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International Relations and Energy Security: Challenges and Opportunities

Yusran (yusran@budiluhur.ac.id)
Universitas Budi Luhur

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Abstract

This study aims to analyze the dynamics of international relations in the context of energy security, with a focus on the challenges and opportunities that arise in the current era of globalization and energy transition. Energy security is not only a domestic issue, but has developed into one of the important pillars in international politics that affects global economic, political, and security stability. The research method used is a qualitative approach with a descriptive method. international relations play an important role in supporting the creation of global energy security, both through opportunities such as cooperation in the development of renewable energy, foreign investment, technology transfer, and increasing regional stability. However, this study also found significant challenges in the form of differences in national interests, inequality in access to resources and technology, issues of state sovereignty, and regulatory complexity that often hinder the optimization of international cooperation in the energy sector. Thus, efforts to strengthen international cooperation in the energy sector require a more inclusive, fair, and adaptive approach in order to truly increase joint energy security in a sustainable manner.

Keywords: International Relations, Energy Security, Geopolitics, Renewable Energy.

Introduction

In recent decades, the issue of energy security has become one of the main focuses in the discourse of international relations. Energy plays a vital role in supporting economic activities, infrastructure development, and national defense and security systems (Sayyidati, 2017). The high dependency on energy supplies, particularly oil and natural gas, has positioned energy as a strategic commodity that is vulnerable to global political dynamics. This situation has become increasingly complex as energy demands continue to rise alongside economic growth and the growing world population, while fossil energy reserves tend to be limited and unevenly distributed (Putri, 2021).

These conditions mean that relations between countries in the energy sector are determined not only by market mechanisms, but also by the political interests and strategies of each country (Sagena & Mustamin, 2007). Geopolitical conflicts in energy-producing regions such as the Middle East, Russia-Ukraine, as well as tensions in the South China Sea, demonstrate how political aspects can influence the stability of global energy supplies. Major consumer countries such as the European Union, the United States, and China compete to secure

energy supply routes through bilateral agreements or multilateral initiatives, which in turn affect the configuration of alliances and rivalries in international politics (Ibrahim et al., 2024).

On the other hand, the emergence of the energy transition agenda toward clean energy sources in response to climate change is also reshaping the map of international competition and cooperation. Countries are beginning to shift their focus to the development of renewable energy such as solar, wind, and green hydrogen, as well as strengthening energy efficiency technologies (Rahman, 2024). This phenomenon opens new opportunities for more inclusive and sustainability-oriented energy diplomacy. However, this transition also presents challenges, particularly for fossil energy-producing countries whose economies heavily rely on oil and gas exports (Subarkah, 2019).

The unequal distribution of energy resources around the world makes cross-border energy trade and flows an inevitability to meet global needs. Countries with abundant energy reserves, such as oil and gas, play a strategic role as primary suppliers, while countries with minimal energy resources depend heavily on imports to sustain their economic sectors (Badaruddin, 2020). This dependency triggers complex interactions not only between states but also between state actors and non-state actors such as multinational corporations, international financial institutions, and regional organizations that help regulate and facilitate global energy flows (Alami, 2012). In this context, the concept of energy security becomes highly relevant as it encompasses the dimensions of stable energy supply availability, guaranteed access to energy sources through distribution routes secure from geopolitical disruptions or conflicts, as well as affordable energy prices to support sustainable development (Keliat, 2021).

Indonesia is known as a country rich in natural resources, including in the oil and gas (O&G) sector. However, the potential of Indonesia's petroleum resources is currently relatively under-optimized and faces serious challenges related to reserve limitations (Gunawan et al., 2021). This condition is reflected in the trend of declining oil reserves that has been ongoing for a long time; since 1995, Indonesia’s oil reserves have steadily decreased. Data show that in

2002 Indonesia's oil reserves were only around 5 billion barrels, with production levels in 2007 reaching about 500 million barrels. Production was recorded at around 950,000 barrels per day in 2009, while the total remaining oil reserves across Indonesia's oil fields at that time remained at around 5 billion barrels (Manohara & Juwana, 2023). This situation raises concerns about the sustainability of national energy supplies, particularly to meet the growing domestic fuel needs driven by economic growth and increased energy consumption. Therefore, it is crucial for Indonesia to promptly take strategic steps through energy diversification, efficient utilization, and the strengthening of international cooperation to ensure national energy security in the future (Rudiany, 2020).

Research on the interconnection between international relations and energy security has been extensively conducted, reflecting the high academic interest in this issue. Some studies emphasize the geopolitical dynamics of energy, such as the work by Yergin (2006) which argued that energy, particularly oil and gas, has long been a strategic instrument in global political contests, triggering conflicts as well as strengthening alliances among nations. Meanwhile, research by Cherp & Jewell (2014) illustrated how the concept of energy security has evolved from merely an issue of supply availability into a more complex dimension, encompassing economic, environmental, and sustainability aspects.

At the regional level, a study by Umbach (2010) examined the energy security of the European Union, which is heavily influenced by its dependency on Russian gas, portraying the political vulnerability of the region to external dynamics. On the other hand, some studies such as by Sovacool (2011) focused more on how the renewable energy transition poses both challenges and opportunities to create new, more collaborative patterns of international relations. In the context of Indonesia, studies on energy security have largely been limited to reviews of oil and gas reserves and domestic policies, such as the work by Sihombing (2020) who analyzed national energy policies in facing declining oil production. Research that specifically links Indonesia's international relations dynamics with its energy security strategies

remains relatively scarce. Therefore, this study holds an important position in filling the literature gap by comprehensively examining how Indonesia's interactions with international actors can become both challenges and opportunities in strengthening national energy security. Thus, this research is expected not only to enrich academic discourse but also to provide practical contributions to the formulation of Indonesia's foreign policy in the energy sector.

Methods

This study uses a qualitative approach with a descriptive-analytical method to describe and analyze in depth the dynamics of international relations in the context of energy security. This approach was chosen because it is appropriate for exploring complex phenomena that are closely related to political, economic, and policy interactions between countries. The data used in this study comes from secondary data, namely literature studies including books, scientific journals, international agency reports, government policy documents, and articles from trusted sources that are relevant to the research topic. Data collection techniques are carried out through literature searches and documentation that are systematically reviewed to obtain a comprehensive understanding (Satori & Komariah, 2009). Data analysis in this study was carried out using the content analysis method, namely identifying the main themes, relationship patterns, and implications that emerge from various related literature. The results of this analysis are then used to compile interpretations regarding the challenges and opportunities faced by Indonesia in maintaining energy security through international relations. Thus, this study is expected to provide a complete picture of Indonesia's strategy and position in facing global dynamics related to energy, as well as being input for the development of more adaptive and sustainable national foreign and energy policies..

Results and Discussion

Opportunities

- **International Cooperation for Renewable Energy**

Globalization has created increasingly strong interdependence among countries, including in meeting energy needs. At the same time, the issue of global climate change has become a major concern for the international community, as reflected in various multilateral agreements such as the 2015 Paris Agreement. This situation encourages countries not only to secure their energy needs unilaterally but also to build patterns of international cooperation oriented toward the development of sustainable energy. International cooperation in the field of renewable energy has become one of the main strategies to address the challenges of climate change while maintaining national energy security.

International cooperation in developing renewable energy can be realized through cross-border investments in clean energy projects. Developed countries with capital and advanced technology allocate much of their investments to build solar, wind, geothermal, and bioenergy power plants in developing countries. Indonesia, for example, has gained opportunities to finance green energy projects from various international institutions such as the World Bank, the Asian Development Bank, and climate financing programs from donor countries. These investments not only help fund low-carbon energy infrastructure but also accelerate the achievement of energy transition targets set in national policies.

Apart from investment, another important aspect is cooperation in research and development (R&D) of renewable energy technology. Through partnerships with universities, research institutions, or multinational consortia, countries can share the latest research findings, conduct joint trials, and create more efficient and economical green technology innovations. Indonesia, for example, has cooperated with Germany through the “Energiewende” program in developing smart grids and renewable energy integration systems. Such cooperation strengthens domestic technological adaptation capabilities and minimizes the technology gap with developed countries.

Furthermore, international cooperation also opens up space for knowledge transfer and capacity building of human resources. In many renewable energy projects, cooperation agreements usually include technical training, workshops, and expert exchange programs. This becomes a strategic opportunity for developing countries to improve the competence of their engineers, technicians, and energy planners so they can manage new energy technologies independently in the future. Thus, international relations in the renewable energy sector are not only focused on physical development but also on human development, which is the key to the sustainability of the energy transition.

- **Foreign Investment**

Foreign direct investment (FDI) plays an important role in strengthening a country's energy sector, especially for developing countries that often face capital and technology constraints in developing clean energy. Within the framework of international relations, guaranteed energy security — both in terms of supply and policy stability — becomes a major pull factor for attracting foreign investors. Countries that manage to maintain political stability, provide transparent regulations, and guarantee investor rights will be better able to attract global capital flows into their energy sector. This becomes one of the crucial paths to support the acceleration of the energy transition from fossil energy to renewable energy.

Foreign investment in renewable energy projects brings double benefits. First, FDI provides financing for building low-carbon energy infrastructure such as solar power plants (PLTS), wind power plants (PLTB), or bioenergy facilities, whose initial costs are relatively high if relying solely on domestic funding sources. Second, such investments are often accompanied by technology transfer and human resource capacity building through technical cooperation, operator training, and project management assistance. This enables the recipient country not only to acquire new physical assets but also to strengthen national competencies in managing and developing renewable energy technology sustainably.

Moreover, the presence of foreign investors can accelerate energy diversification and reduce a country's dependence on fossil energy, whether in the form of oil or coal. Developing countries that were previously vulnerable to global energy price fluctuations can leverage renewable energy projects funded by foreign investment to enhance their national energy security. For example, Indonesia, through the Public Private Partnership (PPP) scheme in the energy sector, has successfully attracted foreign investors to develop solar power plants in Sulawesi and geothermal projects in Sumatra. This is a strategic step to strengthen the national energy mix and support greenhouse gas emission reduction targets.

- **Technology Transfer**

Technology transfer is one of the key aspects of international cooperation that supports the strengthening of the energy sector, particularly in renewable energy. In the context of international relations, technology transfer is not merely seen as the process of transferring goods or machinery, but also includes the transfer of knowledge (know-how), managerial skills, and capacity building of institutions that manage the energy sector. For developing countries, this represents a strategic opportunity to catch up in mastering low-carbon energy technologies, while simultaneously strengthening long-term national energy security.

International cooperation in the energy sector often includes clauses or programs on technology transfer. For example, in the construction of solar power plants (PLTS) or wind power plants (PLTB), foreign companies usually not only supply and install equipment but also provide technical training to local workers, assist in the development of digital monitoring systems, and facilitate expert exchanges. Thus, this technology transfer directly contributes to improving the quality of human resources and national institutions in managing renewable energy technologies.

Furthermore, technology transfer also broadens local innovation through the adaptation of foreign technology to the socio-economic and geographic conditions of the recipient country. Developing countries can learn the latest technologies from international partners and further

develop them to suit domestic needs, such as in the context of smart grids, energy storage systems (battery storage), or the integration of renewable energy into national grids. This process not only reduces dependence on fossil energy imports but also opens opportunities for the growth of domestic supporting industries that can absorb labor and drive economic growth.

From the perspective of international relations, energy technology transfer becomes a tool of development diplomacy that can strengthen inter-state relationships. Donor countries or investors gain a reputation as strategic partners in sustainable development, while recipient countries can reinforce their technological foundations to independently secure clean energy supplies. This ultimately creates mutual benefits that support the stability of international relations and contribute to global efforts to mitigate climate change.

- **Enhanced Security Stability**

International cooperation in the energy sector plays a crucial role in strengthening regional as well as global stability. From the perspective of international relations, energy often becomes a source of conflict due to its strategic nature and uneven distribution among countries. Dependence on fossil energy, whose supply is concentrated in certain regions such as the Middle East or Russia, makes importing countries vulnerable to supply shocks arising from political conflicts, embargoes, or domestic instability in producing countries. Therefore, through international cooperation that encourages the diversification of energy sources—particularly the development of renewable energy—the geopolitical risks associated with dependence on a single type of energy or a single main supplier can be significantly reduced.

Cross-border cooperation in the energy sector can also facilitate the establishment of dialogue mechanisms, negotiations, and multilateral agreements that support peaceful dispute resolution. This can be seen in frameworks such as the Energy Charter Treaty (ECT), which provides legal mechanisms for member states to promote secure energy investment and trade. Additionally, cross-country energy interconnectivity projects, such as the ASEAN Power Grid in Southeast Asia or cross-European gas pipeline projects, strengthen positive interdependence

among nations. This high level of interconnectedness encourages countries to maintain good relations and avoid actions that could disrupt regional stability.

Furthermore, international cooperation in the energy sector also serves as a collective instrument to address non-traditional security threats, such as climate change. A jointly pursued transition toward clean, low-carbon energy will help reduce global emissions, mitigate climate-related disaster risks, and prevent potential conflicts over environmental degradation such as competition for water sources or fertile land. Thus, the renewable energy agenda is not only relevant in the context of economic development but also becomes a foundation for creating broader human security.

From the standpoint of international relations, the stable conditions created through energy cooperation provide greater space for development, trade, and cross-sector diplomacy. Countries with secure energy supplies tend to be better able to maintain domestic stability and avoid social upheavals due to rising energy prices. Ultimately, energy cooperation contributes to a more peaceful global order, characterized by constructive interdependence and oriented toward shared prosperity.

Challenges

- **Differences in National Interests**

One of the main challenges in building international cooperation in the energy sector is the existence of fundamental differences in national interests. From the perspective of international relations, each country has its own national priorities, influenced by domestic conditions, resource availability, dependence on energy imports, and its political-economic structure. Energy-producing countries, for example, will strive to maximize revenue from exporting their natural resources, while energy-importing countries seek to keep prices as low as possible and ensure long-term supply stability. These differing orientations often create tensions that are difficult to accommodate within a cooperative framework that benefits all parties.

Moreover, national energy policies are frequently designed to guarantee domestic energy security, which can contradict global or regional agendas. For instance, some countries continue to provide large subsidies for fossil fuels to keep domestic prices affordable, even though this contradicts commitments to reduce carbon emissions agreed upon in international forums such as the Paris Agreement. Developed countries that have begun transitioning toward low-carbon energy technologies also tend to pressure other countries to do the same, whereas developing nations often prioritize affordable energy access for economic development. This disparity in levels of development frequently leads to dilemmas between energy justice and environmental responsibility.

Furthermore, national interests in the energy sector are often closely tied to geopolitical and defense factors. Countries that hold strategic positions along global energy distribution routes, such as straits or international gas pipelines, view control over these routes as political and security instruments. Clear examples can be seen in the geopolitical dynamics around the Strait of Hormuz or the Russia-Ukraine gas pipeline conflicts, which have disrupted energy supplies to Europe multiple times. This shows how energy is not merely regarded as an economic commodity but also as a strategic asset in national power calculations that are difficult to compromise.

- **Resource Inequality**

Inequality in access to energy resources and technology between developed and developing countries is one of the most significant obstacles to building fair international cooperation in the energy sector. Developed countries generally have larger financial capital, more advanced infrastructure, and much stronger research and technological innovation capabilities. This allows them to rapidly adopt and develop renewable energy technologies such as wind power, solar power, or hydrogen technology. Meanwhile, developing countries often still struggle to meet their population’s basic energy needs and tend to rely on fossil energy sources that are relatively cheaper and easier to access, despite their high environmental impact.

In addition, this resource gap is not only related to the availability of energy but also includes aspects of institutional and regulatory capacity. Many developing countries lack adequate policy frameworks, governance capacities, and human resources to attract investment in the clean energy sector. Even when international partnerships exist, this technological gap often places developing countries in a weaker negotiating position, resulting in them becoming more of a consumer market for imported technology rather than also developing local production capacity. This can create a new form of dependence that is no less problematic than dependence on fossil energy imports.

Ultimately, this inequality challenges the vision of an inclusive and just global energy transition. If not managed with solidarity principles and fair financing mechanisms, resource disparities can widen the development gap between nations. Therefore, an approach to international cooperation is needed that not only focuses on trade or investment but also emphasizes technology transfer, capacity building, and financing that favors the most vulnerable countries. In this way, efforts to achieve global energy security can go hand in hand with efforts to reduce development inequality.

- **National Sovereignty**

The issue of national sovereignty is one of the crucial challenges in building international cooperation in the energy sector. In international relations studies, state sovereignty is often understood as the exclusive right of a country to regulate its domestic affairs without foreign interference, including in the management of natural resources. Energy, which largely originates from a region's natural wealth, is often considered a strategic asset that is an important part of a nation's identity, security, and interests. For this reason, energy policies are usually strongly protected by the principle of sovereignty to avoid excessive domination or influence by other countries or multinational corporations.

Concerns about foreign intervention in energy policies can arise in various forms, ranging from pressure to open energy markets to foreign investment, obligations to implement

international environmental standards deemed potentially restrictive to local industrial growth, to multilateral negotiations perceived as reducing domestic policy space. Developing countries, especially those still dependent on the extractive sector, often see energy policies as vital instruments to drive national economic development. This makes them more cautious in agreeing to international agreements that could limit domestic control over their strategic resources.

In the context of international cooperation for the energy transition toward renewable energy sources, this sovereignty issue can also hinder the adoption of binding global policies. Many countries prefer that strategic decisions regarding energy remain entirely under national jurisdiction, even though globally there is pressure to accelerate the transition to address climate change. Therefore, for international cooperation to work effectively, it is important to formulate collaborative mechanisms that respect national sovereignty while ensuring shared benefits acceptable to all parties. Voluntary partnership approaches—based on mutual benefit, transparency, and respect for sovereignty—are often pursued as a middle ground in global energy diplomacy.

- **Regulatory Complexity**

Regulatory complexity is one of the main challenges in building and implementing international cooperation in the energy sector. Each country has its own legal system, technical standards, fiscal policies, and licensing regimes, generally designed to accommodate their domestic interests. In the energy sector, this can be seen from differences in safety standards, environmental regulations, subsidy policies, and provisions related to ownership of strategic assets. When countries try to establish cross-border cooperation, these regulatory differences can create legal uncertainties that complicate the planning and execution of joint projects.

Moreover, in the context of foreign investment in the energy sector, multinational companies often face overlapping regulations at the national, sub-national (provincial/district), and even regional levels (such as ASEAN, the European Union). Lengthy bureaucratic

procedures, diverse administrative requirements, and differences in legal interpretations can lead to high transaction costs. This situation not only slows down project implementation but can also reduce investor interest in participating in cross-border energy infrastructure development, especially renewable energy projects that require long-term legal frameworks and regulatory certainty.

To overcome these barriers, many international forums seek to facilitate the harmonization of standards and regulatory frameworks, such as the International Energy Agency (IEA) or the Energy Charter Treaty (ECT). However, the harmonization process is not easy because it must take into account each country's economic conditions, institutional capacities, and development priorities. Therefore, intensive dialogue, regulatory transparency, and clear dispute resolution mechanisms are needed so that regulatory complexity does not become a major obstacle to international cooperation in achieving the shared goal of sustainable and inclusive global energy security..

Conclusion

The dynamics of international relations play a crucial role in ensuring global energy security. Energy availability, accessibility, and affordability are not solely determined by domestic policies but also depend heavily on patterns of interaction between countries, whether through bilateral, multilateral, or international organization. With the increasing global awareness of climate change issues, international cooperation in developing renewable energy, increasing energy efficiency, and conducting technology transfer is a strategic opportunity to drive the transformation towards a more sustainable energy system. In addition, international cooperation facilitated through foreign investment and technology transfer can help developing countries strengthen their capacity in the energy sector. The presence of foreign capital and advanced technology can not only accelerate the development of renewable energy infrastructure, but also increase national energy security and open up employment

opportunities. On the other hand, solid international relations in the energy sector also contribute to political stability and regional security, because they reduce the potential for conflict due to resource struggles and promote the principle of constructive interdependence.

However, there are challenges that cannot be ignored. Differences in national interests, imbalances in resources and capacities between countries, sensitive issues related to sovereignty, and the complexity of cross-jurisdictional regulations are inhibiting factors in optimizing international cooperation in the energy sector. Each country tends to prioritize its sovereignty in managing natural resources, which sometimes runs counter to the spirit of openness and global integration. Differences in regulations and standards can also increase transaction costs and reduce interest in cross-border investment. Therefore, to maximize opportunities and minimize challenges, an adaptive international relations approach is needed, mutual respect for sovereignty, and prioritizing the principles of justice and equality. Inclusive dialogue, policy transparency, harmonization of standards, and a flexible cooperation framework are key to realizing sustainable energy security. Thus, international relations are not only an instrument of political diplomacy, but also a strategic means of creating a more resilient, just, and environmentally friendly global energy system in the future.

References

Alami, A. N. (2012). Politik luar negeri Indonesia dan isu keamanan energi. *Journal of Political Research*, *9*(2), 14-14.

Badaruddin, M. (2020). Signifikansi Energi dalam Dinamika Geopolitik di Timur Tengah.

Cherp, A., & Jewell, J. (2014). The concept of energy security: Beyond the four As. *Energy policy*, *75*, 415-421.

Farid, M. (2017). Keamanan energi dalam politik luar negeri indonesia. *Jurnal Ilmu Hubungan Internasional*, *74*, 71-80.

Gunawan, I., Windarta, J., & Harmoko, U. (2021). Overview potensi panas bumi di Provinsi Jawa Barat. *Jurnal Energi Baru dan Terbarukan*, *2*(2), 60-73.

Ibrahim, M. R., Sudirman, A., & Tumulo, L. J. (2024). Implikasi Dinamika Geopolitik Energi Rusia-Ukraina terhadap Keamanan Energi di Indonesia. *Arus Jurnal Sosial dan Humaniora*, *4*(3), 1314-1323.

Keliat, M. (2021). Kebijakan Keamanan Energi. *Global: Jurnal Politik Internasional*, *8*(2), 33-47.

Manohara, B. P., & Hikmahanto Juwana, S. H. (2023). *Pengelolaan Hulu Migas di Sejumlah Negara Penghasil Migas*. PT. RajaGrafindo Persada-Rajawali Pers.

Putri, A. (2021). Upaya Negara Dalam Mencapai Keamanan Energi. Studi Kasus: Transformasi Kebijakan Energi Korea Selatan. *Frequency of International Relations (FETRIAN)*, *3*(2), 1-28.

Rahman, V. S. P. (2024). Strategi Indonesia dalam Mengatasi Perubahan Iklim Melalui Kerjasama Internasional. *Mimbar: Jurnal Penelitian Sosial dan Politik*, *13*(1).

Rudiany, N. P. (2020). Pentingnya Diplomasi Energi dalam Upaya Mencapai Ketahanan Energi Nasional. *Centre for Strategic and International Studies*.

Sagena, U. W., & Mustamin, M. H. (2007). Memahami Konsep Keamanan Energi: Antara Pendekatan Tradisional dan Non-Tradisional. *Understanding Energy Security Concept*, 4-6.

Satori, D., & Komariah, A. (2009). Metodologi penelitian kualitatif.

Sayyidati, A. (2017). Isu Pemanasan Global dalam Pergeseran Paradigma Keamanan pada Studi Hubungan Internasional. *Jurnal Hubungan Internasional*, *6*(1), 38-45.

Sihombing, G. (2020). Transformator Energi, Potensi Dan Pengujian Model Energi. *Jurnal Syntax Transformation*, *1*(09), 612-618.

Sovacool, B. K. (Ed.). (2011). *The Routledge handbook of energy security* (pp. 11-31). London: Routledge.

Subarkah, H. R. (2019). Upaya Multinational Corporation (MNC) Dalam Mengatasi Perubahan Iklim (Studi Kasus: Coca-Cola Mengatasi Perubahan Iklim). *Global Political Studies Journal*, *3*(2).

Umbach, F. (2010). Global energy security and the implications for the EU. *Energy policy*, *38*(3), 1229-1240.

Yergin, D. (2006). Ensuring energy security. *Foreign affairs*, 69-82.