

Strategies for strengthening the role of BRICS in the global energy agenda

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Abstract. Our paper focuses on the strategies for strengthening the role of BRICS in the global energy agenda. In particular, it looks into the current issues of energy cooperation among BRICS nations with a focus on Russia's leading role in this process due to its vast energy resources and geopolitical influence, highlighting key partnerships, such as the Power of Siberia pipeline with China and nuclear power collaborations with India and South Africa. The research underscores the strategic significance of Russia's energy exports and infrastructure investments, which foster energy security and economic stability among BRICS members. In spite of geopolitical challenges, it becomes apparent that Russia's technological expertise and diplomatic engagement within BRICS drive collective efforts toward sustainable development. By integrating fossil fuels, renewable energy, and nuclear power, BRICS aims to counterbalance Western dominance, promoting a multipolar global order and altering the entrenched energy solutions worldwide. Our results might have some important and relevant implications for stakeholders and policymakers specializing in global energy policies as well as energy economics and policy matters.

1 Introduction

Energy cooperation among BRICS countries (represented by Brazil, Russia, India, China, South Africa, and, starting from 1st of January 2024, also Iran, Egypt, Ethiopia, and the United Arab Emirates) represents a strategic alliance aimed at leveraging mutual strengths to foster sustainable development [1]. This collaboration is particularly significant given the collective economic significance of these countries which account for over 40% of the world's population and about 30% of global GDP [2]. Within this framework, Russia stands out as a pivotal player due to its vast energy resources and geopolitical influence [3, 4].

In general terms, Russia's role in BRICS energy cooperation is primarily based on its abundant reserves of oil, natural gas, as well as coal. As one of the world's leading energy producers and exporters, Russia increasingly supplies substantial quantities of these resources to other BRICS members. This export capability has positioned Russia as an indispensable partner in addressing the growing energy needs of rapidly industrializing nations such as China and India [5]. The significance of Russia's involvement extends beyond

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[19]. It can be seen that through its extensive resource base, technological prowess in nuclear power generation, and active diplomatic engagement, Russia significantly shapes the landscape of energy cooperation among BRICS nations [20]. By doing so, it contributes not only to regional stability but also plays a critical role in steering collective efforts toward sustainable development on a global scale.

2 Energy policy and BRICS

As one of the world's leading producers and exporters of oil and natural gas, Russia makes significant influence over global energy markets. This influence is not merely economic but also deeply geopolitical. At the heart of Russia's energy policy is its vast hydrocarbon reserves. The country holds some of the largest natural gas reserves in the world and is a major exporter to Europe and Asia [21, 22]. The country's abundance in natural resources has some hurdles too, because a large part of its energy sector dates to Soviet times and needs modernization [23, 24].

The strategic use of these resources allows Russia to exert considerable leverage on countries dependent on its energy supplies. For instance, Europe's reliance on Russian gas has been a cornerstone of Russia's ability to project power within the continent. Pipeline projects such as Nord Stream 2 have been both a symbol and instrument of this influence, enabling direct supply routes that bypass traditional transit nations [25].

In recent years, however, Russia has increasingly turned its attention towards Asia, recognizing the potential for new markets, alliances, or the new concepts such as smart cities [26]. Energy cooperation with China has intensified significantly. Deals such as the Power of Siberia pipeline agreement underscore this shift. By diversifying its customer base away from Europe to include rapidly growing Asian economies such as China and India, Russia mitigates risks associated with over-reliance on any single market while simultaneously strengthening ties with fellow BRICS nations [27]. This pivot towards Asia aligns well with broader geopolitical trends. As Western economic sanctions have targeted various sectors of the Russian economy, Moscow has sought to bolster relationships that are less influenced by Western policies. Energy cooperation within BRICS serves this purpose effectively by fostering economic interdependence among member states while reducing vulnerability to external pressures [28].

Moreover, Russia's engagement in BRICS offers the country an avenue for collaborative technological advancement in energy sectors including nuclear power and renewable energy sources. Joint ventures and shared research initiatives enable member nations to pool resources for mutual benefit which represents a necessity in an era where sustainable development is increasingly prioritized globally. However, this complex web of relationships also comes with challenges. Balancing competing interests among major consumers like China and India requires diplomatic accuracy due to the fact each nation seeks favourable terms that reflect their own developmental needs without ceding too much ground strategically or economically. Thence, it needs to be stressed that Russia's energy policy is integral not just to its economic health but also as a tool for international diplomacy within BRICS and beyond. By leveraging its vast natural resources strategically through diversified partnership, particularly focusing eastward Russia enhances its geopolitical standing while contributing significantly to collective development goals among emerging economies. This multifaceted approach underscores how intertwined energy policies are with broader international relations dynamics in today's interconnected world.

3 Energy resources and relations within BRICS

The geopolitics of energy is a crucial lens through which to understand the intricate web of relationships among the BRICS countries [29]. Energy resources, both in terms of availability and distribution, play a pivotal role in shaping the diplomatic and economic interactions among these emerging powerhouses. At the centre of this dynamic lies Russia, a global energy giant with vast reserves of oil and natural gas. Russia's status as an energy superpower gives it significant leverage within BRICS. As already mentioned above, Russian vast Siberian oil fields and extensive network of pipelines allow it to be a primary supplier not only to Europe but increasingly to China and India. This dependency on Russian energy creates a strategic interdependence that influences broader geopolitical alignments. For instance, China's ambitious Belt and Road Initiative (BRI) includes substantial investments in Russian infrastructure aimed at securing stable energy supplies for its burgeoning economy. The Power of Siberia pipeline stands as a testament to this Sino-Russian cooperation, symbolizing their mutual reliance and shared strategic interests [30].

India's relationship with Russia is similarly underscored by energy needs. As one of the world's fastest-growing economies with an insatiable demand for energy, India looks towards Russia for reliable supplies of crude oil and natural gas. The two nations have deepened their cooperation through agreements like Rosneft's acquisition stakes in Indian refineries which is a move that ensures long-term supply security while also cementing political ties [31].

While Brazil and South Africa are less dependent on Russian energy directly due to their own substantial reserves (Brazil in biofuels and offshore oil and South Africa in coal), they nonetheless benefit from intra-BRICS cooperation facilitated by Russia's role as an energy leader. For instance, Brazil's Petrobras has engaged with Russian firms for technology exchange related to deep-water drilling which represents an area where Russia's expertise is well-regarded globally [32]. However, this intricate dance around energy resources does not come without its challenges. Geopolitical tensions outside BRICS influence internal dynamics significantly. Sanctions imposed on Russia by Western nations over various geopolitical issues have ramifications within BRICS too forcing countries like India and China into delicate balancing acts between maintaining good relations with both Moscow and Washington [33]. Moreover, environmental concerns loom large over these relationships as global pressure mounts towards sustainable development goals. While fossil fuels dominate current exchanges, there is growing collaboration within BRICS on renewable energies, a field where each member brings unique strengths that could potentially reduce dependency on traditional hydrocarbons over time.

Overall, the geopolitics of energy among BRICS nations reveals a complex interplay where cooperation often dovetails into competition; mutual benefits coexist alongside strategic manoeuvring; traditional alliances are tested against new realities—all underpinned by the omnipresent need for secure, reliable sources of power essential for sustained development.

4 Russia's partnerships in energy markets within BRICS

The BRICS nations represent a significant portion of the world's population and economic activity. Within this consortium, energy cooperation has emerged as a critical facet for mutual development. Russia, with its vast reserves of natural gas and oil, plays a pivotal role in these dynamics.

Exploring Russia's partnerships in energy markets within the BRICS framework reveals a complex interplay of geopolitical strategy, economic necessity, and technological collaboration [34]. As already outlined before in this paper, Russia's boasts one of the largest energy sectors in the world. The country holds some of the globe's most extensive natural gas

reserves and is one of its leading oil producers. This wealth of resources positions Russia as an indispensable player in global energy markets and offers substantial opportunities for collaboration within BRICS.

Figure 2 below shows the examples of Russian energy partnership within BRICS format focusing on its four major players (China, Brazil, India, and South Africa).

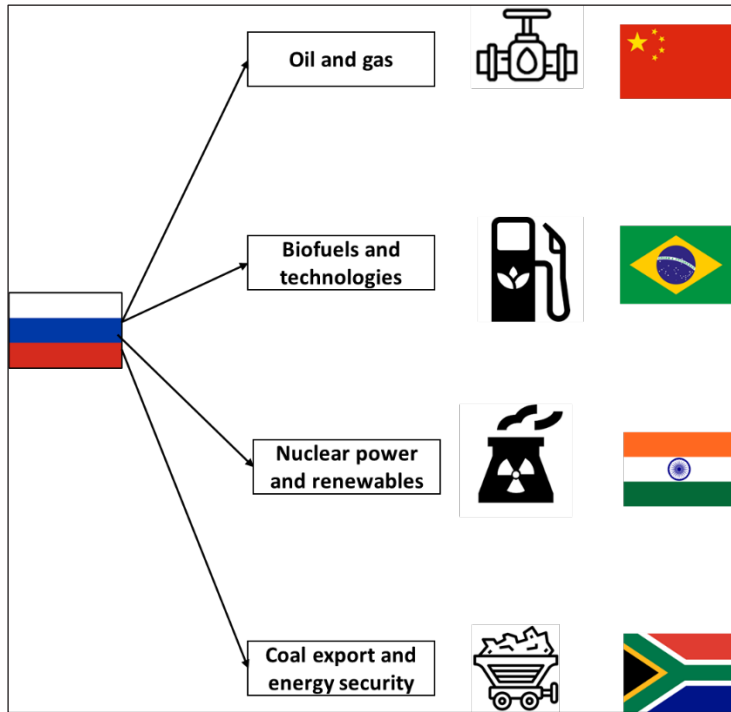


Fig. 2. Examples of Russian energy partnership in BRICS.

One notable aspect of Russia's partnership within BRICS is its relationship with China. Energy cooperation between these two giants has seen significant advancements over recent years. The Power of Siberia pipeline stands as a testament to this burgeoning partnership. Inaugurated in December 2019, this massive infrastructure project channels Russian natural gas to China's northeastern province which provides a clear indication of how energy ties are strengthening broader economic and political relations between Moscow and Beijing [35]. Beyond infrastructure projects like pipelines, joint ventures in technology transfer also characterize the Russo-Chinese energy relationship. Both countries are investing heavily in renewable energies such as wind power and solar technology, the areas where they can combine Russian scientific expertise with Chinese manufacturing capabilities to produce cost-effective solutions for sustainable development [36].

India represents another crucial partner for Russia within BRICS concerning energy cooperation. Historically reliant on Middle Eastern oil supplies, India has been diversifying its sources to enhance its energy security—a strategy that includes increasing imports from Russia. Additionally, nuclear power cooperation between Moscow and New Delhi exemplifies another dimension where their partnership flourishes. The Kudankulam Nuclear Power Plant project highlights how Russian expertise aids India's quest to expand its clean energy portfolio amidst growing environmental concerns [37]. South Africa provides yet another layer to understand Russia's multifaceted approach within BRICS' energy framework. Joint ventures focusing on mining resources essential for renewable technologies underscore this partnership's strategic importance. Lastly, Brazil emerges as a focal point for

expanding Russian interests beyond traditional hydrocarbons into biofuel which represents a sector where Brazil excels globally due to its advanced ethanol production capabilities derived from sugarcane.

4.1 Russia and China: cross-border energy markets through pipeline diplomacy

The strategic partnership between Russia and China in the energy sector represents a cornerstone of their broader bilateral relations, embodying a form of "pipeline diplomacy" that reshapes regional energy dynamics. This collaboration is not merely transactional; it is deeply embedded in the geopolitical and economic frameworks of both nations, driven by mutual benefits and long-term strategic interests. Central to this partnership is the Power of Siberia pipeline, a monumental project that signifies the deepening ties between Moscow and Beijing. Launched in December 2019, this pipeline stretches over 2,000 kilometres from the gas fields of Eastern Siberia to Northeastern China. The inauguration marked a significant milestone, symbolizing a new era in Sino-Russian energy cooperation. Capable of delivering up to 38 billion cubic meters of natural gas annually by 2025, Power of Siberia underscores Russia's role as a reliable energy supplier while satisfying China's burgeoning energy needs [38]. This pipeline serves multiple strategic purposes. For Russia, it diversifies its export markets beyond Europe at a time when Western sanctions have strained relations with traditional partners. By pivoting towards Asia's largest economy, Russia secures a stable revenue stream and strengthens its geopolitical leverage in Eurasia. For China, securing diversified sources of natural gas is crucial for its energy security strategy. Given its rapid industrialization and urbanization processes, China's demand for cleaner energy sources has soared as it seeks to reduce coal dependency and combat severe air pollution.

Beyond mere supply routes, these pipelines symbolize an evolving political alliance underpinned by shared interests in counterbalancing Western influence. Both nations see this partnership as pivotal for fostering stability across Eurasia through infrastructural connectivity that extends beyond just pipelines to include railways and other forms of logistical networks. Moreover, cooperative ventures extend into upstream investments as well. Chinese companies have been increasingly involved in Russian oil fields through joint ventures like Rosneft's Vostok Oil project which aims to develop vast resources within Arctic regions [39]. These collaborations not only enhance resource extraction but also foster technological exchanges that benefit both parties' industrial capabilities. The impact extends further into multilateral frameworks where both countries advocate for greater BRICS cooperation on energy matters. Their joint initiatives set precedents within BRICS forums encouraging other member countries (e.g. Brazil, India, South Africa) to adopt similar collaborative approaches tailored to their regional contexts. In conclusion, Russia-China pipeline diplomacy exemplifies how bilateral efforts can transcend traditional trade relationships fostering deeper geopolitical alignments while addressing pressing economic needs such as energy security diversification and sustainable development goals.

4.2 Brazil-Russia partnership: biofuel developments and technological exchange

The Brazil-Russia partnership exemplifies a dynamic and multifaceted collaboration in the sphere of biofuel developments and technological exchange [40]. Both nations, with their unique resources and expertise, have found common ground in pioneering advancements that promise to transform the global energy landscape. Brazil, a global leader in biofuels, particularly ethanol derived from sugarcane, has long been at the forefront of renewable energy innovation. Its vast agricultural sector provides an abundant supply of biomass, which

is crucial for sustainable fuel production. In contrast, Russia's strength lies in its technological prowess and extensive experience in energy infrastructure. By merging these complementary strengths, Brazil and Russia are poised to make significant strides in biofuel technology. One notable aspect of this partnership is the collaborative research initiatives aimed at enhancing biofuel efficiency and sustainability. Brazilian research institutions such as Embrapa (Brazilian Agricultural Research Corporation) have teamed up with Russian counterparts like the Skolkovo Institute of Science and Technology to explore new methods for optimizing biofuel production processes.

These joint efforts focus on improving crop yields through advanced agricultural techniques and genetic engineering while minimizing environmental impacts. A cornerstone project within this collaboration is the development of second-generation biofuels. Unlike first-generation biofuels that rely on food crops like corn or sugarcane, second-generation alternatives utilize non-food biomass such as agricultural residues or dedicated energy crops. This shift not only mitigates competition with food supplies but also enhances carbon sequestration capabilities. Brazilian scientists bring their deep understanding of biomass conversion processes to the table, while Russian engineers contribute cutting-edge technologies for efficient extraction and processing. Technological exchange between Brazil and Russia extends beyond research laboratories into practical applications as well. Pilot projects have been established across both countries to test innovative technologies under real-world conditions. In Brazil's São Paulo state, known for its extensive sugarcane plantations, Russian-designed reactors are being utilized to convert bagasse—a byproduct of sugarcane processing—into high-value fuels like biodiesel and bio gasoline. Conversely, Brazil has exported its expertise in ethanol production facilities to Russia's agricultural regions where similar feedstocks can be harnessed effectively. This cross-pollination not only accelerates technological adoption but also fosters economic growth by creating new industries and job opportunities. Moreover, this bilateral cooperation has garnered support from governmental bodies committed to sustainable development goals. The Brazilian Ministry of Mines and Energy along with Russia's Ministry of Energy have signed multiple agreements facilitating joint ventures and investments aimed at scaling up these innovative solutions on a larger scale. In sum, the Brazil-Russia partnership epitomizes how international cooperation can propel forward-thinking initiatives that address pressing global challenges such as climate change and energy security through shared knowledge, resources, and most importantly, a unified vision for a sustainable future.

4.3 Russian-South African energy initiatives: coal exports and energy security

The energy relationship between Russia and South Africa has evolved into a nuanced partnership that underscores the strategic importance of coal exports and energy security for both nations. As two pivotal members of BRICS, their collaboration extends beyond mere economic transactions, delving into geopolitical and environmental considerations [41].

Historically, coal has been a cornerstone of South Africa's energy landscape. The country boasts abundant coal reserves, which have not only powered domestic industries but also served as a significant export commodity. However, the global shift towards cleaner energy alternatives has posed challenges to this traditional reliance on coal. It is within this context that Russia emerges as a crucial partner due to its vast experience in the energy sector and its technological advancements that provide South Africa with an opportunity to enhance its own capabilities in managing and optimizing coal resources. Russian companies have been very important in offering expertise on improving mining efficiencies and reducing the environmental impact of coal extraction. This technical collaboration aims to prolong the viability of South African coal while adhering to international environmental standards. Moreover, Russia's role transcends technical assistance; it also involves facilitating access to

new markets for South African coal. With Europe gradually reducing its dependency on fossil fuels, Russia's extensive network can help redirect South African exports towards emerging markets in Asia where demand remains robust [42]. This strategic redirection is not only vital for sustaining South Africa's economy but also for maintaining regional stability by ensuring uninterrupted revenue flows from one of its key sectors. Energy security forms another critical pillar of this bilateral relationship. Both nations share concerns over reliable energy supplies amid fluctuating global markets and political landscapes. By diversifying their sources and fostering mutual dependencies, Russia and South Africa aim to insulate themselves from external shocks. In this context, joint ventures in liquefied natural gas (LNG) projects represent a significant advancement. While traditionally reliant on coal, South Africa is exploring LNG as a cleaner alternative that could serve as a transitional fuel towards more sustainable energy sources like renewables. Russian expertise in LNG infrastructure development can be pivotal here offering technological know-how while securing long-term supply agreements that bolster both nations' energy security frameworks. Furthermore, these initiatives are embedded within broader geopolitical strategies that seek to fortify BRICS as an influential bloc capable of counterbalancing Western dominance in global affairs. Energy cooperation between Russia and South Africa thus symbolizes more than economic pragmatism and reflects an alignment of visions aimed at fostering multipolarity in international relations [43].

Thence, the Russian-South African partnership epitomizes how traditional sectors like coal can be re-envisioned within contemporary frameworks emphasizing sustainability and resilience. Through collaborative efforts focused on technological innovation, market diversification, and strategic alignment within BRICS, both countries are not merely navigating current challenges but actively shaping their future trajectories in the global energy landscape.

5 Conclusions

All in all, the 21st century has witnessed a paradigm shift in global energy dynamics, with emerging economies playing an increasingly pivotal role. Among these, the BRICS countries stand out for their significant contributions to the global energy market. Central to this narrative is Russia's collaboration with its fellow BRICS countries. As one of the world's largest producers of oil and natural gas, Russia's vast energy resources have made it a key player in global energy markets. This intrinsic advantage has fostered numerous collaborative ventures aimed at enhancing energy security and economic stability within the BRICS framework. The synergy between Russia and other BRICS countries can be traced back to shared strategic interests that transcend mere economic cooperation. At its core, this partnership seeks to create a multipolar world order that can balance Western dominance in global affairs. Energy collaboration serves as an effective instrument for achieving this broader geopolitical objective. By pooling their resources and technological expertise, these nations aim to mitigate vulnerabilities associated with dependence on Western markets and technologies. One of the most compelling aspects of Russia-BRICS energy collaboration is its multidimensional nature. It encompasses not only traditional hydrocarbons like oil and natural gas but also renewable energy sources such as wind, solar, and hydropower. This comprehensive approach ensures that the partnership remains resilient amid fluctuating market conditions and evolving environmental regulations. For instance, China's insatiable demand for energy has led to significant investments in Russian oil fields and natural gas projects like the Power of Siberia pipeline - a monumental undertaking that symbolizes Sino-Russian cooperation at its finest. Similarly, India's burgeoning economy necessitates a steady supply of crude oil and LNG, areas where Russian expertise proves invaluable. Beyond bilateral agreements on resource exchange and infrastructure development lies another

critical dimension: technological collaboration. Research initiatives focusing on advanced drilling techniques, sustainable extraction methods, and renewable energy technologies are flourishing between Russian institutions and their BRICS counterparts. These joint endeavours not only drive innovation but also ensure that best practices are shared across borders.

Furthermore, multilateral platforms such as the BRICS Energy Research Cooperation Platform provide an institutional framework for ongoing dialogue among member countries. These forums facilitate knowledge exchange on critical issues ranging from regulatory policies to climate change mitigation strategies. In essence, the robust energy collaboration between Russia and other BRICS nations epitomizes a mutually beneficial relationship grounded in shared goals of economic prosperity and geopolitical stability. As these partnerships evolve further through case studies detailed later in this text—ranging from large-scale infrastructural projects to cutting-edge research initiatives—they promise not just immediate gains but long-term benefits for all stakeholders involved. Thus, far-reaching collaborations underscore how intertwined their futures are when it comes to meeting both current needs for conventional fuels while transitioning towards more sustainable forms of energy production which is a testament indeed fuelling future growth through unity among giants on new frontiers

Overall, exploring Russia's partnerships within BRICS' energy markets elucidates an intricate web woven through shared interests and complementary strengths across various sector from fossil fuels to renewables and nuclear power. These collaborations not only bolster each nation's individual growth but also contribute collectively towards achieving greater regional stability and economic resilience amidst global uncertainties.

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