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Energy Security in Security Studies: A Systematic Review of Twenty Years of Literature

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Abstract

Energy security has clear relationships with national security – historically, semantically, and practically. This exploratory study offers a quantitative and qualitative content analysis of 43 academic articles focused on energy issues, published in five international security studies journals – International Security, Security Dialogue, Security Studies, Contemporary Security Policy and Survival – from 2001 to 2020. The study identifies the main energy themes covered in the articles and the authors' demographics. The paper concludes that the coverage of energy issues has been quite sporadic and largely underexplored in security studies. The essence of the debates over energy issues has not changed much since the energy crises of the 1970s – it remains predominately state- and Western-centric with a primary focus on oil and nuclear power. The crude oil price surge because of supply disruptions from the Middle East is still viewed as a main threat to energy security. Similarly, international armed conflicts, domestic instability and nuclear proliferation are prioritised among the most critical outcomes of energy insecurity. The primary public policy responses to threats to energy security still focus on foreign policy, diversification of suppliers and energy sources, domestic energy efficiency and strategic energy stockpiles.

Keywords: energy security, security studies, international relations, security of supply, oil, content analysis

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Introduction

Energy is a crucial part of human life and one of the critical elements of any human activity. It is required for heating, mobility, lighting and communication and is, therefore, integral to modern society. At the same time, energy, like most of society's resources, is scarce, meaning that society has limited available energy. Although physical energy is usually not in short supply, the useful energy that people can use in the form of energy services is (Jansen & Van der Welle 2010). Because useful energy is a scarce resource, people had to learn how to prevent that scarcity and mitigate its consequences in their lives. Thus, the pursuit of energy security exists as long as people use energy (Valentine 2010).

Even though energy services are integral to all aspects of human life, energy security only became a public policy concern at the beginning of the 20th century when the issue of energy security attracted the attention of national defence policymakers.

The time the issue of energy security entered the public policy agenda was not coincidental. The beginning of the 20th century witnessed revolutionary transformations of energy systems and, specifically, the emergence of mechanised warfare, and high costs and benefits became associated with these transformations. For instance, the decision to convert the British Navy from coal to oil brought not only advantages in speed and flexibility but also risks related to the stability of oil supply from abroad. During World War II, the role of energy resources, especially oil, in military capabilities became evident – some strategic objectives during the war were determined by the intention to secure energy supply or prevent adversaries from doing so. For example, concerns about oil security were important for Japan's decision to occupy the East Indies and attack US troops in Pearl Harbour, and for Germany to drive toward the oil-rich Caspian region (Hayward 1995; Yergin 1991).

Even though national security has had to deal with a broad range of security threats – military, economic, social and environmental – from the moment of its birth after World War II, security studies have been focused mainly on the military dimension of security. It is not surprising because security studies grew out of debates over protecting the state against external threats after World War II. At that time, the military dimension of national security dominated other dimensions of security, such as the economy or social issues, because the threats of external aggression were viewed as more possible and severe than economic crises or social problems. Consequently, during the Cold War, security studies was composed predominately of research focused on military statecraft (Baldwin 1997; Hampson 2013; Wolfers 1952). Even though other threats, including

domestic ones, such as the economy, environment, health, poverty and inequality, were acknowledged, they were discussed chiefly regarding their impact on military security.

Yet the energy crises of the 1970s that resulted in crude oil scarcity and panic in the Western world brought the question of energy security into the security studies discourse. As Robert J. Lieber (1976) stated, 'energy became a security issue when the supply of oil and later the ability to pay for this oil become a matter of national survival'. Moreover, the crisis particularly challenged the military focus of security studies. As Joseph Nye (1980) so aptly put it, 'the probability of Soviet tanks rolling across the north German plain is much lower than the likelihood of an interruption of oil supplies stemming from various conflicts in the Middle East. Yet the United States is less prepared for an energy emergency than for a military attack'.

Even though the impact of access to natural resources on how and to what degree states interact with other states had been acknowledged before, the 1970s oil crises highlighted the direct relationships between energy, security and foreign policy. Control over flow, prices and energy infrastructure has become a central element of power dynamics in international politics (Colgan 2014). As a result, energy security has become an inevitable part of international politics and, therefore, of foreign policy.

Historically, international security studies was primarily concerned with security in a bipolar world – the security of other countries was mainly addressed only in the sense of how it could affect the security of superpowers (Buzan & Hansen 2009). Consequently, energy security debates during the Cold War covered almost exclusively the energy security of the United States. The energy security of other countries was mainly discussed as part of the global rivalry between the superpowers. Even the US closest allies, such as Western Europe and Japan, were chiefly concerned about how pursuing their energy security might affect their relationships with the United States and its national security (Nye 1980).

Energy security as a concept has always had clear relationships with national security – semantically, historically and practically – and can legitimately be viewed as a particular instance of national security. Nonetheless, the exact place of energy security in the security studies scholarship is unclear. Energy security as an element of security studies scholarship depends on several groups of issues and several sets of public policy responses to the issues (Deese 1979). Almost a half century after the 1973 oil crisis, a particular transformation of the views on energy security might be expected to happen in security studies. Yet, no systematic analysis of these issues and policy responses has been conducted.

Considering the historical ties between energy and national security, this study aims to identify the current debates on energy security and related energy

issues in the security studies scholarship. The study aims to answer the following research question: *How does contemporary security studies include energy issues in its scholarship?*

A concept of security is a highly ambiguous concept if used without specification: security for whom, from what threats, for which values and by what means (Baldwin 1997; Wolfers 1952)? The importance of making such clarification specifically about energy security was also emphasised by Cherp and Jewel (2011). Therefore, this study also attempts to identify how security studies scholars conceptualise energy security and, more specifically, how they answer the following questions: (1) Energy security for whom? (2) Energy security from what threats? (3) Energy security for which values? and (4) Energy security by what means?

Since the discussion about energy security issues is context dependent – energy security means different things to different people at different times and in different situations (Ang, Choong & Ng 2015) – the study is also interested in the authors' demographics – in other words, in addition to the question 'what is said about energy in the security studies scholarship', the study aims to find an answer to the question 'who says?'

To answer these questions, the following exploratory study offers a quantitative and qualitative content analysis of academic articles on energy issues published in the top five international security studies journals from 2001 through 2020. Even though the sampling frame was limited to five journals and the sample to only 43 articles – the study's main limitation – the paper analyses *all* articles on energy issues published in these top five security studies journals over the last two decades. Thus, it can provide a wealth of information to answer Lasswell's (1948) classic question – who says what, to whom, why, how and with what effect – about energy in national security debates.

Last but not least, to understand the present and to influence future energy security, it is vital to understand how different security studies scholars thought about energy security. Because of the importance of the theoretical, historical background of energy security scholarship, a short unsystematic review of pre-2001 energy security articles in international relations journals was conducted. The purpose of that review was not to compare the articles published from 2001 to 2020 but to tentatively identify the major categories for content analysis. Yet certain conclusions can be made about the evolution of the scope and focus of debates on energy issues in security studies during the second part of the 20th century.

The article proceeds as follows. The next section briefly presents the historical coverage of energy issues and security in international relations and security studies literature before 2001. Section 3 describes the research design and methods used in this study. In section 4, the study turns to the results of content

analysis and their discussion. The final section concludes and offers some directions for further research.

Energy security in security studies scholarship before 2001: A short literature review

When energy security entered the security studies discourse in the 1970s, the question of conceptualisation, or specifying an exact meaning of energy security, was immediately aroused. Indeed, without a clear definition, it is not possible to communicate about energy security issues and to conduct a much-needed policy analysis (Baldwin 1997). In 1979, David A. Deese (1979), defined energy security as 'a condition in which a nation perceives a high probability that it will have adequate energy supplies (including traditional sources such as firewood, and plant and animal residues that are frequently not traded in the marketplace) at affordable prices'. Later, Daniel Yergin (1988) defined the objective of energy security as: 'to assure adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardise major national values and objectives.'

Interruption of energy supply, unaffordable prices for energy or jeopardised values in its acquisition have been viewed as the primary threats to energy security (Yergin 1988). However, the specific nature of such interruptions, price surges and values they jeopardise has been a subject of debate in security studies literature.

The asymmetry of energy trade and market power of energy producers has been viewed as the primary source of price surges. Oil cartels play a crucial role in the energy security of energy-importing countries because of the so-called 'OPEC multiplier', a situation when even a slight increase in world energy demand results in a disproportionately large increase in demand for OPEC oil and its relative power (Lieber 1992; Mossavar-Rahmani 1983; Yergin 1988). Yet it was also acknowledged that the energy market imperfection is not the sole threat to energy security. Terrorism, technological accidents, wars and extortion can threaten the uninterrupted supply of energy at reasonable prices. Even though most of the concerns are about the uninterrupted supply of oil, the supply assurances problem exists for other types of energy sources as well – countries that operate nuclear reactors are also sensitive to the interruption of nuclear fuel supply from foreign countries (Rydell 1981).

An interruption of supply and high energy prices can affect national security in different areas and through different mechanisms. Competition for scarce energy resources can cause interstate and domestic armed conflicts. As a result, the question of how to secure energy supply without generating political, economic or environmental externalities that could lead to large-scale international conflicts has become central for security studies scholarship (Choucri, Ross &

Meadows 1976; Copeland 1996; Deese 1979). Energy resources can also be used as an instrument of national policy or, in other words, as a weapon (Paarlberg 1978). There were legitimate concerns that energy-rich nations may use energy resources to acquire influence abroad – to make other countries do something that they would not otherwise do, or prevent others from doing so, a classical Dahl (1957) definition of power.

Not surprisingly, national governments started to view foreign policy as a tool for meeting their energy needs. As Choucri, Ross & Meadows (1976) put it, 'Increasingly, foreign policy becomes an extension of resource politics'. At the same time, it has also been acknowledged that the attempts to increase energy security could limit foreign policy options because the states would be afraid that their foreign policy decisions unrelated to energy politics could interrupt energy supply and thus undermine national energy security. For instance, the oil crises of the 1970s and the fear that they could happen again have resulted in narrower US foreign policy choices toward the Middle East (Akins 1973; Riggs 1995). Besides, threats to energy security issues may bring new difficulties to the relationships among Western countries since they depend on different energy resources to a different degree. Therefore, even if the United States reduces its reliance on oil imports, it will remain vulnerable through interdependence with allies. Finally, increasing energy prices can cause slower economic growth, higher inflation rates and unemployment in energy-importing countries (Deese 1979; Nye 1980, 1982).

Being a policy-oriented discipline, security studies has been naturally interested in preventing threats to national security and mitigating their consequences. There are several clusters of public policy responses that can reduce the potential vulnerability of energy security systems – both international and domestic.

Military intervention against energy threats has been considered an entirely legitimate solution in security studies. Yet the political and economic costs of such a solution were viewed as being extremely high. Therefore, policy responses usually consider measures other than military. Nonetheless, the modest military presence in energy-rich regions such as the Persian Gulf area, alongside political measures, was viewed as a reasonable energy security instrument (Deese 1979; Lieber 1992; Nye 1980, 1982). More promising was the role of transnational cooperation, especially in the form of intergovernmental organisations for energy security, such as the International Energy Agency (IEA) (Nye 1980, 1982; Yergin 1988).

Responses to threats to energy security are not limited to international responses. In the 1970s, there was a hope that by the end of the 20th century, crude oil would lose its predominance as fuel because of ground-breaking technologies (Akins 1973; Choucri, Ross & Meadows 1976). However, it was not expected

that such a transformation would happen soon. Therefore, certain domestic energy policy responses included energy efficiency and conservation, including the use of tax policies to encourage more efficient use of petrol products; new technologies, such as dual-fired power plants to switch easily from reliance on oil to natural gas or coal; strategic petroleum reserves; and diversification of energy sources – first of all, shifting from oil to natural gas, nuclear energy, coal and renewables (Lieber 1992; Nye 1980; Yergin 1988). Nonetheless, these policies were viewed only as supplementary. The common view was that energy-importing countries could do domestically only a little to reduce their dependency on imported energy resources, at least in a 25-year term perspective. Therefore, the appropriate goal for energy security was not zero oil imports but rather a share of oil in the import that would allow surmounting possible supply interruptions (Akins 1973; Choucri, Ross & Meadows 1976; Deese 1979; Nye 1980, 1982; Yergin 1988).

Material and methods

This study utilises a modified method used by Benjamin K. Sovacool (2014) to analyse research articles published in three major energy journals from 1999 to 2013. The modification for this study included a different sampling technique, new coding categories used in content analysis and different data analysis methods.

Sample

This study defined the population as the security studies academic literature published from 2001 through 2020. For this content analysis, articles were the unit of analysis, and the sample consisted of 43 full-length, peer-reviewed English language research articles representing the population. The articles for the investigation were selected using a purposive two-step sampling technique.

In the beginning, journals were selected based on two criteria. First, international relations journals published in English were selected based on their explicit focus on international security studies according to their title and self-declared editorial aims and scope. Although many reputable international relations journals such as *International Organization*, *Foreign Policy*, *World Politics*, *Review of International Studies*, *International Studies Quarterly* and others regularly publish articles about international security, including energy security, for the purpose of the study they were excluded from the sampling frame.

Second, five journals were identified from the list of the security studies journals based on their academic reputation, which was operationalised as the 2019 Journal Impact Factor (JIF) by Clarivate. As a result, the following five journals

were selected: *International Security* (JIF = 5.432), *Security Dialogue* (JIF = 2.419), *Security Studies* (JIF = 2.167), *Contemporary Security Policy* (JIF=1.880) and *Survival* (JIF=1.241). Articles published in these journals from 2001 to 2020 were considered a sampling frame.

The articles were viewed in electronic format and manually analysed by a single coder without the help of automated tools. The full-length, peer-reviewed articles with a primary focus on any energy issues were selected for further analysis. Commentaries, book reviews, notes, opinions, editorials, letters, viewpoints, corrigendum and similar items were excluded, although special issues and forum exchanges were included. As a result, 43 articles were selected from the five journals for final content analysis (see Table 1).

Table 1. Sample articles by journal and year of publication

Year	Total articles	<i>International Security</i>	<i>Security Dialogue</i>	<i>Security Studies</i>	<i>Contemporary Security Policy</i>	<i>Survival</i>
2001	2	0	0	0	0	2
2002	2	0	0	0	0	2
2003	0	0	0	0	0	0
2004	2	0	0	0	1	1
2005	1	0	0	0	0	1
2006	2	0	0	0	0	2
2007	3	0	1	0	0	1
2008	5	0	0	0	1	4
2009	2	0	0	0	0	2
2010	3	0	1	1	0	1
2011	1	0	0	0	0	1
2012	2	0	0	0	1	1
2013	7	2	1	2	0	2
2014	2	0	1	0	0	1
2015	2	1	0	0	1	0
2016	4	0	0	3	0	1
2017	1	0	0	1	0	0
2018	1	1	0	0	0	0
2019	2	0	0	1	0	1
2020	0	0	0	0	0	0
Total	43	4	4	8	4	23

Data collection

Qualitative and quantitative document content analysis was used as a primary data collection method. The content of all selected articles was viewed in electronic format and analysed by a single coder manually without the help of automated tools. The coding consisted of two major parts – author demographics and article content.

For the author demographic, the following variables were analysed for each article. The number of authors listed in an article was counted for the number of authors. For *institutional affiliation*, we recorded the institution each author provided as their affiliation. If someone listed several institutions, only the first affiliation was recorded. For the *country affiliation* variable, we recorded a country where the institution affiliated with each author was located. For *disciplinary affiliation*, a primary discipline for each author was identified – usually based on the author's primary department and/or position.

In terms of article content, we looked at the following variables:

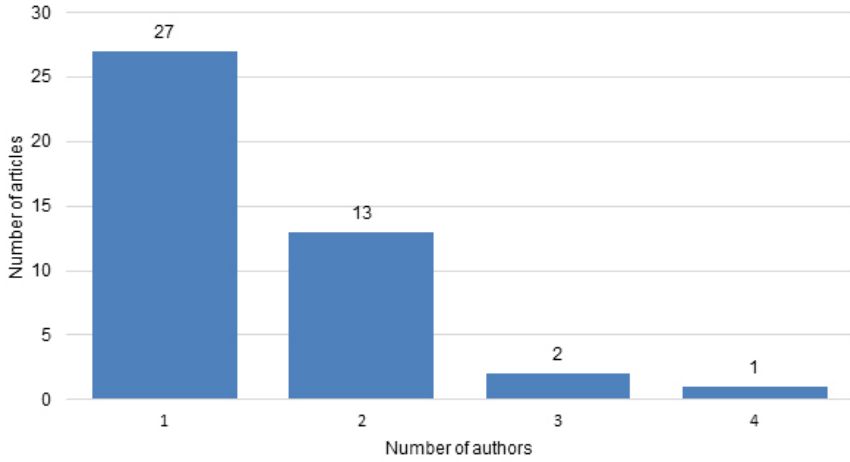
1. We attempted to identify a *type of energy* the article was chiefly focused on for each article. We used five attributes of primary energy: coal, oil, natural gas, nuclear energy and renewables.
2. For *conceptualisation of energy security*, we attempted to identify what concept of energy security the authors explicitly used in their article, whether their own or borrowed from other sources.
3. Four variables were used to catch major *themes* of energy security covered in the analysed articles:
 - a. *Energy security for whom?* For this variable, we attempted to identify from whose perspective energy issues were discussed in an article. Specifically, it identified the unit of analysis – a particular case or entity, such as individual, organisation, state or world system, about which data was collected and a geographical focus of the article.
 - b. *Energy security from what threats?* For this variable, the major sources of threats to energy services or causes of energy crises were identified.
 - c. *Energy security for which values?* We analysed the aspects of society that are specifically affected by threats to energy security were discussed.
 - d. *Energy security by what means?* The actions that the authors offered to prevent threats to energy security or/and mitigate their consequences were analysed.

Results and discussion

Articles distribution and authors demographics

We found no clear trend in the number of articles on energy issues published in the selected journals throughout the two decades. On average, the number of articles remained the same – low. There were years with no articles on energy security for most of the journals (Table 1). Among the journals, only *Survival* demonstrated relatively stable coverage of energy issues. However, we did not calculate the total number of articles for each year in each journal and could not assess the population, sample ratio and the share of the articles on energy compared to other security issues.

Figure 1. Number of authors per article



In terms of the number of authors, in 43 papers analysed, 63 authors were identified in total. Articles with one or two authors prevail, with a clear dominance of solo-authored papers (Figure 1) typical for the international relations field.

When it comes to authors' institutional affiliation, universities and think tanks were authors' primary places of employment (Figure 2).

Even though the authors' institutions are located in nine countries, two-thirds of the authors work for US-based organisations (Figure 3).

In terms of the authors' disciplinary affiliations, political science, including its subdisciplines such as international relations, comparative politics, public policy and security studies, clearly dominated.

Figure 2. Institutional affiliation of the authors

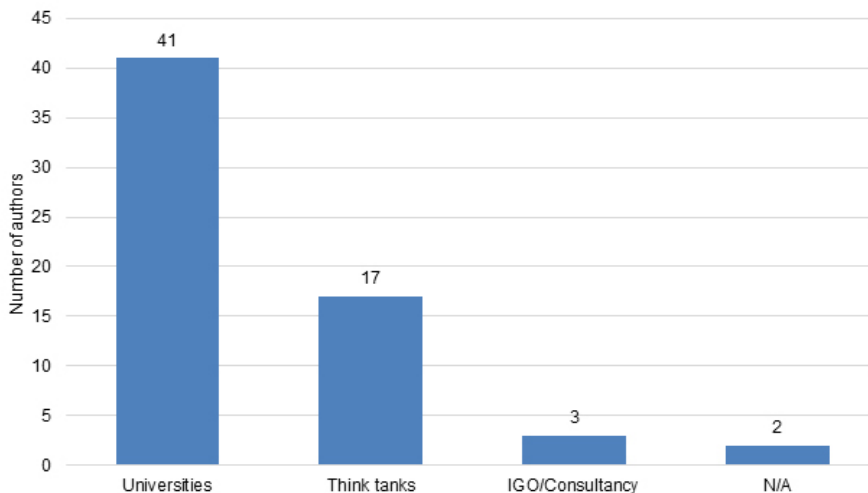
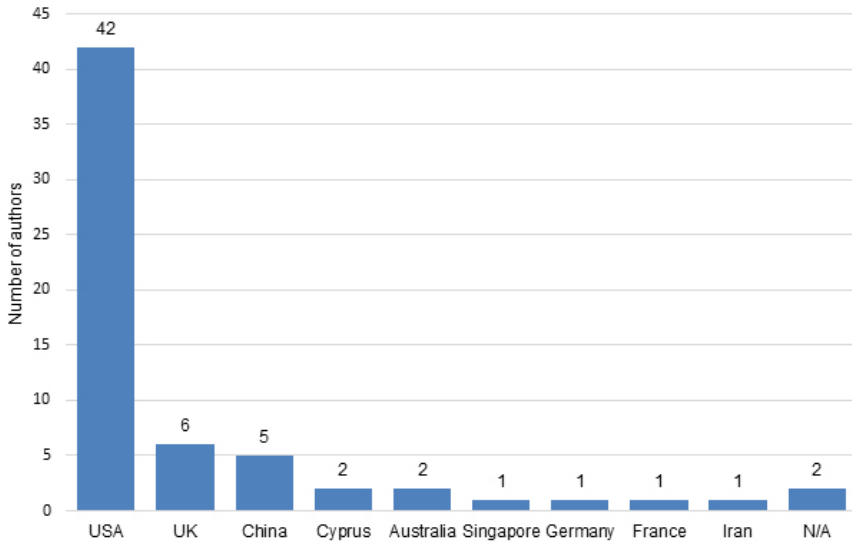


Figure 3. Country affiliation of the authors



Types of energy

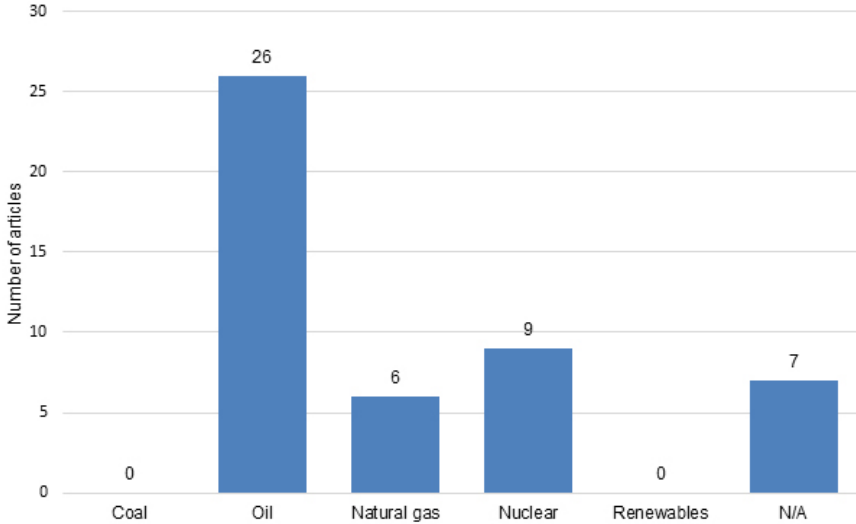
Even though the articles mentioned almost every type of energy resource, they explicitly focused on only three of them – crude oil, natural gas and nuclear power, with an apparent prevalence of oil among them (Figure 4). Moreover, 15 articles explicitly had the word ‘oil’ in their titles – ‘A third Oil Crisis?’, ‘Beijing’s Oil Diplomacy’, ‘The Persian Gulf and the Geopolitics of Oil’, ‘Dismantling the Oil Wars Myth’ are just a few examples. Analogously, six articles had the word ‘nuclear’ in their titles: ‘Making the World Safe for Nuclear Energy’, ‘After Fukushima: China’s Nuclear Safety’ and others. Seven articles either covered all types of energy without giving priority or discussed general issues of energy security that could be applied to any type of energy.

Several articles were concerned with natural gas, and specifically about the stability of its supply and prices from Russia that was addressed in their titles – ‘Russia, Energy and the West’, ‘When Interdependence Produces Conflict: EU–Russia Energy Relations as a Security Dilemma’, ‘Nord Stream II and Europe’s Strategic Autonomy’.

Conceptualisation of energy security

Even though 32 articles out of 43 use the term ‘energy security’ in the main text at least once, only ten explicitly conceptualised the term, either in their own or someone else’s words (Table 2). It would be correct to say that a majority of them shared the traditional, two-dimensional availability/affordability view on energy

Figure 4. Number of articles with a focus on a specific type of energy



security introduced by Deese (1979) and Yergin (1988) and currently supported by the IEA (2020). Yet some authors conceptualise energy security more broadly and consider other dimensions: for instance, the environmental one (Colgan 2013; Kennedy 2010; Peoples 2014).

An article by Ciută (2010) is quite distinct from other papers for its explicit focus on energy security. It offers a comprehensive review of the conceptualisation of energy security in academic literature. It provides a well-reasoned critique of any attempt to come up with a one-size-fits-all definition of energy security. The main argument is quite persuasive – since different actors include different political, economic or environmental considerations into energy security and in different degrees, and, most importantly, use different policy instruments to respond to threats, energy security would inevitably mean different things to the actors. Thus, even though energy is crucial for all sectors of human activity for all actors – or in Ciută’s own words, ‘energy security means the security of everything’ – energy security makes sense only within a context.

Main themes

In this section, we describe the main themes about energy issues we identified in the 43 articles. As explained in Section 2, we divided the themes into four large categories based on which questions they were answering – ‘Energy security for whom?’, ‘Energy security from what threats?’, ‘Energy security for which values?’ and ‘Energy security by what means?’

Table 2. Energy security definitions

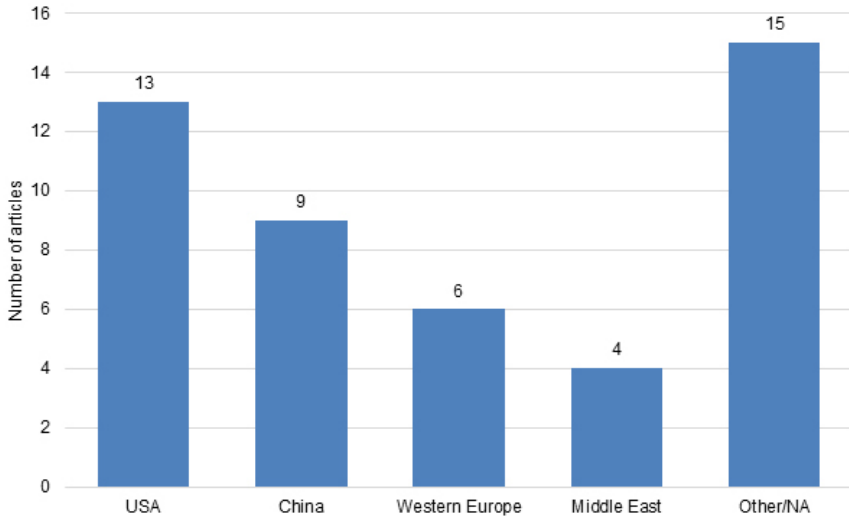
Energy security definition	Article	Source
The level of risk attached to any energy source, foreign or indigenous	(Buchan 2002)	Own
Supply issues, price issues, and systems issues	(Chow & Elkind 2005)	Own
Energy security means the security of everything: resources, production plants, transportation networks, distribution outlets and even consumption patterns; everywhere: oilfields, pipelines, power plants, gas stations, homes; against everything: resource depletion, global warming, terrorism, 'them' and ourselves.	(Ciută 2010)	Own
A condition in which a nation perceives a high probability that it will have adequate energy supplies at affordable prices	(Duffield 2012)	(Deese 1979)
The objective of energy security is to assure adequate, reliable supplies of energy at reasonable prices and in ways that do not jeopardise major national values and objectives		(Yergin 1988)
The ability of states to maintain an uninterrupted supply of energy relative to demand at affordable and relatively stable prices without sudden and significant price increases	(Christou & Adamides 2013)	Adapted from (International Energy Agency 2020; Winzer 2012)
The reliable and affordable supply of energy	(Glaser 2013)	(Deutch, Schlesinger & Victor 2006)
Assured continuity of energy supply, or a situation in which energy products are readily available through the usual commercial outlets and processes	(Noël 2014)	Own
The supply of crude oil or crude products on a state	(Hughes & Long 2015)	Own
The uninterrupted availability of energy sources at an affordable price	(Lind & Press 2018)	(International Energy Agency 2020)

Energy security for whom?

The discussions on energy issues in all articles were explicitly state-centric, with countries as the only unit of analysis. Although the security of the United States still prevailed in the debates, the growth of attention to China's energy security is quite noticeable (Figure 5). However, the single largest category is 'Other / NA',

with 15 of the 43 articles - the geographical focus of the articles is either unclear or they cover global, universal issues of energy security.

Figure 5. Country/region focus of the articles



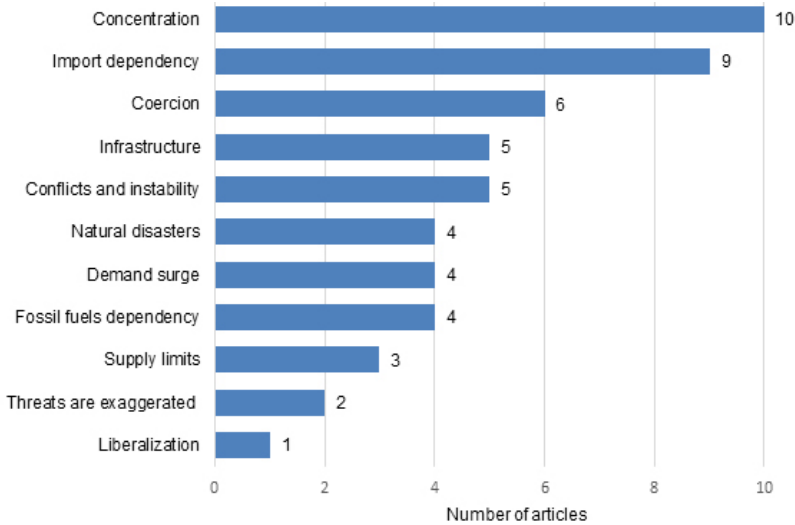
Energy security from what threats?

We identified 11 major topics about sources of threats to energy security, including the absence of such threats (Figure 6).

The **concentration** of energy resources in one or a few hands (monopoly or oligopoly) or in a particular region is viewed as a primary threat to energy security. The strong dependency of Western countries on imported oil from that region has enormously enhanced the power of energy cartels that can deliberately restrict energy supply by not utilising existing extraction capacity or by underinvesting in it (Jaffe, Klare & Elhefnawy 2008; Levi 2013; Lind & Press 2018; Salameh 2001). Some authors emphasise the role of market power of oligopolistic energy actors and their alliances, such as OPEC.

For instance, OPEC was operating at 99% of its total crude oil productive capacity at one point. Even though the cartel was not the only oil producer in the world, because of the absence of free capacity, even a slight increase in demand or supply decline could generate a world energy crisis. Even though the total energy supply disruption is unlikely in such a situation, the price spike can be significant (Jaffe, Klare & Elhefnawy 2008; Levi 2013; Lind & Press 2018). Also, in their responses to threats to their energy export caused by new energy sources, such as shale oil, cartel members can jeopardise the energy security of oil importers (Noël 2016). Yet some authors acknowledge that compared to the 1970s,

Figure 6. The number of articles covering specific threats to energy security (or their absence)



cartels' role in oil world markets has significantly declined because of new players such as Russia (Jaffe & Manning 2001). Yet new energy exporters often use 'resource nationalism' – an attempt of governments in those countries to control their energy sectors (Bremmer & Johnston 2009). Threats to energy security can be caused by geographical concentration too. The regional concentration enhances the risk from natural disasters and regional instabilities (Lind & Press 2018). Finally, a dangerous concentration can exist within energy-importing countries as well. For instance, national energy resources can also be concentrated geographically. Therefore, relying on a single type of energy, even the domestic one, can still threaten national energy security (Chow & Elkind 2005; Noël 2014).

Dependency on imported energy resources (**import dependency**) – crude oil, and especially dependence on imports from distant regions such as the Middle East – is viewed by many authors as a potential threat to energy security. Currently, import dependence is viewed as a common issue for many countries, including the United States (Barnes & Jaffe 2006; Chow & Elkind 2005; Duffield 2012; Jaffe & Lewis 2002), Western Europe (Duffield 2012; Krickovic 2015) and China (Barnes & Jaffe 2006; Daojiong 2006; Jaffe & Lewis 2002; Kennedy 2010; Lind & Press 2018). Many papers emphasise that imported energy supplies are not a threat to national interests *per se* but because of the energy supply disruption caused by either human or natural factors, such dependency can become a severe threat to national security. This threat is especially real when most of the nation's oil imports enter the country through narrow transit routes such as straits or a small region such as oil ports in the Gulf of Mexico (Chow & Elkind 2005).

At the same time, other authors argue that countries should not care about where they get their oil because energy consumers can receive energy freely through market mechanisms. They claim that there is little historical evidence to support the claim that imported energy is less secure than domestically produced (Clayton & Levi 2012). Many crises were caused by domestic factors such as domestic infrastructure failure because of natural or human factors or strikes at domestic energy facilities. These authors argue that energy resources improve the diversification of suppliers and positively contribute to national energy security (Chow & Elkind 2005; Noël 2014).

The fear that energy can be used for **coercion** as an instrument of foreign policy is viewed as a real issue in security studies. Countries dependent on energy imports fear that someday an energy exporter will make them an offer they cannot refuse because the consequences of energy disruption will be destructive to their economy and military capabilities. Energy producers can use energy coercion through embargos and production cuts, but also by transit and third countries that can interrupt the energy supply by military means. The potential for coercion varies significantly across different stages of the energy supply chain (Burrows & Treverton 2007; Christou & Adamides 2013; Hughes & Long 2015; Kelanic 2016; Lind & Press 2018; Noël 2019).

Unreliable or poorly designed **infrastructure**, both the physical energy systems and the institutional framework that enables these systems to work, is another threat to energy security. The 2000–2001 California electricity crisis demonstrated that the national energy systems can still be vulnerable even without disrupting the foreign energy supply. Similarly, in 2005, Hurricane Katrina exposed critical issues in US energy infrastructure (Chow & Elkind 2005; Noël 2014). The issue of energy infrastructure is not unique to the United States, though. For instance, China experiences difficulty in proper management of energy systems (Daojiong 2006), and France is concerned about its aging nuclear infrastructure (Duffield 2012).

International and domestic **instability**, such as interstate **conflicts**, civil wars, insurgency, terrorism, and riots in energy-rich or transit areas, threatens energy security. For example, the permanent instability in the Middle East is viewed as the main risk to the stability of supply from that region (Barnes & Jaffe 2006).

Natural disasters such as hurricanes or earthquakes can also provoke energy crises. The major problem is a flawed infrastructure that makes a national energy system vulnerable during disasters (Chong 2013; Chow & Elkind 2005; Noël 2014; Tertrais 2011). For instance, about 60% of US national oil imports enter the country through the relatively small coastal region, and more than 50% of oil refineries are located along the Gulf of Mexico.

Even though studies of import dependency are generally focused on the **dependence on fossil fuels**, primarily crude oil and natural gas, some authors emphasise that fossil fuels threaten energy security, whether domestic or not. Dependence on fossil fuels is viewed as risky because of their finite amount on earth and the environmental effects of their combustion (Chow & Elkind 2005; Jaffe, Klare & Elhefnawy 2008; Kraemer 2008; Peoples 2014).

Another factor that threatens energy security is **energy supply limits** to markets. Whether the world will experience a shortage of fossil fuels in the short term has been central to the debate on energy security, especially in the early 2000s. Some articles predict a global deficit of fossil fuels because the cost of developing new energy reserves is rising quite slowly (Elhefnawy 2008). Other authors, however, criticise the view, arguing that the peak oil theory has been misleading and negatively affected national security policies (Jaffe, Klare & Elhefnawy 2008; Stern 2016). At the same time, other authors emphasise that the real problem is not physical oil reserves underground but rather the capacities of the oil industry to extract and deliver (Maloney 2008).

One of the threats to energy security that is often mentioned is the global imbalance between the supply and demand of energy resources (**demand surge**), particularly in the case of crude oil. Simultaneously, the world energy demand is increasing. Many authors connect it with rapid economic growth, especially in the Asia-Pacific region, and predict that such a misbalance could threaten energy security (Daojiong 2006; Maloney 2008; Noël 2014; Salameh 2001).

Even though control of energy resources by a few actors, especially by external or foreign actors, is viewed as a clear threat to energy security, the deregulation and **liberalisation** of energy systems and markets can also be a threat. For example, the liberalisation of energy systems can jeopardise the prospects for long-distance importing of natural gas because this type of energy requires long-term contracts requiring governmental guarantees. Second, renewables and other alternative energy sources become less competitive against traditional energy sources (Buchan 2002).

In addition to the 10 threats to energy security identified in the reviewed articles, some authors believe the **threats to energy security are imaginary, exaggerated**, or do not exist. For instance, the liberal school of economics argues that energy consumers can receive energy freely through market mechanisms, and, therefore, essentially, the threat to energy security is mostly imaginary (Stern 2016; Stulberg 2004).

Energy security for which values?

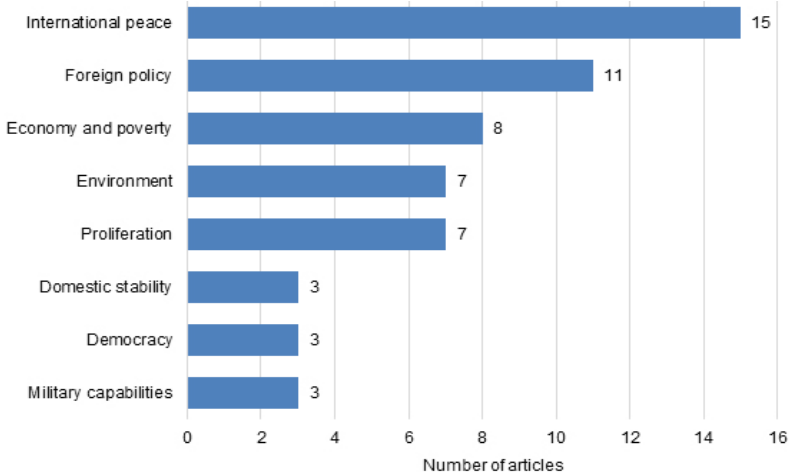
The study identifies eight main themes about the possible impact of energy security threats (Figure 7), which are elaborated below.

One of the most popular topics in security studies is the relationship between energy and armed conflicts (the issue of **international peace**). Because of the threats to energy security, states can choose to use military force to supersede market mechanisms by physically preventing oil imports from reaching the target, either by controlling energy resources or their transit routes (Kelanic 2016), which can potentially result in full-scale military conflict. Even though the threat of energy resource wars is often exaggerated (Jaffe, Klare & Elhefnawy 2008; Noël 2014), the political effects generated by the energy industry are viewed by many researchers as a cause of conflicts in the 21st century, either directly or indirectly (Ciută 2010; Colgan 2013; Salameh 2001).

There are several pathways through which concerns about energy security can result in conflicts. First, vulnerable energy supplies make states' militaries vulnerable; when states already have incentives for conflict, oil vulnerability can influence the assessment of adversaries' military capabilities and, therefore, provoke an interstate conflict. Second, energy reserves, or perceived energy reserves, increase the value of territory and encourage countries to engage in territorial conquests since the payoffs of such resource wars are perceived as being higher than the risks associated with them (Glaser 2013).

Both energy exporters and importers are also concerned about transit routes and aim to control them, resulting in increased tension (Jaffe & Manning 2001). Most importantly, each party can misinterpret the intentions of the other parties producing a so-called 'security dilemma'. As a result, when energy importers are concerned about outcomes of territorial conquests, control over transit routes and access to energy and its costs, they can decide to intervene (Burrows & Treverton 2007; Colgan 2013; Elhefnawy 2008; Glaser 2013; Kennedy 2010;

Figure 7. The number of articles covering specific targets the threats can affect



Noël 2019). At the same time, direct and indirect costs associated with such interventions inevitably reduce the payoffs of seizing energy resources and would make such options extremely risky (Meierding 2016). Thus, countries facing similar threats to energy security could decide to cooperate rather than engage in wars for the energy prize (Stulberg 2004). The imbalance between supply and demand would likely result only in a change in price but not in any armed conflicts. Thus, according to some scholars, the chances of oil wars are exaggerated (Meierding 2016; Noël 2014).

Energy can affect international peace in other ways as well. For instance, energy exporters can decide to use oil money for rearming and challenging other countries (Jaffe & Manning 2001). On the other hand, because of the collapse of energy prices, reducing incomes from energy sources can result in the desire of leaders of energy countries to start wars (Bremmer & Johnston 2009). At the same time, energy importers can provide weapons and military services to energy exporters in exchange for the stability of the energy supply.

There are undoubtedly connections between the oil trade and international politics, whether by geography, perceptions or producers' strategies. Concerns over energy security inevitably shape states' **foreign policy**, encouraging politicians to step in to prevent or mitigate threats to energy security. That applies both to energy-importing and energy-exporting states (Clayton & Levi 2012). For instance, dependence on foreign oil has shaped US policy toward the Middle East for decades (Barnes & Jaffe 2006). It determines the relationships of Russia with neighbouring countries and NATO because of the centrality of goals to maximise energy revenues (Burrows & Treverton 2007; Jaffe & Manning 2001; Stulberg 2004) and China's interest in the Middle East (Jaffe & Lewis 2002). The problem is that energy dependence can invite demands for political accommodations in exchange for stable energy supplies, demand or transit (Colgan 2013; Elhefnawy 2008; Jaffe & Lewis 2002; Kim 2019). Even though energy security issues are unlikely to cause military conflict, the risk of such conflict prevents strategic cooperation. For example, oil dependence reduces states' willingness to cooperate on shared security concerns (Colgan 2013; Noël 2014). Yet the link between the oil trade and political relationships has changed substantially compared to the 1970s and 1980s (Clayton & Levi 2012).

Even though security studies traditionally view the economy through the military prism, many authors emphasise how energy affects economies for energy-exporting (Jaffe & Manning 2001; Maloney 2008; Moshirzadeh 2007; Noël 2016) and energy-importing (Elhefnawy 2008; Meierding 2016) countries. This points to the issues related to **economy and poverty**. The effects of energy price surges are especially crucial for developing countries whose economies can collapse while developed countries experience just a moderate slowdown (Burrows

& Treverton 2007). Undoubtedly, economic difficulties can increase the probability of international conflicts – energy-related threats easily extend from the economic sector into the military and political ones that can result in decreased military capabilities or the political instability discussed above (Burrows & Treverton 2007; Christou & Adamides 2013).

The problem of acquiring weapons of mass destruction by governments, organised groups and individuals – often referred to as horizontal **nuclear proliferation** – is one of the central topics in security studies. It is often argued that the threats to energy security can increase the risks of nuclear proliferation (Acton 2009; Chong 2013; Deutch et al. 2004; Elhefnawy 2008; Pandza 2013; Tertrais 2011). Because of the concerns over uninterrupted energy supply, countries can decide to pursue nuclear energy. One problem is that the ‘commercial’ plutonium fuel can be used for a nuclear weapon. The related problem is that energy-importing countries can provide nuclear and other weapons of mass destruction or technologies to other countries to secure their energy supply (Salameh 2001).

Finally, one of the negative externalities of energy use is its **environmental** effects. For fossil fuels, it is primarily air pollution and global climate change (Burrows & Treverton 2007; Jaffe, Klare & Elhefnawy 2008; Kennedy 2010; Kraemer 2008; Peoples 2014), and for nuclear power, there are concerns about power plants’ safety and radioactive waste storage (Chong 2013; Tertrais 2011).

Similarly, energy, especially oil, can create conditions for domestic conflicts that lead to state failure and/or foreign intervention (the **domestic stability** issue). Energy resources can create economic inequality, inadequate institutions, political instability and environmental issues (Colgan 2013; Elhefnawy 2008; Tang, Xiong & Li 2017).

Some authors emphasise the linkage between resource wealth and **democracy**. For instance, in petrostates, extensive income from energy exports can reduce the domestic accountability of leaders (Burrows and Treverton 2007; Colgan 2013; Maloney 2008). Thus, energy, specifically energy rent, can affect liberal reform and democratisation.

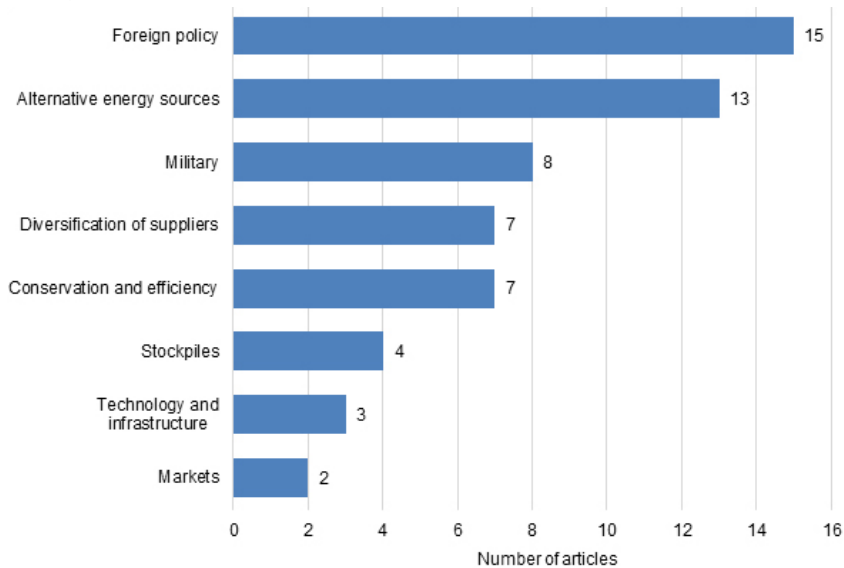
Even though the importance of petrol products for the **military** is acknowledged, the scenario in which militaries of contemporary states lack petrol products to the degree that it affects their capabilities – the shortage of fuel for aircrafts, tanks, vehicles and vessels – is not viewed as a very real threat for most of the countries. Energy is crucial for the military – most land and air vehicles depend on petroleum products. Even though some military marine vessels use nuclear propulsion, many also need petroleum products. As a result, there are no viable substitutes for petrol products for military purposes. Thus, militaries that lack access to oil resources cannot function effectively. Therefore, vulnerable

energy supplies make states' militaries vulnerable – denying oil to an adversary in wartime could paralyse its forces and threaten it with defeat (Glaser 2013; Kelanic 2016; Meierding 2016).

Energy security by what means?

The study identifies eight major themes about possible actions to prevent or mitigate energy security threats, including an absence of any actions (Figure 8).

Figure 8. The number of articles covering specific means aiming to mitigate threats to energy security



International cooperation is viewed as a more promising solution to threats to energy security than the military. Many authors emphasise the role of active diplomacy in increasing national energy security (**foreign policy** means). The reliance on imported energy encourages countries to spread their diplomatic activities to wherever they would help. Forms and strategies of foreign policy vary, but they can include cooperation in energy trade and energy technology with the ultimate goal of creating a transparent global energy system (Chow & Elkind 2005). Energy cooperation can include bilateral and multilateral agreements regarding energy security among energy importers, not only among Western countries regarding whether they should release emergency oil inventories, but also strategic energy cooperation between such countries as the United States and China (Barnes & Jaffe 2006; Burrows & Treverton 2007; Chong 2013; Clayton & Levi 2012; Glaser 2013; Jaffe & Lewis 2002; Kelanic 2016; Kraemer 2008). Quite similarly, cooperation with energy exporters would positively contribute

to the energy security of energy importers (Clayton & Levi 2012; Jaffe & Lewis 2002; Jaffe & Manning 2001; Kennedy 2010; Kim 2019; Lind & Press 2018; Maloney 2008; Noël 2016). However, the views on formal intergovernmental organisations such as IEA in achieving energy security are more sceptical. Although all countries have a common interest in energy security, their specific needs and options may differ significantly. Even in the 1970s, when many countries had shared concerns about the stability of oil supply from the Middle East, they cooperated to a minimal extent (Duffield 2012).

Traditionally for security studies, **military** response to threats to energy security or to prevent such threats is viewed as a legitimate mechanism. Yet the certainty of use of the military for energy security varies significantly among articles. Most articles view military action against energy security threats as ineffective, costly and, therefore, unlikely. Others concede the possibility of using the military as a last resort. They argue that a hypothetical closure of the Strait of Hormuz would result in an immediate US military response to make it open. Other countries, such as China, also boost military capabilities to protect energy transportation routes because their oil imports are vulnerable to military disruption. Because of increasing tensions between the United States and China around energy issues, claims could increase the role of the military in this matter (Glaser 2013; Hughes & Long 2015; Jaffe, Klare & Elhefnawy 2008; Kelanic 2016; Kennedy 2010; Lind & Press 2018). Yet it is more likely that the military responses of major powers would be limited by non-combat actions such as peacekeeping. Moreover, the military implication of energy security does not necessarily mean sending the troops overseas but may include increasing military ties with energy-rich countries and supplying arms and military services to them in exchange for friendly energy policies (Elhefnawy 2008; Kim 2019).

Other authors argue that the oil market does not depend on the United States' military presence in oil-rich regions (Gholz & Press 2013). The pursuit of energy security through military actions costs a higher price than other means. As Nader Elhefnawy has put it in a rhetorical question, 'What might the United States have accomplished if it put even a small fraction of the money spent on securing the Persian Gulf since 1973 into developing alternative energy sources?' (Jaffe, Klare & Elhefnawy 2008: 79).

The foreign policy responses often overlap with another strategy to minimise risks to energy security – a **diversification of energy suppliers**. Indeed, as discussed above, energy producers' market power is a major threat to national security. For instance, China is looking for new energy suppliers in the Middle East and Central Asia (Jaffe & Lewis 2002; Kennedy 2010). In addition, diversification of energy supply routes is not limited by suppliers only. For China, for instance, a so-called 'Malacca Dilemma' exists – the threat that the United States would

block energy passing through the Malacca Strait to China. China attempts to minimise that threat by building pipelines from Central Asia and Russia (Lind & Press 2018; Noël 2014). Analogously, European countries are attempting to diversify their energy markets and transit routes to break Russian control over its natural gas supply (Krickovic 2015), and the United States traditionally attempts to solve the problem of diversification of suppliers through the increase of local energy production (Chow & Elkind 2005; Elhefnawy 2008).

Diversification of suppliers comes hand in hand with the diversification of energy sources. Since the primary concern is the dependency on oil, **alternative energy sources** such as shale oil, coal, natural gas, nuclear power and renewables are viewed as another solution for energy security issues (Chow & Elkind 2005; Duffield 2012; Fair & Shellman 2008; Jaffe & Lewis 2002; Kelanic 2016; Kennedy 2010; Kraemer 2008; Moshirzadeh 2007; Peoples 2014; Tertrais 2011). At the same time, there are some sceptical views on alternative energy sources regarding unconventional oil (Elhefnawy 2008; Noël 2016; Salameh 2001).

Domestic energy **conservation and improving energy efficiency**, especially concerning oil, are important public policies for improving energy security. A country with lower energy intensity will be less vulnerable to energy shocks (Chow & Elkind 2005; Duffield 2012; Glaser 2013; Kelanic 2016). Yet it is crucial to promote energy efficiency domestically and abroad, especially in developing countries (Jaffe, Klare & Elhefnawy 2008). Even though the energy efficiency of economies in Western Europe and Japan has drastically improved, in other countries such as China, the critical threat is the growing consumption of energy resources without significant progress in energy efficiency (Daojiong 2006).

Like conservation and efficiency, a more reliable and efficient **technology and energy infrastructure** is essential for improving energy security (Chow & Elkind 2005; Kennedy 2010). It includes technological improvements and more effective institutions (Daojiong 2006).

Some authors emphasise the limitations of diversification and technological advances for replacing imported oil in the national energy mix. Therefore, strategic **stockpiles** remain essential for achieving energy security (Gholz & Press 2013; Glaser 2013; Kelanic 2016; Lind & Press 2018).

Finally, there are some views that energy security problems can be solved without policy responses – through market adaptation (the importance of **markets**). Nonetheless, it is acknowledged that even though markets can adjust to small threats, serious accidents can exceed the market's ability to adapt and, therefore, will result in a significant price surge. These accidents include consolidation of Middle Eastern oil reserves, on the one hand, domestic instability in Saudi Arabia or other oil-exporting countries, or disruption of transit through

crucial export straits such as the Strait of Hormuz or the Strait of Malacca (Gholz & Press 2010; Levi 2013).

Conclusions

The five leading security studies journals analysed in this study cover energy issues in security studies over the past twenty years. Although many reputable journals with a broad international relations focus, such as *International Organization*, *International Studies Quarterly* and *European Journal of International Relations*, were not included in the sample, we believe that the study still offers a significant amount of information on energy issues in security studies over the past twenty years.

Security studies do include various energy issues in their scholarship. Yet it must be admitted that the coverage of energy issues in security studies journals has been relatively low and sporadic. Most authors used approaches and methodological tools typical for security studies – typically neorealist qualitative, secondary-sources studies.

Energy issues are discussed in security studies specifically from a state-centric perspective only. Even though there has been an increased interest in human security in the last two decades, the analysed articles do not address energy security from a human security perspective.

Furthermore, the debates remain predominantly Western- and, first of all, US-centric. Even though the number of articles on energy security in other countries, including China, is noticeable, the accusation of security studies as 'being written largely by Westerners and for Western governments' (Hampson 2013) can be applied to energy security in security studies well.

Energy debated in security studies remains oil- and nuclear-centric. Even though some articles address the diverse nature of energy threats to energy security for different countries, the US-centric focus of the debates about energy security still keeps the half-a-century-old concerns over high oil prices or/and a heightened risk of oil supply disruptions from the Middle East and risk associated with nuclear proliferation. It is hard to deny that oil remains the lifeblood of modern transportation and warfare. One might argue maybe there is a good reason why the research on energy security has focused consistently on the same topics – because the real world reflects that consistency. Yet it should be admitted that natural gas, specifically the ongoing EU-Russia gas crisis since the mid-2000s, despite its rich empirical ground for scholarly debate, has been reflected superficially in analysed mainstream security studies journals.

Even though energy security is not viewed only through the prism of military security, the military discourse, especially about the role of energy in provoking interstate and domestic armed conflicts, prevails as it did 40–50 years ago.

The environmental dimension of energy security, such as pollution and global climate change, with a few exceptions remain neglected in academic security studies literature.

Quite similarly, the potential governmental responses to energy security threats have not changed much. They include diversification of suppliers and energy sources, domestic energy efficiency and stockpiles, and an active foreign policy, focusing on bilateral agreements rather than intergovernmental organisations.

There is a clear explanation for that – despite its historical importance, energy security has not been considered to the full extent to be part of security studies. Even though security studies is a dynamic field that has expanded its scope significantly in the past twenty years, energy issues remain a largely underexplored area within at least major mainstream security studies journals.

Yet it should also be admitted that the conclusion about the Western- and especially centric debates about energy in security studies is quite possibly an artifact of selection bias (i.e., the choice of which journals to study) rather than the whole field. For instance, several journals such as *Journal of Peace Research*, tend to focus on (1) quantitative data, (2) nonstate actors and (3) non-US perspectives. Therefore, the increasing number of international relations and security studies journals, both mainstream and those that consciously try to adopt less mainstream approaches to studying security, such as human security or geopolitics for content analysis, looks like a logical and promising direction for further research.



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