IRSTI 11.25.15 https://doi.org/10.26577/IRILJ.2023.v101.i1.012

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THE CONTRIBUTION OF RENEWABLE ENERGY TO INTERNATIONAL SECURITY: A PRELIMINARY STUDY

The world is experiencing a process of energy transition from fossil fuels to renewables. Such a transition is pushed by the necessity to face a global environmental challenge like climate change as well as pulled by constant research for reliable, affordable and sustainable energy security strategies. The energy transition will progressively introduce important changes in the geopolitical sphere, thus challenging some of the assumptions ruling the contemporary system of international relations. Among them, a critical issue is if the development of a renewable energy system would reduce or increase the risks of conflict. This preliminary study, which is based on a qualitative assessment of the available academic literature, examines the impact that a growing use of renewables might have in the framework of international security. The main conclusion is that renewables might give a positive contribution to international security by reducing the dependency system characterizing the current trade of hydrocarbon resources, mitigating the "resource curse" of energy exporting countries, and reducing greenhouse gas emissions, thus moderating the insurgence of all those risks associated with climate change.

Key words: Energy transition; renewables; energy security; resource curse; international security.

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Жаңартылатын энергияның халықаралық қауіпсіздікке қосар үлесі: алдын-ала зерттеу

Қазіргі уақытта қазіргі әлем энергетикалық транзит кезеңін бастан өткеруде: қазба отындардан жаңартылатын энергия көздерін пайдалануға көшу жүргізілуде. Бұл қызықты тақырыпқа ерекше қызығушылықты энергетикалық қауіпсіздікті қолдаудың қолжетімді және тұрақты стратегияларын іздеу бойынша ағымдағы зерттеулер тудырады. Энергетикалық ауысу бірте-бірте әлемнің геосаяси картасына маңызды өзгерістер енгізуде, осылайша қазіргі халықаралық қатынастар жүйесі үшін дәстүрлі болып табылатын кейбір постулаттарға күмән келтіреді. Бұл ғылыми мақаланың сыни сұрағы мынада төмендегідей: жаңартылатын энергия жүйесін дамыту қақтығыс қаупін азайта ала ма, немесе керісінше, оның шиеленісуіне әсер етеді ме? Қолда бар академиялық әдебиеттерді сапалы бағалауға негізделген бұл алдын-ала зерттеу жаңартылатын энергия көздерін пайдаланудың өсуі халықаралық қауіпсіздікке тигізетін әсерін зерттейді. Бұл ғылыми мақаланың негізгі қорытындысы жаңартылатын энергия көздері көмірсутегі ресурстарының ағымдағы саудасын сипаттайтын тәуелділік жүйесін азайту арқылы халықаралық қауіпсіздікке оң үлес қоса алады, бұл маңызды энергия экспорттаушы елдердің бүгінгі күні «ресурстық қарғыстарын» деп аталатын терминді азайтады және парниктік газдардың шығуын азайтады, бұл жаһандық климаттың өзгеруіне проблемасымен байланысты барлық тәуекелдердің пайда болуын азайта алады.

Түйін сөздер: Энергияның ауысуы; жаңартылатын энергия көздері; энергетикалық қауіпсіздік; ресурстық қарғыстарын; халықаралық қауіпсіздік.

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Вклад возобновляемой энергии в международную безопасность: предварительное исследование

Современный мир переживает период энергетического транзита: переход от ископаемого топлива к использованию возобновляемых источников энергии. Данный процесс вызван необходимостью справиться с глобальными экологическими проблемами, среди которых особое место занимает проблема изменения климата. Особенный интерес к этой теме вызван актуальными исследованиями по вопросам поиска доступных и устойчивых стратегий энергетической безопасности. Энергетический переход постепенно вносит важные изменения в геополитическую картину мира, тем самым подвергая сомнению некоторые постулаты, которые являются традиционными для современной системы международных отношений. Критический вопрос данной статьи заключается в следующем: может ли развитие системы возобновляемых источников энергии уменьшить риск возникновения конфликта или же, наоборот, способно привести к его обострению? В этом предварительном исследовании, основанном на качественной оценке доступной академической литературы, рассматривается влияние, которое растущее использование возобновляемых источников энергии может оказать на систему международной безопасности. Главный вывод заключается в том, что возобновляемые источники энергии могут внести положительный вклад в международную безопасность, сократив систему зависимости, характеризующую текущую торговлю углеводородными ресурсами, что приведет к уменьшению «ресурсного проклятия» стран-экспортеров энергии и сократив выбросы парниковых газов, что может смягчить появление всех рисков, связанных с изменением климата.

Ключевые слова: Энергетический переход; возобновляемые источники энергии; энергетическая безопасность; ресурсное проклятие; международная безопасность.

Introduction

Since the oil crisis of 1973, the issue of energy security entered in the national security agenda of any government in the world. Indeed, an escalating competition over fossil fuels (coal, oil and natural gas) characterized the end of the 20th century-beginning of the 21st century. The non-renewable nature, geographical unequal distribution, and lack of readily accessible substitutes made these energy resources "strategic goods": limited available commodities that are highly demanded in the market due to their importance and criticality in the socio-economic development of a country. (Baldwin 2020, 223) At its extreme, the energy matter become either an objective, mean or cause of a conflict. (Månsson 2014, 107)

And yet, the world is, nowadays, undergoing a process of energy transition that could indirectly smooth the international tensions over the energetic aspect. As in the case of similar transition processes of the past, such a change is driven both by technological innovation, an important increase in energy demand as well as a renewed political willingness to explore a new pioneering energy system. (Kern and Markard 2016, 298) In this regard, the set up of the Sustainable Development Goals (UNGA 2015) and the adoption of the Paris Agreement (UNFCCC 2015) have been fundamental turning points: they urged the international community to implement and embrace a green approach of development that entailed, among other things, a growing use of renewables as energy resources.

This energy transition would plausibly last for several decades and it will provide a geographically diverse distributed impact at first. Still, this research aims to critically examine if a new energy system based on renewables might positively contribute to global security in the long-term.

As claimed by Johnsson (2013, 598), 'the security aspects of RE [renewable energy] are seldom analysed and there is a significant research gap in this field.' Likewise, Scholten (2018, v) affirms that the analysis of interstate energy relations in the framework of the renewable energy transition is 'a novel topic that will undoubtedly garner more attention in the coming decades.' Considering the current limits in academic literature, the object of this analysis is to preliminary address the impact that a growing use of renewable energy resources might have in the framework of international security as a whole. The subject of this study is the assessment of

the ongoing energy transition from hydrocarbons to renewables as an international security matter.

The research method used in this article is a qualitative content study based on a critical analysis of the diverse arguments that have been proposed in the academic literature to support or contest the idea that an energy system based on renewables might play a positive role from an international security perspective. The main hypothesis of this article is that an increased use of renewable energy resources might offer a positive contribution to international security by decreasing the problematic dependency between energy producing countries and energy importing countries, mitigating the negative impact of the 'resource curse', and preventively intervening on the global challenges associated with climate change.

Material and Methods

Methodologically, this exploratory study is based on an extensive critical assessment of the academic literature that examine the relation between energy transition to renewables and its impact on international security. Through the analysis of different points of view, the author intends to reveal, examine and discuss emerging trends and patterns among researchers and experts of the field. As such, this study uses a grounded theory approach, which is also integrated with a story lining technique to better explicate the relations among the examined concepts. (Bhattacherjee 2012, 115) The target audience of this article are all those people who have an interest in areas such as, for example, energy security, energy transition, and international security. As main limit, this article offers only preliminary considerations on the matter, being the attention on the impact of renewables to international security a rather new topic of academic research.

From an academic perspective, this topic is of high relevance considering the whole growing attention toward the green energy transition and its consequences for the whole international system. Nowadays, the advent of renewable energies is given for granted by the majority of academic and non-academic experts operating in the energy sphere. To be precise, fossil fuels will hardly disappear from human society any time soon. Nevertheless, the dominant narrative in the energy field is already shifting away from them. As a result, more studies will be focused on energy efficiency and renewable sources, thus raising a new system of thought.

Even if the process of energy transition will plausibly occur at different speeds, thus producing unequal impacts in different places and businesses, it will progressively and inevitably become a global phenomenon. Indeed, as once said by Nursultan Nazarbayev (2012), first President of Kazakhstan, when he introduced the Kazakhstan 2050 Strategy: 'The era of hydrocarbon economy is coming to an end. We face the beginning of a new era where human activities will be based not so much on oil and gas, but on renewable resources.'

The main research question of this article is "what is the prospected impact of renewable energy on international security according to the academic studies released up to now?" While addressing such key question, additional issues will be considered, such as, for example: in which way is energy transition related to international security? Is the transition toward renewables going to foster peaceful relations or exacerbating already existing tensions? What are there "murky waters" that need to be further considered when assessing the relation between energy and security?

Literature Review

On the whole, a comprehensive academic literature has been published about the issue of energy transition. Among the available research is worth to mention the comprehensive analysis on the concept of energy security made by Winzer (2012), Ang, Choong and Ng (2015), and Proskuryakova (2018); Sovacool and Brown's study (2010) and Chester's research (2010) on the diverse dimensions and polysemic nature of energy security; Smil's book (2010), the United Nations' report (2021), and Gribkova and Milshina's article (2022) on the patterns of energy transition; and the books of Pascual and Elkind (2010), Dyer and Trombetta (2013), Mouraviev and Koulouri (2019), and Hafner and Tagliapietra (2020) about the socio-economic and geopolitical implications of energy security and energy transition.

Moving to the relation between fossil fuels and the risk of conflicts, some of the most valuable studies from a theoretical and case-study analysis are the researches conducted by Kaldor, Karl and Said (2007), Moran and Russell (2009), Colgan (2013), Månsson (2014), and Högselius (2019). Differently, noteworthy references specifically addressing the potential impact of renewable energies in the framework of international security can be found in the research of Johanson (2013), Mecklin (2016),

Paltsev (2016), O'Sullivan, Overland and Sandalow (2017), Scholten (2018), Proedrou (2018), and Overland (2019).

Results and Discussion

There are many diverse definitions of energy security in academia. (Winzer 2012; Ang, Choong and Ng 2015; Van de Graaf et al. 2016; Proskuryakova 2018) These definitions tend, nevertheless, to share a basic ground: the view of energy security as the capacity to get a constant and reliable access to energy sources at a reasonable price.

According to the result of this research, most of the experts who are interested in the systemic long-term analysis of energy security tend to lead to the conclusion that 'an environmental unsustainable system produces instability, which inevitable leads to insecurity.' (WWF 2017) The key point is that there cannot be security without sustainability. Indeed, an international system grounded on fossil fuels exploitation is fragile at its roots.

However, there are contrasting opinions about how the energy transition toward renewables might have an impact on international security. Some authors (e.g. Mecklin 2016; Paltsev 2016) believe that this transition might cause a growing instability due to the related changes in the global distribution of power and the formation of new relations of dependency. Differently, other authors (e.g. O'Sullivan, Overland and Sandalow 2017; Proedrou 2018) are convinced that, although the transition process itself might raise new challenges, an energy system grounded on renewables might support international security by strengthen internal energy availability and diversification. As a result, 'at least in the long term, a global energy system dominated by renewable energy will become more stable, peaceful and just than one dominated by fossil fuels.' (O'Sullivan, Overland and Sandalow 2017, 37)

Diverse arguments are provided by academic literature to support this perspective. Likewise, several challenges have been examined in relation to the raise of renewables in the global energy system. Still, here the attention is exclusively focused on what are, arguably, the three most critical points: a wider and more varied accessibility to energy, a potential mitigation of the "resource curse" affecting energy exporting countries, the fight against climate change.

Concerning the first aspect, a fossil fuels energy system seems more unstable from a security perspective than a renewable energy system. In this regard, Månsson's study on the specific characteristics of the energy system that can increase the risk of conflict provides some interesting reflections on the matter. According to such author, geographical concentration of vital resources, transit chokepoints and low-price elasticity of demands are features that can increase the risks of conflicts aimed at securing and/or controlling energy system structure. In addition, import/export dependency, lack of available substitutes, and high-market competition might turn energy resources into "weapons" through a deliberate reduction of flow and/or a strategic fluctuation of prices by supplier or user. (Månsson 2014, 113)

Indeed, the competition for limited available and hardly replaceable energy resources – oil, in the specific – has been defined as a zero-sum game that can even lead to direct conflicts among major powers. (Klare 2008, 30) Even if there are some authors who contest such point of view (Meierding 2016), several scholars seem to share such concerns. For example, according to Kaldor, Karl and Said (2007, 2), 'there is widespread agreement in both quantitative and qualitative social science research… that oil and war are linked.' Högselius (2019) adds that the contemporary energy trade has generated four types of risks: supply risks (accessibility to energy), economic risks (price variations), environmental risks (such as waste and pollution), and political risks (limits to the freedom of action due to a state of dependency). Such risks are, potentially, all factors fuelling conflicts. Furthermore, in the view of Moran and Russell (2009, 4), the peak oil anxiety is itself a condition that 'reinforces the tendency to see the energy sector as one in which particularly critical threats are liable to raise.' Therefore, the argument is that a fossil fuels system creates such a harsh international competition and unsteady dependency that can possibly – even if, not necessarily – escalate geopolitical tensions into conflicts.

In this regard, a transition toward renewables could partially mitigate such a dynamic. Renewables can support energy security by diversifying the sources of power generation, thus breaking the vital dependency from fossil fuels and creating a more resilient self-sufficiency energy system. (Ölz, Sims and Kirchner 2007, 9-10) As a result, 'energy-related sticks and carrots… would evaporate in a post-fossil world, and with it also the risk of a conflict.' (Proedrou 2018, 148-149)

Some authors (e.g. Paltsev 2016; Mecklin 2016;) disagree with such optimistic view, mainly

considering the green energy transition as the opening of a new global race for materials and technologies. However, in a renewable energy system the risk of dependency from "others" and, as a consequence, of an escalating competition for sources is circumscribed due to three key factors: first, the substitutability of raw material for renewable energy technologies is higher than for fossil fuels since they are more evenly distributed geographically; second, a customized renewable energy mix can be built to meet the specific needs of local communities, while using a diverse set of technologies; third, in the long-term, the transition to renewables will allow most countries to internally self-produce part of their energetic needs, thus becoming less dependent from imported energy resources.

Concerning the second aspect, the "curse" of the contemporary fossil fuels energy system could partially fade with a transition to renewables. The "resource curse" is a condition in which a local abundance of natural resources paradoxically leads to low economic performance, less democratization, and violent insurgencies. This phenomenon is often accompanied by additional features such as volatile prices of the considered goods and/or possible sudden digressions in the volume of exportations. (Månsson 2014, 113)

Low and middle-income countries that are rich in oil resources seems particularly affected by this problem so that the terms "oil curse" has been specifically designed to define them. An author like Colgan (2013, 3-4) pushed even further the matter by supporting the petro-aggression theory, which claims that 'under certain circumstances, oil-exporting states are systematically more likely to act aggressively and instigate international conflicts.'

Although multiple reasons have been offered to explain this paradox, two critical aspects seem those identified by Ross and Karl. According to Ross (2012, 21-22), 'the political and economic problems of the oil states can be traced to the unusual properties of oil revenues [scale, source, stability, and secrecy]'. Somehow related to that matter is also the argument of Karl (2005, 22), who identifies in an overwhelming dependency from oil revenues the origin of the problem because 'due to the highly volatile nature of oil markets, oil-exporting countries often fall victim to sudden declines in their per capita income and growth collapses of huge proportions.'

A global systemic transition toward renewable energy could force some changes in oil and gas exporters, which are affected by the "resource curse". In the view of Proedrou (2018, 150), 'a collapse in demand for oil and gas would cripple resource-based, non-diversified economies… and debilitate their geopolitical clout… these states' elites will struggle to remain in power. Turning current fossil-induced revenues into sustainable investments of one kind or another constitutes the only available way out of descent.' In turn, such a change could reduce social instability and bring down the risk of uprisings.

Moreover, according to Overland, the feared risk of a new resource curse in countries rich in rare earth elements that are used in the production of renewable energy technologies is just a myth. As claimed by such expert, 'renewable energy for export could potentially require more long-term maintenance of infrastructure, generate more local jobs, and produce more stable revenues than oil and gas have done… [plus] the assumption of a new resource curse also ignores learning processes among countries handling resources revenues.' (Overland 2019, 37)

Finally, from a sustainability perspective, aspects like environmental degradation, high emissions, and the long-term effects of climate change could also trigger social instability and produce chained negative consequences. (Månsson 2014, 113) Several studies (e.g. IPCC 2015; World Meteorological Organization 2017) have clearly shown the unquestionable direct role played by the combustion of fossil fuels – and the related release of CO2 emissions – to the rise of global temperature. The Earth is on the verge of a global scale disaster unless urgent measures will not be taken: climate change would, inter alia, provoke wide-scale drought, sea level rising, melting of ice caps, ocean acidification, biodiversity loss, food insecurity, and massive climate refugees. (Frigerio 2019)

As a result, a transition from hydrocarbons to renewable energy resources is nowadays fomented by the whole international community as a condition to foster international security. Primarily, as stated by O'Sullivan, Overland and Sandalow 2017, vii), 'reduced greenhouse gas emissions as a result of expanded use of renewable energy should logically reduce the risk of conflict and instability that climate change would otherwise generate.' Of course, such a scenario will affect the current geopolitical configuration of power so that some countries – arguably, those who will firstly achieve energy diversification, self-reliance and technological innovation – will gain more strategic advantages than others. However, the whole global system will

gain beneficial effects by preventing and mitigating catastrophic risks.

Conclusions

While recognizing the importance of contextual conditions (e.g. social, political and economic aspects) academic literature suggests that the characteristics of the energy system itself could also play a central role in the international security framework.

A system based on fossil fuels exploitation seems to naturally incorporate some factors of risks due to the geographical unequal distribution of these resources and their related infrastructure, the high volatility of price of these sources, the possible sudden variations in the supply flow, the countries' dependency from these sources as drivers for economic development, the lack of easily available substitutes, the paradox of resource curse, the environmental impact associated with the exploitation and utilization of these resources.

Although there is no full agreement on the matter, it seems that the transition from fossil fuels to renewable energies could partially mitigate such risks, primarily by increasing energy diversification, reducing the dependency from fossil fuels, enhancing the provision of reliable energy sources to local communities, and moderating the overall environmental impact. If these premises will be confirmed, it is highly plausible that energy resources will partially lose their status of strategic goods, thus also changing the way in which they will get approached within the international community.

Still, the arguments raised up in this article on the base of the available literature allow only preliminary conclusions. Further studies are needed to examine the whole set of opportunities and risks associated with the energy transition toward renewables. Among the uncertainties that deserve deeper analysis there are, for instance, the effective capacity of renewables to act as alternative energy sources for electricity, heating and fuels in diverse contexts; the possible geopolitical tensions over the exploitation of certain renewable sources such as, for example, hydropower generated through cross-border rivers; the technical challenges associated with the construction of flexible power plants and resilient grids that might accept and connect diverse energy sources; the indirect environmental impact of renewables (e.g. use of contaminating materials for the production of the related technologies, impactful modification of the surrounding natural environment, etc.); the instability caused by a renewed geopolitical power distribution due to the foreseen changes in the global energy balance. Therefore, the debate around the impact of renewable energy on international security is plausibly going to last in the decades to come.

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