mcm of gas storage capacity within Hungary's underground storage facilities, in addition to Serbia's domestic storage capacity at Banatski Dvor. Due to the volatile situation arising from the Russia–Ukraine conflict, Serbia initially had access to a limited daily withdrawal of 3 mcm from Hungarian storage facilities between November 2022 and February 2023. This daily withdrawal limit was subsequently increased to 6 mcm in October 2022 and March 2023, with the agreement with Hungary remaining in effect for the foreseeable future.

The ownership structure of the underground gas storage facility Banatski Dvor, with Gazprom holding a majority stake, has significant implications for Serbia's gas supply and security, potentially affecting both the nation's energy ties with the EU and its reliance on a single major supplier.

Price. Until recently, Serbia had a contract with the Russian Federation for natural gas at a rate of US\$270 per 1000 m³. However, when the contract expired, a new agreement was reached recently that will be effective for the next three years. Under this new arrangement, the price of Russian-imported natural gas for Serbia will be determined based on a 100% oil-linked formula.

This means that when the price of oil is at its highest, Serbia will pay between US\$310 and US\$408 per thousand cubic meters for gas from Russia. Initially, there were concerns that the new formula would involve a 70% dependence on international market gas prices and a 30% dependence on crude oil prices. In the most optimistic scenario, it was anticipated that the formula would be 80% tied to crude oil prices and 20% to gas prices from the international market. However, the final agreement utilizing a 100% oil-linked formula implies that Serbia will pay one of the lowest gas prices in Europe, approximately 10–12 times less than what other European countries will pay. As part of this new deal, Russia will export 2.2 bcm of gas to Serbia over the next three years. It is expected that Serbia will require an additional 0.8 bcm, which will be procured from the free market. Notably, Russia has not included Serbia on the list of “foreign states that commit unfriendly actions as regards the Russian Federation and Russian legal and physical entities,” indicating that payment in rubles for imported gas is not mandatory. Bulgaria introduced in October 2023 an additional tax of around 10€ per megawatt-hour on Russian gas transfers which can reach even additional 100€ per thousand cubic meters (on the other hand, Bulgaria has not received any Russian gas since the end of April 2022, when refused to pay for it in rubles).

The Energy Agency of the Republic of Serbia regulates prices for both households and industries. Starting from October 2022, the price for natural gas used in households has been expressed in kilowatt-hours (kWh), whereas previously, it was measured in cubic meters. The actual price for households in August 2023 is 4.59 RSD/kWh⁹ without tax (value-added tax for gas is 10%) with an additional fixed amount of 1984.39 RSD/kWh¹⁰. Conversion is $1 \text{ m}^3 = 10.26 \text{ kWh}$, while it was believed before October that the value is 9.3–9.5 kWh which gives that the price is higher for 10.7% only based on conversion. Cumulatively, the price of gas for the population and the economy will increase around 64% from August 2022 to May 2024 (approximately: by 11% in January 2023, by additional 10% in May 2023, by another 10% in November 2023 and finally by 10% in May 2024, etc.). The price for industry is different but follows relatively similar dynamics.

Transitioning to measuring gas consumption in kilowatt-hours can lead to more precise billing and potentially encourage energy efficiency among consumers, especially in direct comparisons with the prices of electricity.

Crude oil

Historically, Serbia has been a modest producer of crude oil, with its own domestic oil fields, but it has increasingly relied on imports to meet its energy demands. The crude oil production from oil fields in Serbia amounts to approximately 23.15 thousand barrels¹¹ per day. Crude oil consumption in Serbia exceeds 74 thousand barrels per day, according to data from 2016. This represents only about 50% of the consumption levels observed in 1990, primarily due to the substitution of liquid fuels with natural gas to meet household heating demands. The country’s crude oil production has been relatively stable over the years, but consumption has risen, driven by economic growth and industrial development. Between 2009 and 2019, Serbia maintained an average dependency of 46% on crude oil imports from Russia. In 2021, the breakdown of imported crude oil sources was as follows: Iraq at 64%, Russia at 23%, Kazakhstan at 10%, and Norway at 3%. The peak of Russian oil imports occurred in 2008. Domestic production accounts for roughly 20% of the total crude oil consumption in Serbia.

However, the EU has imposed restrictions on the maritime transport of Russian crude oil since December 2022, along with the distribution of petroleum products to third countries from March 2023. As a third country, Serbia is affected by these restrictions. Until recently, Serbia imported

crude oil from Russia through an old ex-Yugoslav oil pipeline that extended from the Adriatic Sea coast via Croatia (JANAF—Jadranski Naftovod), with the crude oil being transported by tankers from Russia. As this mode of transport is prohibited by the EU, Serbia has engaged in negotiations to construct a pipeline connecting with the pipeline in Hungary, which would enable access to Russian crude oil transported entirely by land (Družba is known also in English as Friendship pipeline). The estimated cost of this 128-km-long oil pipeline is approximately 100 million euros, and the construction is expected to take about two years. In the interim, crude oil will be sourced from other providers on the market. The pipeline project connecting Serbia to the Družba pipeline in Hungary represents a significant step forward in the region's energy infrastructure development. By integrating with the Družba pipeline, Serbia gains access to a wider network of crude oil supply, reducing its dependency on a single source and enhancing energy security. This project has the potential to reduce energy costs, increase supply reliability, and stimulate economic growth by fostering an environment conducive to foreign investment, thereby bolstering Serbia's overall energy sector and economic prospects. Additionally, it can contribute to the country's alignment with EU energy policies, which is crucial for its EU accession ambitions.

The EU restrictions on crude oil imports pose significant implications for Serbia, as they may disrupt the nation's access to key energy resources and potentially lead to increased energy costs. This not only challenges Serbia's energy security but also has economic repercussions, as higher energy prices can impact the competitiveness of its industries and overall economic stability, underscoring the critical interplay between energy security and economic resilience in the context of EU restrictions. In terms of economic impact, the crude oil sector has been a notable contributor to Serbia's GDP, with both domestic production and refining activities generating revenue and employment.

Since the onset of the Russia–Ukraine war, the price of vehicle fuel in Serbia has been subject to legal restrictions. The government now regulates these prices on a weekly basis through decrees. Specifically, the prices for unleaded gasoline 95 and diesel fuel are adjusted every Friday at 3 p.m. However, these prices do not strictly align with fluctuations in the international crude oil market. The pricing formula involves variables from “Platts Mediterranean product cargo assessments,” primarily based on FOB Med, Genova/Lavera.

Electricity

Serbia is usually self-sufficient in electrical energy and any disruptions or issues in this sector can have profound consequences on both the economy and the well-being of its citizens.

In 2022, Serbia encountered challenges in electricity production stemming from extended periods of drought and exceptionally unfavorable hydrological conditions, leading to reduced river inflows. In Serbia, hydropower typically contributes over one-third of the total electricity generation, and a notable reduction in hydropower output can result in a significant electricity supply deficit. Serbia has been considering the development of reversible hydroelectric plants to improve grid balancing. These plants can store excess energy during low-demand periods and generate electricity during peak demand, enhancing grid flexibility and stability. Additionally, there were complications arising from the notably poor quality of the coal extracted during that period, characterized by its damp, muddy, and sticky nature. This coal quality issue, partially attributed to inadequate management practices, resulted in significant technical difficulties in the electricity production process due to delays in overburden removal. One of the primary concerns related to these challenges is environmental protection (Ćorović et al., 2022; Klimenta et al., 2022). Serbia primarily relies on lignite coal for electricity production. Lignite is a low-quality, brownish-black

coal that contains a high moisture content and is typically less energy-dense than other types of coal. While Serbia has its own lignite coal reserves, they are often of poor quality, containing impurities that can impact the efficiency of power plants and increase environmental concerns. In addition to domestic lignite, Serbia may also import higher-quality coal, such as bituminous or sub-bituminous coal, to supplement its energy needs and improve the performance of some power plants. Lignite combustion also generates fine particulate pollutants and ash, which harm air quality and have health implications even in the capital of Serbia, Belgrade. In response to these issues, Serbia has made efforts to adopt environmental regulations and standards, in line with EU guidelines, aimed at reducing the environmental effects of coal-based power generation. These standards encompass emission limits, complying with them has proven difficult due to the subpar quality of domestic lignite, resulting in the need for expensive emissions control technologies and potentially impacting the energy sector's competitiveness.

The dynamic of the price is similar as for natural gas; by 8% in January 2023, by an additional 8% in May 2023, by another 8% in November 2023 and finally by 8% in May 2024. The average price for households was 11.33 RSD/kWh in December 2022¹² (including the cost of power, distribution, and taxes). In reality, there are green (<350 kWh), blue (>351 kWh and <1600 kWh) and red tariff (>1601 kWh) based on consumption to promote saving. The price is also lower during night. For industry based on 1 MWh consumption, the price was 12.17 RSD/kWh in December 2022. Electricity in Serbia is domestically produced, so very often it is used as an instrument to balance the effects of increased prices of liquid automotive fuel which otherwise would be a source of inflation and a burden for economy and citizens. Electricity prices in Serbia were generally lower than the average prices in many EU countries. Serbia benefited from its own energy sources, particularly coal and hydropower, which contributed to relatively lower electricity costs.

Conclusions

The key challenges that predominantly affect the energy sector in Serbia include:

1. EU Membership and territorial integrity: The ongoing Russia–Ukraine war has intensified political pressure on Serbia. Serbia finds itself in a delicate position as it seeks to maintain historical ties with Russia while also pursuing its EU accession ambitions. The conflict has intensified scrutiny of Serbia's foreign policy choices and its ability to balance between these two geopolitical forces, impacting its diplomatic and political landscape especially with respect to the sensitive issue of Kosovo.
2. Favorable gas prices, security and diversification of supply: Serbia continues to receive natural gas from Russia at a discounted rate bypassing Ukraine, transported via the Black Sea, Turkey, and Bulgaria. However, for the first time, diversification of natural gas imports will be achieved through a new gas interconnector with Bulgaria, funded by the EU. This interconnector will facilitate the import of gas from Azerbaijan or LNG from different sources through Turkish or Greek ports.
3. Reliable source for crude oil supply: The state maintains price controls on automotive fuels, including unleaded gasoline 95 and diesel, with weekly adjustments. The previous practice of importing Russian crude oil via maritime routes through Croatian ports is no longer possible due to the war. As an alternative, plans are in place to establish a new pipeline connection through Hungary, connecting to the Družba.
4. Uninterrupted domestic production of electricity: Electricity production in Serbia is self-sufficient to meet the country's needs. However, due to unexpected issues during the past

winter, which resulted from poor management, technical maintenance, and inadequate planning in coal mining, Serbia had to temporarily purchase electricity from the international market at elevated prices driven by the ongoing Russia–Ukraine war.

In the future, addressing the challenges in Serbia's energy sector will require a balance between security, sustainability, and economic stability. Recommendations may include diversifying energy sources and enhancing efficiency.

The ongoing war between Russia and Ukraine may continue to influence the Serbian energy sector by affecting supply chains and source costs. Serbia's future energy strategies will need to remain adaptable to geopolitical shifts while emphasizing sustainability and security.

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ORCID iD

Dejan Brkić  <https://orcid.org/0000-0002-2502-0601>

Notes

1. * In the Serbian Constitution referred to as the Autonomous Province of Kosovo and Metohija, but self-proclaimed as an “independent state.”
2. Environmental protests in Serbia is frequent nowadays—mostly against lithium mining (Stefanović et al., 2023), small hydro-power plants (Mišić and Obydenkova, 2022), etc.
3. Resolution 1244 (1999) on the situation relating Kosovo adopted by the Security Council at its 4011th meeting on 10 June 1999. Available online: [https://undocs.org/S/RES/1244\(1999\)](https://undocs.org/S/RES/1244(1999)) (accessed on 24 March 2023).
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5. Security Council resolution 757 (1992) on sanctions against Yugoslavia adopted by the Security Council 3082nd meeting on 30 May 1992. Available online: [https://undocs.org/S/RES/757\(1992\)](https://undocs.org/S/RES/757(1992)) (accessed on 25 March 2023).
6. The progress can be followed; Available online: https://neighbourhood-enlargement.ec.europa.eu/enlargement-policy/serbia_en (accessed on 3 November 2023).
7. bcm is billion cubic meters = 10^9 m³.
8. mcm is million cubic meters = 10^6 m³.
9. RSD is Republic of Serbia Dinar; $1\text{€}\approx 118\text{RSD}$.
10. Average gas price for households in Serbia in December 2022 was 0.039 US\$/kWh, while in the world in average is estimated to 0.118 US\$/kWh; Available online: https://www.globalpetrolprices.com/Serbia/natural_gas_prices/ (accessed on 18 August 2023).
11. 1 barrel \approx 159 liters.
12. 0.105 US\$/kWh for households and 0.113 US\$ for industry while the average in the world is 0.181 US\$/kWh for households and 0.189 US\$/kWh for industry; Available online: https://www.globalpetrolprices.com/Serbia/electricity_prices/ (accessed on 18 August 2023).

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