BRICS Energy Cooperation and Global Energy Governance*

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Abstract: Energy is one of the important areas where the BRICS countries can work together to achieve practical results. Multilateral strategic cooperation on energy governance policy among the BRICS countries has assumed increasing urgency, with their collective share in the global energy market – and hence their importance – rising. Cooperation has thus far been mostly bilateral. Meanwhile, the BRICS countries are paying more and more attention to promoting low-carbon economy and sustainable development. Challenges abound, not the least the need to address the inadequacies in the existing global energy governance structure, not sufficiently responsive to their development needs, to navigate disagreements with developed countries over issues concerning carbon emissions, and to deal with the pressure of rising financial risks on energy governance. This calls for a coordinated response and a multilateral strategy on energy security, scientific and technological cooperation, and financial and legal issues. Active participation by the BRICS countries in the development of new global energy governance rules is also essential. Strengthened multilateral cooperation among the BRICS countries and their participation in global energy governance will bring more development opportunities to all countries.

Keywords: BRICS, energy cooperation, energy governance, challenge, strategy

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The Brasilia Declaration of the 11th BRICS Summit highlights the key role of energy in promoting social and economic development and environmental protection, and welcomes cooperation in the field of energy among the five BRICS countries. The new trends and challenges in today's international energy landscape and global energy governance accentuate the necessity and urgency of strengthened strategic energy cooperation among the BRICS countries. The rise of new consumer groups, the increasing influence of state actors and concerns about climate change are three major trends that are interacting with one another and together posing challenges to the existing regulatory structure (Goldthau and Witte, 2010). The economic development of emerging economies is still inseparable from a large amount of energy consumption at this stage. The BRICS countries understand that effective cooperation contributes to energy security and the development of a low-carbon economy, in addition to efforts to improve the rules of global energy governance. What challenges will the BRICS countries encounter in this process? How do they pursue strategic energy cooperation and participate in global energy governance? These are issues worth pondering. This article attempts to take stock of the current situation and analyze challenges the BRICS countries face in energy cooperation and participation in global energy governance. Possible coping strategies are proposed.

I. Current BRICS Energy Cooperation and Governance

1. The collective share of the BRICS countries in the global energy market on the increase

The importance of the BRICS countries in the global energy market is increasing, given their huge energy supply and consumption. According to the International Energy Agency (IEA), the BRICS countries account for 36.4% of the world's primary energy supply, and this proportion will rise to 40%-50% in 2040. Compared with the Organization for Economic Cooperation and Development (OECD) countries, the BRICS countries increased their primary energy supply by 11.6% from 2000 to 2017. In the renewable energy sector, according to data released by the International Renewable Energy Agency (IREA) in 2019, the total installed capacity of renewable energy in emerging markets has grown by 161% over the past decade, accounting for 43.1% of the world total (Pan, 2019). In terms of energy consumption, China is the largest primary energy consumer in the world, using about 3.3 million tons of oil equivalent in 2018. All BRICS countries are on the list of the world's top 20 primary energy consumers in 2018, and China, India and Russia are among the top five (British Petroleum, 2019). A series of economic development parameters, especially rapid growth in energy demand and electricity

production, attest to the increasing importance of the BRICS countries in the world energy scene. The Russian Government Analysis Center predicts that by 2040 the BRICS countries will account for 45% of global energy consumption and production (SAIIA, 2019). The energy reserves of the BRICS countries cannot be ignored either. The oil reserves of the BRICS countries account for 8.7% of the world's total oil reserves, natural gas reserves account for 23.8%, and coal reserves account for 39.5% (British Petroleum, 2019). The rapid growth in energy production and consumption in the BRICS countries in recent years has highlighted the necessity of increased participation by the BRICS countries in global energy governance and cooperation, and increased their enthusiasm for participation.

2. BRICS energy cooperation now mainly bilateral

Due to their prominent position in the global energy market, cooperation among the BRICS countries on energy governance has attracted increasing attention. Bilateral energy cooperation is especially noteworthy. For example, an Indian natural gas company and Petrobras signed a cooperative exploration agreement in 2007; State Grid Corporation of China and South Africa's state-owned power company launched strategic cooperation in 2015 and invested in power station construction; energy cooperation has been ongoing between China and Russia, culminating in the commissioning of the China-Russia eastern natural gas pipeline in recent years. Their preference for bilateral cooperation is related to the difference between the way that the BRICS countries participate in global energy governance and the way that developed countries used to do. The five countries have different emphases on specific energy policies, but to a certain extent, they all show adherence to this path. This approach can be summed up as a move towards national autonomy and energy independence, rather than an effort to stick to market-oriented energy policies and the goal of deep integration into the global energy market (Taylor, 2018). There are three main reasons why the BRICS countries prefer this approach.

First, bilateral cooperation enables the BRICS countries to better achieve complementarity in production capacity and optimal allocation of resources. Other conditions being the same, the larger the economic landscape is, the more space it can provide for cooperation in efficient use of productive resources (Liu, 2017). The economies of the BRICS countries are impressive, though they possess different industrial advantages. They are endowed with different amounts of energy reserves. Bilateral cooperation gives them a handy tool to focus on particular areas of mutual interest and allow their strengths to

complement each other. The larger space that bilateral cooperation brings makes it easier for them to share what they have and get what they need.

Second, energy security remains a top priority for all BRICS countries. No country is immune to geopolitical risks. But the fact that they have different geopolitical and economic concerns, coupled with the sensitivity of energy issues, essentially renders any "one-stop" scheme for energy cooperation impractical, especially in view of the importance they attach to energy security and the emphasis they place on energy independence. On one level, the BRICS countries can be divided into two categories: energy-rich countries like Russia and Brazil, which are nonetheless often affected by international energy market volatility, resulting from geopolitical shocks or other black-swam events, making any attempt at maximizing the value of energy a futile task; and big energy consumers like China, India and South Africa, whose strategic considerations lead them to embrace the need for diversification and stability of energy supply sources. As a result, bilateral cooperation has emerged as a tool uniquely suited for advancing a country's strategic interests.

Finally, bilateral cooperation is believed to have the potential to reduce transaction costs to a certain extent, an advantage that cannot be envisaged through a multilateral mechanism, at least as it stands now. While the 2019 BRICS Summit declaration welcomes the approval of the Terms of Reference of the BRICS Energy Research Cooperation Platform, an important step towards greater cooperation, it should be noted that there has been no evidence of any follow-up implementation and the BRICS countries have yet to develop a program of action on their multilateral cooperation, or any constitutional documents for a cooperation mechanism or a governing body thereof (Ye, 2015). Although strengthening multilateral cooperation in energy is in the interests of the BRICS countries and also responds to the need for more international energy cooperation, the lack of an effective BRICS mechanism for this purpose has led the BRICS countries to turn to bilateral channels when they are seeking any cost reductions or efficiency gains.

3. BRICS energy governance model promoting low-carbon and sustainable development

Driven by economic growth, alongside different energy structures, developing economies as a group, represented by the BRICS countries, have emerged as major greenhouse gas emitters. In the face of a new wave of technological revolution,

coupled with the dual pressure of a world economic downturn and a growing climate crisis, the BRICS countries have to look beyond the need to maintain sustained and rapid economic growth as a pathway to greater comprehensive national strength, and embark on a process of structural transformation, so as to stay competitive in a changing world. Sustainability has been top-of-mind for the BRICS countries, which have been promoting the development of a low-carbon economy, especially in the following aspects.

First, the BRICS countries have set carbon emission reduction targets. They have rolled out policies on emission reduction and economic growth with specific emission reduction targets. For example, Brazil's 2009 plan aimed to reduce its baseline level of greenhouse gas emissions by 36.1%-38.9% in 2020; India's energy conservation law and its National Action Plan on Climate Change sought to reduce emissions by 20%-25% by 2020 compared with the 2005 level.

Second, the BRICS countries actively develop new energy and renewable energy. As emerging economies, the BRICS countries not only look at the pace of growth, but also increasingly integrate low-carbon initiatives into the ongoing process of economic transformation as part of the response to an unfolding new industrial revolution. Investment in renewable energy development has spiked in recent years. Brazil has been a leader in the development of bio-liquid fuels; Russia has prioritized nuclear energy as a new energy source; India, China and South Africa have focused on developing renewable energy sources, such as hydropower, wind power and solar power.

Third, energy efficiency improvements have been a priority, as an important means of controlling greenhouse gas emissions. Energy conservation and emission reduction measures are pursued in tandem with other measure to develop a circular economy and strengthen environmental protection. The move seeks to maximize synergies by coordinating efforts to address climate change and protect the environment and those intended to improve efficiency in energy production, transmission and conversion, and cut energy use, especially in energy-intensive industries.

This shared focus on sustainability and the development of a low-carbon economy stems from the fact that the BRICS countries are facing similar environmental challenges at both the national and international levels. Recognition of this need provides an important basis for energy cooperation.

II. Challenges Facing the BRICS Countries When They Seek Participation in Global Energy Governance

1. Existing global energy governance mechanisms not up to fulfilling the tasks of development

The concept of global energy governance was first proposed at the G8 summit in 2005. It gained attention amid concerns over energy security threatened by rising oil prices, the intensifying disputes between Russia and Ukraine over gas supplies, and worsening global warming. The goals that any global energy governance mechanism attempts to achieve include promoting economic development on the basis of stable energy supply and demand, strengthening international security, ensuring environmental sustainability, and promoting good domestic governance (Van de Graaf and Colgan, 2016). However, from the perspective of the BRICS countries, there are many inadequacies and constraints in the existing global energy governance mechanisms, which are not conducive to their development agendas.

First, there is too much fragmentation. As regards international energy governance, major institutions and agreements include the International Energy Agency (IEA), the International Energy Forum (IEF), the Organization of Petroleum Exporting Countries (OPEC), the International Partnership for Energy Efficiency Cooperation (IPEEC), the International Energy Charter (IEC), and the United Nations Framework Convention on Climate Change (UNFCCC), among others. Multilateral development banks and international financial institutions are also active players in this field. There is, however, insufficient coordination and collaboration among the various institutions and organizations, each of which focuses only on one aspect of energy governance. For example, the UNFCCC is primarily concerned about the impact of energy use on climate change and the environment, while the IEF facilitates open dialogue on energy. In the long run, it may even happen that one agency's policies undermine the effectiveness of another agency's policies (Meyer, 2013). The absence of a truly authoritative global governance organization or platform, where problems can be discussed and effectively addressed, makes it difficult for the BRICS countries to play a meaningful role as a group.

Second, the existing global energy governance mechanisms have failed to adapt to the changes in the energy market, leaving the BRICS countries with insufficient space to contribute to decision-making. A case in point is the IEA. The IEA was established in

1974 by some of the world's largest oil consumers at the time – the United States, Japan, and some European countries – in response to the oil crisis of the 1970s. Later, the IEA gradually stepped into other energy fields besides oil, and expanded its membership. Since it is open only to OECD countries, the BRICS countries are not its members, even though they are among the top energy consumers in the world. Similar anomalies exist to varying degrees in other energy governance institutions. This shows that the current global energy governance structure does not really reflect the changing balance of power in the global energy market, casting doubt on its legitimacy.

Third, the energy agenda the BRICS countries share is not fully compatible with the goals of the current global energy governance mechanisms. The BRICS countries emphasize energy security and national autonomy. When it comes to energy policy or energy cooperation, they are cautious about the model led by the IEA and other institutions. Besides, each of them has its own preferences and priorities, making it extremely difficult, at least for the time being, to come up with a clear, constructive and unified BRICS approach to reforming the existing global energy governance mechanisms. Currently, the BRICS countries prioritize technical cooperation, with a focus on new and renewable energy research and development. This does not lend itself well to "regime complexity" that characterizes today's global energy governance. On the other hand, if the BRICS countries as a group ponder a greater role in global energy governance in the future, they will have to work out a joint reform proposal that is in line with their actual role on the world stage and their interests. This is no doubt a huge challenge.

2. Disagreements with developed countries over carbon emissions

The issue of carbon emissions has always been integral to any discussion on energy cooperation and governance, and now it has moved to center stage. Despite any agreed targets and rules specified by the long-term comprehensive governance framework under the Kyoto Protocol, international negotiations on carbon emissions – a point of contention between developed and developing countries, including the BRICS countries, due to their divergent national interests and priorities – have long been a hard slog. Their dispute unfolds in the following aspects.

First, the differences between developed countries and developing countries represented by the BRICS countries on how to interpret the principle of "common but differentiated responsibilities" are widening. Many developed countries argue that carbon emission reduction is a common responsibility of all countries, and that developing countries

should not take less responsibility because of their lower levels of economic development. They claim that carbon emissions reduction targets should be based on the overall carbon footprint, and urge developing countries to implement simultaneous mandatory emission reduction measures. But from the standpoint of the BRICS and other developing countries, this doctrine not only evades the issue of equity and justice, but also fails to take into account actual carbon emission reduction capabilities of developing countries. Economic development and poverty reduction remain primary tasks of developing countries. These goals are difficult to achieve at this stage under the stringent carbon emission reduction conditions (Shan *et al.*, 2018). Poverty in developing countries is not unrelated to the early stages of industrialization and the economic takeoff of today's developed countries, and developing countries are still suffering from the impact of historical carbon emissions. Recognition of this inequity gives rise to the need for continued application of the principle of "common but differentiated responsibilities." Some advanced economies are now questioning the way developing countries are classified. It is argued that one of the main challenges of international cooperation is how to reconsider the traditional dividing line between developed and developing countries and establish an effective and fair system. Treating all developing countries as a single group is neither valid nor equivalent, as is the case in trade and climate change governance mechanisms (Pauwelyn, 2013). If the current division of developed and developing countries becomes a main issue, there is no doubt that the way the principle of "common but differentiated responsibilities" should be interpreted and applied will become more complicated.

Second, disputes have been ongoing between BRICS and developed countries over carbon emission reduction technology transfer and financial support. While developed countries possess advanced technologies that can be used to reduce emissions, they are reluctant to transfer these technologies or provide assistance to developing countries that lack capital and technology (Shan *et al.*, 2018). Although China, India and Brazil have presented specific proposals on, inter alia, intellectual property reform, differential pricing, and financial and technical support, developed countries have not responded positively. Successful climate governance requires direct assistance from developed countries to developing countries. Of course, it also requires a clear commitment from developing countries to implementing national measures that spur demand for environmental technologies. Ideally, developed and developing countries can reach a global pact that includes realistic carbon emissions targets, measures to promote the development of a global carbon market, and ways to help developing countries develop low-carbon technologies. It is also good idea to establish a new agency responsible for monitoring and evaluating progress in the implementation of emissions reduction

measures and advising on related issues. Unfortunately, reality is not so rosy. Cooperation never triumphs over competition. Studies show that the BRICS countries have done better than the Group of Seven (G7) countries in improving energy efficiency, and high emissions are recorded in some G7 members due to technological degradation (Chang, 2018). This has led developed countries to feel increasing competitive pressure from the BRICS countries. Technology transfer, provision of funds, and loosing of intellectual property rules directly involve vested interests of developed countries, and the room for concessions to developing countries is increasingly limited.

Finally, carbon leakage, a subject of the long-running dispute between developed and the BRICS countries, may feature more prominently in future discussions on emissions reduction responsibilities. Carbon leakage refers to the ratio between the increase in carbon dioxide emissions by countries and regions other than those taking environmental regulatory measures and the reduction in carbon dioxide emissions by countries and regions taking environmental regulatory measures. The controversy involved here is whether cross-border transfer of carbon emissions as a result of differences in emissions standards is considered carbon leakage, whether differences in policies will inevitably lead to an increase in carbon leakage, and who should be held responsible (Meng, 2017). The issue of carbon leakage is closely related to international trade, and differences in emission reduction policies among countries are the main reasons for carbon leakage. The dispute between developed and developing countries arises from different positions and viewpoints. Developed countries maintain that cross-border transfer of carbon emissions should also be considered carbon leakage, which takes place when businesses in developed countries move carbon-intensive activities to developing countries, and that developing countries have the responsibility to enforce comparably stringent emission reduction policies. Developing countries counter that developed countries ignore carbon leakage among developed countries, and that developing countries are victims of carbon leakage. Adding fuel to the fire is the possible introduction of the Border Tax Adjustments (BTAs) by developed economies such as the United States and the European Union in order to offset any loss of competitiveness resulting from stronger climate policies and to prevent carbon leakage. Most countries and many international organizations have misgivings about these unilateral measures, and their effectiveness in preventing carbon leakage is dubious. They are seen as essentially a protectionist gimmick employed by developed countries to shore up sagging competitiveness of their traditional industries to fend off competition from developing countries. Some BRICS countries are set to bear the brunt of these measures.

3. Energy-related financial risks

Energy-related financial risks the BRICS countries face are on the rise. It is clear that these risks lurk in carbon trading mechanisms and renewable energy investment. As it is currently envisaged, carbon trading can be rife with hidden dangers that may threaten the economic security of the BRICS countries. Although the European Union and other developed economies have been actively promoting carbon trading, it has yet to spur enthusiasm among developing countries, where its role remains limited. The lack of popularity is mainly related to high costs of green technology research and development and long payback periods of investments. Despite their generally superior financial strength, developed economies are not immune to possible disruptions wrought by carbon speculation. Lured by any perceived profit potential, arbitrage traders and speculators may move in, possibly wreaking havoc and causing carbon market crashes. This possibility presents a big challenge for the BRICS countries, whose financial regulatory mechanisms remain relatively weak.

In terms of renewable energy investment, the BRICS countries also face risks. They have attached great importance to and invested heavily in the development of renewable energy sources in recent years. Renewable energy investments consist mainly of low-interest loans provided by banks and development institutions, though industry funding also plays an important role. Committed to a transition to renewable energy, the governments of the BRICS countries have rolled out incentives that have proven effective, including special funds to support research and development projects, and subsidies to businesses engaged in renewable energy development and consumers of renewable energy. Some renewable energy companies in China have succeeded in raising significant amounts of capital through public offerings or bond issuance. Venture capital and private equity investment in renewable energy has also picked up steam in China, India and Brazil. All five BRICS countries seek capital internationally, including from foreign governments, international banks, and foreign private investors (Zeng *et al.*, 2017). Financing, however, remains a challenge for the BRICS countries. Lack of funds that plagues many small and medium-size enterprises, reliance on foreign capital, and inadequacies in government policies can potentially jeopardize a smooth transition to renewable energy.

III. Strategies that the BRICS Countries Can Rely on to Address Energy Cooperation and Governance Challenges

In the context of today's global political and economic realities, strengthening multilateral strategic cooperation in the field of energy among the BRICS countries based on their

complementary strengths has assumed added importance. It is time that they worked together to improve rules governing multilateral energy governance. The following are five areas of focus.

First, energy security underpins any BRICS strategic energy cooperation. Some BRICS countries are highly dependent on external energy supply. China's dependence on foreign oil increased from 23% in the early 2000s to 58% in 2012. India and South Africa depend on imports for about 80% and 67% respectively of their oil needs. Unlike China, India and South Africa, Russia and Brazil are major energy exporters, and energy exports are the backbone of their national economies. For any BRICS energy cooperation to be meaningful, it is important to focus on long-term interests, mutual trust and mutual accommodation, and respond to the development needs of all parties. More dialogue helps strengthen political mutual trust, and identify ways to build effective energy security mechanisms. For China, the importance of energy security is self-evident. As other BRICS countries can be China's potential competitors and/or strategic partners, an important challenge is how to strike a right balance and find win-win solutions. Market dynamics unmistakably point to the possibility of meaningful cooperation that benefits all BRICS countries. A symbiotic relationship can emerge with energy-abundant Russia and Brazil providing a stable supply under a preferential arrangement to the three energy importers, which can then rely more on their BRICS partners for oil imports.

Second, scientific and technological cooperation among the BRICS countries in the field of energy has great potential. It is key to staying competitive in the global energy market. The BRICS countries have rich and diverse natural resources and technological expertise, and are well-placed to promote global energy cooperation through technological innovation. There are promising options they can explore to leverage their complementary strengths in, among other fields, renewable energy development, energy efficiency improvements, research and development, and financing. For example, South Africa, the only country in Africa with nuclear power plants, and China, the country with the world's largest nuclear power construction program, can strengthen cooperation in the field of nuclear energy. In their Delhi Declaration issued at the 4th BRICS Summit in 2012, the BRICS countries affirmed their intention to promote clean and renewable energy development, energy efficiency and alternative technologies, and exchanges on expertise, skills and technologies in the field of clean and renewable energy. Scientific and technological advances in the energy industry help improve energy efficiency and reduce carbon footprint. Especially for China, it is extremely important to promote scientific and technological development in the field of energy, and embrace emerging

energy technologies that come with the advent of the fourth technological revolution. Only by becoming a leader of the fourth technological revolution will China have the opportunity to break through the energy bottleneck and have its say in this field (Zhao *et al.*, 2017). More investment in BRICS cooperation project for scientific and technological development in the field of energy and a more active leading role in this regard serve China's strategic goals.

Third, effective implementation of energy strategies requires cooperation on financing for energy projects. The New Development Bank (NDB), established in 2014, plays an important role in this connection. A key aspect of the NDB's work is to set energy targets for the BRICS countries, and provide sustainable and reliable investments that enable the countries to increase their capacity for renewable energy development. The NDB sets targets specific to each BRICS country, taking into account the country's plans and existing levels of renewable energy use. It is able to provide in an expeditious manner flexible lending solutions that help the countries meet these targets. At the same time, the NDB has increased investment in energy development and oil and gas pipeline construction. It is also necessary for the BRICS countries to further promote synergy between their own energy industry and the capital markets, and build a BRICS energy order (Yan, 2014) in their joint effort to deal with climate change. A move in this direction offers a fresh opportunity to strengthen cooperation on energy financing. As the impact of carbon dioxide emissions on climate has increasingly become a global issue, which commands the attention of all countries, a rush is underway to develop renewable energy sources, creating an urgency for financing needs. In view of the fact that the development of renewable energy technologies, including energy storage solutions, requires significant financing, including long-term loans, as well as legal and institutional support from the national governments, joint efforts by the BRICS countries are essential to building a mechanism for strategic cooperation that coordinates research, development and promotion of renewable energy technologies.

Fourth, effective strategic cooperation in the field of energy among the BRICS countries is not possible without a strong legal framework that responds to the energy needs of the BRICS countries, and provides an institutional basis for results-oriented cooperation among the BRICS countries on energy innovation. Energy cooperation is essentially the pursuit of common interests, and to achieve this goal requires cooperation. A legal framework for energy cooperation is indispensable to resolving any potential conflicts and disputes arising from cooperative efforts and ensuring that cooperation leads to win-win results. This legal framework will guide the functioning of agencies to be established

for the purpose of energy cooperation among the BRICS countries by consensus through negotiation, which, if all goes well, leads to the signing of multilateral treaties on energy cooperation. The framework will consist of a series of rules and regulations, derived from domestic rules and regulations, multilateral treaties, and bilateral treaties, that the BRICS countries must abide by in their interaction with each other (Yue, 2014). There are still many gaps in the existing legal landscape. More work needs to be done to improve each country's domestic legal system. The BRICS countries can also work towards multilateral agreements on energy cooperation, and the eventual establishment of specialized agencies to handle related legal affairs. Legal experts from the BRICS countries agree that greater legal integration is conducive to energy cooperation. To facilitate direct energy trade, priority should be given to addressing the differences in the civil laws of various countries, as these laws regulate direct transactions between private parties and foreign businesses. Direct trade requires legal coordination. Establishing legal mechanisms for energy cooperation, however, involves important issues of national sovereignty. Even if harmonization of the laws on energy cooperation is possible, countries need to surrender part of their sovereignty. That is something not easy to accomplish at present. But this difficulty does not obliviate the need to work together towards a possible breakthrough in this direction that eventually leads to greater legal integration.

Fifth, active participation in global energy governance is essential to improving international energy rules. Despite daunting challenges, the BRICS countries as a group will have a lot to gain by playing a bigger role in the global energy scene. A clear common goal can inspire action. Studies show that cohesion improves whenever the BRICS countries jointly identify a moderate and revisionist goal, leading to better results in negotiations. Lack of a clear goal, however, often leads the BRICS countries to abandon alliance behavior. Unless the five countries can have a coherent strategy to restrain their respective forces, the BRICS countries' calculations based on their own interests will undermine common geopolitical action (Brutsch and Papa, 2013). Greater unity allows the BRICS countries to move ahead, build a common identity, work out an energy cooperation strategy based on shared interests and in line with shared values, and more effectively participate in global energy governance. It can also help kick off a gradual transition from "rule takers" to "rule makers" in global energy governance processes, ready to address any inadequacies in the existing mechanisms. Strengthened coordination calls for the establishment of a special agency for this purpose, which can also work in collaboration with other international organizations or arrangements in promoting international cooperation. Strengthened bilateral and multilateral energy

cooperation among the BRICS countries at multiple levels and through multiple channels holds the promise of making a difference in the global energy governance mechanisms and advancing equity for emerging economies in international rulemaking.

IV. Conclusions

This paper highlights the current dilemmas and challenges the BRICS countries face in energy cooperation and participation in global energy governance. The needs for strategic energy cooperation among the BRICS countries have never been more urgent. A narrow focus on bilateral cooperation does not do justice to the clout the BRICS countries as a group have in the energy market. Awareness of this inadequacy has prompted the BRICS countries to seek more multilateral cooperation, including in promoting low-carbon and sustainable development. However, participation of the BRICS countries in global energy governance faces many challenges. As currently configured, the existing global energy mechanisms do not favor increased BRICS participation. Disputes with developed countries over the issue of carbon emissions have been ongoing. The energy sector is also facing rising financial risks. Strengthened cooperation among the BRICS countries in the fields of energy security, science and technology, finance and law will allow them to better complement each other's strengths, and be better able to contribute to improving global energy governance rules. A move in this direction that eventually leads to the creation of a BRICS energy governance structure represents a best opportunity for the BRICS countries to work together to tackle energy challenges.

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References

- British Petroleum (2019). *BP Statistical Review of World Energy 2019*. London: BP p.l.c.

- Brutsch, Christian and Mihaela Papa (2013). Deconstructing the BRICS: Bargaining Coalition, Imagined Community, or Geopolitical Fad? *The Chinese Journal of International Politics*. vol. 6, pp. 299-327.

- Chang, Mingchung, Hu Jinli and Chang Hengchu (2018). Resource Efficiency and Productivity Changes in the G7 and BRICS Nations. *Polish Journal of Environmental Studies*. vol. 27, no. 6, pp. 2463-2474.

- Goldthau, Andreas and Jan Martin Witte (2010). *Global Energy Governance: The New Rules of the Game*. Washington DC: Brookings Institution Press.

- Liu, Shuguang (2017). Macroeconomic Basis and Complementary Advantages of BRICS Production Capacity Cooperation (金砖国家产能合作的宏观经济基础和互补优势探析). *Theory Journal* (《理论学刊》). no. 6, pp. 62-70.

- Meng, Guobi (2017). Carbon Leakage: Rules Game and Strategic Thinking between Developed and Developing Countries (碳泄漏：发达国家与发展中国家的规则博弈与战略思考). *Contemporary Law Review* (《当代法学》). no. 4, pp. 38-49.

- Meyer, Timothy (2013). The Architecture of International Energy Governance. *UGA Legal Studies Research Paper*. no. 13, [Accessed online at https://ssrn.com/abstract=2240412. March 1, 2020].

- Pan, Zhaoyi (2019). Data tells: Why should BRICS countries cooperate on energy? [Accessed online at https://news.cgtn.com/news/2019-11-09/Data-tells-Whyshould-BRICS-countries-cooperate-on-energy--Ls9iBCpUWs/index.html. February 27, 2020].

- Pauwelyn, Joost (2013). The End of Differential Treatment for Developing Countries? Lessons from the Trade and Climate Change Regimes. *Review of European Community & International Environmental Law*. vol. 22, no. 1, pp. 29-41.

- SAIIA: The South African Institute of International Affairs (2019). BRICS energy cooperation: Why Russia and South Africa still need each other. [Accessed online at https://saiia.org.za/research/brics-energycooperation-why-russia-and-south-africa-stillneed-each-other. February 27, 2020].

- Shan, Liangyan, He Haiyan and Zhang Hanfei (2018). The Origin, Predicament and Outlet of International Carbon Emission Game (国际碳排放博弈的根源、困境和出路). *Social Sciences in Yunnan* (《云南社会科学》). no. 2, pp. 123-129.

- Taylor, Monique (2018). A BRICS Approach to Energy Cooperation: Implications for Global Energy Governance. *ESI Policy Brief*. no. 24, pp. 1-4.

- Van de Graaf, Thijs and Jeff Colgan (2016). Global Energy Governance: A Review and Research Agenda. *Palgrave Communications*. vol. 2, no. 1, pp. 1-12.

- Yan, Shigang (2014). Current Situation, Problems and Countermeasures of BRICS Energy Cooperation (金砖国家能源合作现状、问题与对策). *Journal of International Economic Cooperation* (《国际经济合作》). no. 9，pp. 50-54.

- Ye, Jianmei (2015). Problems and Paths of BRICS Energy Cooperation (金砖国家能源合作的问题与路径), *Chinese Journal of Law* (《法学研究》). no. 2, pp. 105-106.

- Yue, Shumei (2014). Legal Mechanism Construction of BRICS Energy Cooperation (金砖国家能源合作的法律机制构建). *Legal Science.* no. 2, pp. 92-100.

- Zeng, Shihong, Liu Yuchen, Liu Chao and Nan Xin (2017). A Review of Renewable Energy Investment in the BRICS Countries: History, Models, Problems and Solutions. *Renewable and Sustainable Energy Reviews*. no. 74, pp. 860-872.

- Zhao, Xinli, Li Minrong, Huang Maoxing and Alexander Sokolov (2017). BRICS Innovation Competitiveness Report 2017. [Accessed online at https://www.ranepa.ru/eng/images/CIIR/BRICS/BRICS%20Innovative%20Competitiveness%20Report%202017.pdf. April 11, 2020].