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Araştırma Makalesi

RETHINKING AND RECONCEPTUALIZING ENERGY SECURITY: THE CASE OF CHINA[1]

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Abstract

This study examines the concept of energy security and proposes an alternative paradigm in the context of the climate crisis. In this context, the presuppositions of mainstream and contemporary approaches towards energy security in International Relations discipline will be examined and formulated in four sorts of approaches as realist, liberal, environmental and human security. These approaches will be classified as traditional and contemporary energy security paradigms. This study contends that the connection to realist and liberal approaches is the predominant strategy in the field of energy security and for this reason, the relationship between energy and security needs to be reconceptualized. Although environmental and human security approaches have been effective in deepening the boundaries of energy security, a critical perspective is necessary for both mainstream and contemporary energy security paradigms. In this regard, the focus will be directed to the energy security policies of China to accentuate problematic aspects of the contemporary energy security paradigm. Then, the concept of planetary security as normative and interdisciplinary framework for the energy security policies, which have been in search of a paradigm, will be proposed.

Keywords**:** *Energy, Realist and Liberal Theories, Parameters of Energy Security, China, Planet Politics.*

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ENERJİ GÜVENLİĞİ ÜZERİNE YENİDEN DÜŞÜNMEK VE KAVRAMSALLAŞTIRMAK: ÇİN ÖRNEĞİ[2]

Öz

Bu çalışma, enerji güvenliği kavramını incelemekte ve iklim krizi bağlamında alternatif bir paradigma önermektedir. Bu bağlamda enerji güvenliğine yönelik Uluslararası İlişkiler disiplinindeki ana akım ve çağdaş yaklaşımların ön kabulleri incelenecek ve realist, liberal, çevresel ve insan güvenliği olmak üzere dört çeşit yaklaşımda formüle edilecektir. Bu yaklaşımlar, geleneksel ve çağdaş enerji güvenliği paradigmaları olarak sınıflandırılacaktır. Bu çalışma, realist ve liberal yaklaşımlarla bağlantının enerji güvenliği alanındaki hâkim strateji olduğunu ve bu nedenle, enerji ve güvenlik arasındaki ilişkinin yeniden kavramsallaştırılması gerektiğini ileri sürmektedir. Çevresel ve insan güvenliği yaklaşımları, enerji güvenliğinin sınırlarını derinleştirmede etkili olmuş olsa bile hem ana akım hem de çağdaş enerji güvenliği paradigmaları için eleştirel bir yaklaşım gereklidir. Bu bağlamda çağdaş enerji güvenliği paradigmasının sorunlu yönlerini vurgulamak için Çin'in enerji güvenliği politikalarına odaklanılacaktır. Akabinde, iklim krizi bağlamında bir paradigma arayışı içerisindeki enerji güvenliği politikaları için normatif ve disiplinlerarası bir çerçeve olarak gezegensel güvenlik kavramı önerilecektir.

Anahtar Kelimeler: *Enerji, Realist ve Liberal Teoriler, Enerji Güvenliğinin Parametreleri, Çin, Gezegensel Siyaset.*

INTRODUCTION

The conceptualization of energy security policies has been intertwined with realist and liberal understandings in International Relations (IR) theories. For this reason, attention has usually been directed to state-centric, strategic and market-driven approaches, albeit the environmental insecurities that disseminate throughout the world. Energy policies have predominantly followed a dichotomous path regarding the interactions between traditional and contemporary security-oriented implications. Therefore, energy policies could not provide a comprehensive and coherent framework with concern to the security of the planet.

The absence of the planetary perspective, normative references and social emphasis could not be overcome at the nexus of the traditional and contemporary energy security paradigms. For this reason, the development of alternative approaches has become inevitable in the context of the climate crisis. In this regard, the idea is that applying the concept of planetary security may be valid to undermine the adverse impacts of the narrow conceptualization of the energy

[2] Bu çalışma, İstanbul Teknik Üniversitesi Siyaset Çalışmaları Yüksek Lisans Programı'nda 2020 yılında tamamlanan "Gezegen Güvenliğini Anlamak: Enerji Güvenliği ve İklim Krizine Yaklaşımda İnsan Ötesi Bir Paradigma" başlıklı yüksek lisans tezinden üretilmiştir. Bkz: Aktan, Ö. (2020). *Understanding Planetary Security: A Post-humanist Paradigm in Approaching Energy Security and Climate Crisis* (Yüksek Lisans Tezi). İstanbul Teknik Üniversitesi, Sosyal Bilimler Enstitüsü. Yükseköğretim Kurulu Ulusal Tez Merkezi (Tez No. 629559).

security in IR theories. The concept of planetary security has been extracted from the study, titled as "Planet Politics: A Manifesto from the End of IR" (Burke et al., 2016). In this spirit, the purpose of this study is to develop a new paradigmatic approach to redefine and reconceptualize energy security in terms of philosophy, politics and science, and to raise critical awareness of planetary security.

There have been endeavors to situate and to reinvigorate the concept of energy security in IR theories. Environmental and human security studies, in this respect, have been effective in addressing the climatic, humane and social aspects of energy security. But still, energy security in IR could not transcend beyond the coexistence of the mainstream and contemporary approaches. Therefore, the motivation in this study is to challenge the taken-for-granted and dichotomous assumptions about energy security in the context of the climate crisis.

This study argues that energy security has been conceptualized in four perspectives. The core underpinnings of realist, liberal, environmental and human security perspectives have been applied for the linkage between energy and security. But the emphasis on realist and liberal mainstream security approaches has been the strongest and decisive orientation. This orientation might be classified as the traditional or mainstream energy security paradigm. The impacts of environmental and human security perspectives on energy security policies might be classified as the contemporary energy security paradigm.

An investigation about energy security in IR theories is critical to accentuate the need for the alternative paradigms, including the concept of planetary security, and to overcome oversimplifications and dichotomous mindsets. In this regard, this study adopts a skeptical, critical and normative perspective for the human-centric emphasis of environmental and human security studies in the context of energy security. Because human-centric emphasis on the formulation of energy security policies may encourage instrumental consideration of nature. For this reason, this study asserts that the contemporary energy security paradigm, which has been exemplified by environmental and human security studies, may pose a danger due to the prioritization of the human entity. Valuation and preservation of nature and global environment for the satisfaction of human beings and continuity of economic activities may intensify the instrumental and exploitative approach towards nature and may reproduce traditional approaches.

Environmental and human security studies have provided greater prominence about the almost non-existence presence of the moral and social aspects of energy security. But the contemporary energy security paradigm demonstrates a threat regarding the recurrence of the instrumental and exploitative relationship between human beings and nature, which can not be isolated from energy policies. The People's Republic of China (hereinafter, China), as a case study, is chosen to examine the relationship between fossil fuel-based and hybrid-planned energy policies.

Economic growth in China has been actualized and consolidated through fossil fuel-based policies. The adoption of hybrid-planned energy policies, dissemination of the Renewable Energy Sources (RES) and technological developments do not eliminate fossil fuel-based policies in China. Therefore, focusing on China may be important in demonstrating the continual role of the military advancement and economic growth on the contemporary energy security paradigm, in transcending beyond the coexistence of the mainstream and contemporary energy security paradigms and in emphasizing that mere technological development cannot be sufficient in raising ethical awareness towards the impacts of the climate crisis.

THE SOCIO-LINGUISTIC TRANSFORMATION OF THE WORD 'ENERGY'

Energy contains significant meanings for all aspects of life and academic disciplines. The transfer and transformation of energy resources have been critical for the well-being of human beings and nations. But concurrently, the linkage between energy; human beings and nations has resulted in severe humane, sociological and environmental degradations. Lindsay classifies these degradations in terms of the inequalities and injustices in the distribution of the available energy resources and environmental degradations, including water and air pollution (Lindsay, 1971, pp. 383-384).

The constructed linkage between energy and development is not strictly progressive and is mainly treated separately from the humane and environmental implications. In *Energy Security, Equality and Justice*, Sovacool, Sidortsov and Jones argue that the global energy system is problematic in terms of environmental insecurities, injustices, and inequalities. The environmental and social problems about energy security have been explained as follow: Climate crisis and degradation of the environment due to deep attachment to the fossil fuels (Sovacool, Sidortsov and Jones, 2014, pp. 2-5); inadequate access to the energy resources and services; unequal distribution of the costs and benefits of the energy resources, and exclusionary energy decision-making processes (Ibid, 2014, p. 13). Therefore, it is argued that fossil fuel-based global energy system conflicts with justice; obstructs conditions for equality and sustainability; disregards moral compass (Ibid, 2014, pp. 21-22).

Engaging with the philosophical framework as a guidance has thus been addressed in the context of energy-related issues and energy justice (Sovacool, Sidortsov and Jones, 2014, p. 29). The philosophical significance of energy has been addressed to appreciate its roots and historical evolution (Lindsay, 1971, p. 384). In this regard, it is important to provide philosophical and normative perspectives to reinvigorate the concept of energy security in IR and to contribute to planetary awareness. The idea is that industrial developments have undermined the philosophical understanding of energy. For this reason, it is important to focus

on the differences between pre-industrial and industrial times through the socio-linguistic transformation of the word 'energy'.

In the Cambridge Dictionary, the word 'energy' implies the notions of activity and power (Cambridge Dictionary, n.d.). However, the concept of energy has deeper meanings and dimensions. The argument is that perspectives about energy in pre-industrial times have emphasized a connection between planet and politics with a concern to the genesis, change and movement in nature and universe (e.g. Aristotle & Reeve, 2016). But industrial times have emphasized materialistic, technical and instrumental perspectives about energy in terms of work, production, heat, force, power and alienated it from its philosophical constitution. In this regard, industrial developments and energy transitions in human societies have affected the explanations that dominate the definitions of energy (e.g. Stiegler, 2016, pp. 182-198).

There are conceptual and materialistic orientations to define the concept of energy. From a conceptual perspective, abstraction of energy has been about the notion of work, principle of conservation and has been evaluated *"as capacity for doing work"*. From a materialistic perspective, energy has been evaluated *"as a kind of fluid which travels through machines and along wires"* (Warren, 1982, p. 295). But evaluating energy and work as equal is incorrect (Ibid, 1982, pp. 295-297). Defining energy *"as the ability or capacity to do work"* was problematized due to the negligence of the reasons for the energy availability problems in societies (Lehrman, 1973, p. 15).

The reasons to object to the classical definition of energy have been justified through the rules of thermodynamics (Lehrman, 1973; Sexl, 1981). Defining energy as *"'the capability of a system to perform work'"* is not correct in the context of the rules of thermodynamics. The classical definitions of energy confirm the failure of the conceivable and operational perspectives for the study of energy. Therefore, a deeper understanding and historical perspective about the conceptual development of energy have been emphasized (Sexl, 1981, pp. 287-288).

It has been asserted that the operational perspective about energy is not compatible with the laws of thermodynamics and leads to confusions about the notion of work as well. It has been stated that *"(...) the internal energy of a system cannot be transformed completely into work"* (Sexl, 1981, p. 287). Therefore, understanding the importance of energy transfer is critical in understanding the differences between energy and work and in appreciating the role of energy. It has been asserted that *"the definition of energy as the ability or capacity to do work"* is invalid (Lehrman, 1973, p. 15), since there is irretrievable loss on the ability or capacity to do work at the each energy conversion processes, which is the second law of thermodynamics (Ibid, 1973, pp. 17-18) and in contrast to the first conservation law of thermodynamics, in which the classical definition of energy has been rooted (Ibid, 1973, p. 16). Paradoxically, the emergence of the first law of

thermodynamics -which allowed to define the properties of energy- has produced hesitations about the validity of the classical definition, since *"the ability or capacity to do work"* is not conserved (Ibid, 1973, pp. 16-17).

The classical definition of energy is not completely compatible with the first law of thermodynamics. The emergence of the second law of thermodynamics, on the other hand, has been decisive in emphasizing that the classical definition is not correct and that there have been misinterpretations about the implications of the first law of thermodynamics in the context of energy. Therefore, both the first and second laws were necessary to understand energy (Lehrman, 1973, p. 18). The simultaneous existence of the principles of acquisition and compensation or advantages and disadvantages were also emphasized through the functioning of nature (Lindsay, 1971, p. 385). Thus, it can be argued that the contradictory first and second rules of thermodynamics emphasize a sort of balance for energy.

The notions of change and movement do not disregard the conservation of something, which has been variously conceptualized *"as effort, work, force, power"*. It has been stated that *"(...) the total energy at the end of any process is the same as it was when the process started"* (Lehrman, 1973, p. 16). But the conservation principle was not compatible with the losses and restrictions at the energy conversion processes and decreases of energy resources in societies, as mentioned in the context of the second law of thermodynamics (Ibid, 1973, p. 17). Therefore, a narrow, but correct definition of energy was given *"as the ability to produce heat"* (Ibid, 1973, p. 18), since losses and limitations do not apply to the conversion processes from work to heat (Ibid, 1973, pp. 17-18). For this reason, definitions of energy have been about the phenomena of heat or more precisely, the ability to produce heat (e.g. Lehrman, 1973, p. 18; Lindsay, 1971, p. 393). But Lehrman argues that the correctness of this definition does not imply that it is an elegant, useful and comprehensive definition (Lehrman, 1973, p. 18).

It can be argued that industrial developments have affected the definitions that dominate energy in terms of work, heat or power, with concern to material and capital expansion. Tracing the history of energy has inevitably been linked to the industrial developments, invention of machines, and mechanization of human power (Lindsay, 1971, p. 385). But industrial history of energy needs to be problematized. In this regard, it is important to be aware of the philosophical history and roots of energy. In antiquity, the dimensions of energy have been analyzed through the dynamic interactions between the principles of constancy and change in the nature and human experience (Ibid, 1971, pp. 385-387).

In Aristotle's *Metaphysics*, for instance, both converging and diverging aspects of energy, as potentiality and actuality, have been analyzed in the context of the movement, matter, change, consistency, becoming, pleasure etc. in the universe and nature (Aristotle & Reeve, 2016). In this spirit, a comprehensive investigation concerning the potentiality and actuality has been conducted with the philosophical and universal perspectives. But it is argued that the philosophical

history of energy has been avoided. The transformation of the concept has been intertwined with industrial developments and fossil fuels, rather than philosophical considerations, which emphasize a connection between the planet and human societies.

Ciută argues that the concept of energy itself has a huge potential to affect the conceptualizations and actors of security in IR (Ciută, 2010, p. 124). But prioritizing the explanatory and practical usages of energy; conceptualizing energy as a substitution of oil, reactivating the intertwined connection between geopolitics and security, providing hierarchical categorizations among the notions of economics, sustainability and environment have been main reasons for the de-emphasis on the integrative and deeper conceptualization of energy (Ibid, 2010, p. 127). In this regard, engaging with the philosophical constitution of energy might be important to re-conceptualize the connection between energy and security.

In *Energy Security, Equality and Justice*, it is stated that *"we are not interested in energy itself, but with the abundant benefits it provides"* (Sovacool, Sidortsov and Jones, 2014, p. 23). The socio-linguistic transformation of the energy thus indicates an instrumentalist and exploitative perspective towards nature, which might be read as one of the critical differences between the pre-industrial and industrial times (see also Aktan, 2020, pp. 23-43). Criticizing the instrumental usage of energy does not mean to deny or disregard the contributions of industrial and technological developments. Rather, it means increasing ethical awareness about the impacts of fossil fuels-oriented policies on nature through the philosophical aspects of energy and its implications for planetary security.

THE CONCEPT OF ENERGY SECURITY IN REALIST AND LIBERAL THEORIES AND CONTEMPORARY REACTIONS

A literature review indicates the role of two predominant approaches for the definition and conceptualization of energy security in IR. Constantin argues that the first approach has accentuated a realist conception and emphasized competition to control geographically concentrated resources, mainly oil. The second approach has accentuated a more liberal conception and emphasized the role of restricted state intervention for the effective functioning of energy markets (Constantin, 2005, pp. 3-5). Simply put: energy security policies were dominated by realist and liberal theories and understandings in IR (e.g. Constantin, 2005; Dannreuther, 2003, p. 200; Dannreuther, 2015; Goldthau & Witte, 2009; Kuteleva, 2021, pp. 8-11; Luft & Korin, 2009b; Raphael & Stokes, 2016, pp. 346-347; von Hippel et al., 2011, pp. 6719-6722).

National energy security has mainly been emphasized for the consuming/importing states, who lack of abundant energy resources (von Hippel et al., 2011, p. 6721). For this reason, fears to ensure a secure and reliable supply of energy have increased pressures and resulted in the geopolitical emphasis on energy security (Goldthau & Witte, 2009, pp. 373-374). Anxiety and fear to ensure

adequate and sufficient energy resources to meet the needs and demands and to contribute to the national economic growth (Yergin, 2006, pp. 69-70) have been emphasized in the context of the realist, state-centric and interventionist perspectives.

Controlling the conditions that affect energy production, exportation, transportation and consumption processes to ensure consumer satisfaction and continuity of the industrial activities have been addressed as the key concerns of states (Raphael & Stokes, 2016, p. 345). A state-centric perspective and relations among nations, particularly for the developed and industrialized actors (Luft & Korin, 2009a; von Hippel et al., 2011, p. 6721; Yergin, 2006, pp. 69, 75) have been emphasized. Energy security has been evaluated as a crucial component for national security and as an extension of military considerations (Langlois-Bertrand, 2010, p. 10).

Control over critical raw materials and resources has been considered as *"a traditional justification for territorial expansion and imperialism, as well as for the extension of informal influence"* (Keohane, 1984, p. 32). The Carter Doctrine, for instance, exemplifies the connection between oil resources in the Persian Gulf region and the national security of the USA (The Jimmy Carter Presidential Library & Museum, n.d.). For the USA, increasing dependence of the West on the supplies of oil from the Middle East region was one of the critical challenges in the 1980s. The efforts of the Soviet Union to dominate Afghanistan, which contains plenty of exportable oil resources, were evaluated as a threat to the energy security of the West and the USA. The consolidation of the Soviet Union power in the Afghanistan through the located military forces close to the Straits of Hormuz and Indian Ocean was seen as a source of insecurity for the movement of oil from the Middle East. Therefore, military power, naval expansion in the Indian Ocean and deployment of the naval and air facilities in the northeast Africa and Persian Gulf regions have been emphasized (The Jimmy Carter Presidential Library & Museum, n.d.).

The debate between realists and idealists have also affected the dichotomous perspectives in the study of energy security. A realist perspective has evaluated energy security as a subset of power politics of states. The need for a state-centric perspective has been accentuated as a sort of conflict resolution mechanism on the strategic use of energy. Idealists have addressed the role of markets and the interdependency of states in the context of energy security. The assumption is that players in the energy market are rational units and are aware of the fact that a disruption in the energy supply may produce adverse impacts for all of them. Thus, the idealist perspective, as a reaction to the nationalization and strategic use of energy resources, has advocated the role of market integration (Luft & Korin, 2009b, pp. 340-342).

Balance of power and alliances have also been critical for energy security. Morgenthau, for instance, evaluates balance of power as a *"better kind of*

international relations" to ensure stability and preservation (Morgenthau, 1948, p. 125). The balancing of opposing forces has been evaluated as critical to stabilize the un-proportional power relations; to impede the objectives of imperial policies; to provide check and control mechanism between the stronger and weaker states, and to produce favorable outcomes for the weaker states (Ibid, 1948, pp. 129-130). The unstable and dynamic characteristics of balance (Ibid, 1948, p. 131) have been exercised *"either by diminishing the weight of the heavier scale or by increasing the weight of the lighter one"* (Ibid, 1948, p. 134). Alliances or counter-alliances have been evaluated as important components of the balance of power concerning the preservation of the independence and pursuit of goals (Ibid, 1948, pp. 137-139).

Internal and external balancing efforts have thus been critical. Waltz evaluates economic and military strength-oriented strategies as internal balancing efforts. Strengthening and enlarging alliances and weakening the opposite alliances, on the other hand, have been described as external balancing efforts (Waltz, 1979: 118). In this regard, the formations of the Organization of the Petroleum Exporting Countries (OPEC) and International Energy Agency (IEA) (see Keohane, 1984 pp. 60, 192), may be evaluated as an illustration of the external balancing in IR.

From a neorealist perspective, the alliances among states, who share similar characteristics in terms of the availability, distribution and trade of energy resources, may be explained through the imposed rationality by the international system. Waltz argues that the structure of the international system, that is inclined to ensure the balance of power, affects the behaviors of units (agents, states, institutions) through the processes of socialization and competition. Socialization, as the process of absorption and enforcement of 'statehood', demonstrates the role of mutual interactions, encouragements, and restrictions on the behaviors of states. Socialization is thus capable of restricting, shaping and encouraging the policies of states. Waltz argues that socialization and competition may guide the actors to adjust themselves to the regulatory principle of rationality in IR (Waltz, 1979, pp. 74-77; 106-107).

In this spirit, a neorealist interpretation may be given as follows: Socialization as both restricting and encouraging process, competition and structurally imposed rationality may lead to the formation of alliances among the actors, who share similar strengths and weaknesses and suffer from the similar conditions, as exemplified by the formations of OPEC and IEA.

The liberal understanding of energy security, on the other hand, has problematized the state-centric perspective and addressed the role of international energy markets to balance demand and supply and to provide predictability and stability (Goldthau & Witte, 2009, pp. 374-375). Integration and stability in the energy market; communication between governments and companies; high level of transparency and quality in the flow of information have been evaluated as critical

to challenge the energy insecurities and to differentiate the reality from the manipulations, rumors, conspiracies and fears (Yergin, 2006, p. 76). International energy markets have been emphasized as a necessity to mediate the relationship among the market participants; to correct the failures and disruptions in markets; to lower costs, and to set rules and enforcements (Goldthau & Witte, 2009, pp. 378-380).

From a liberal point of view, innovative commercial approaches have been emphasized to undermine the impacts of resource constraints and to mitigate the increasing energy demand in Asia (Yergin, Eklof & Edwards, 1998, p. 36). The disagreements and pressures cannot be resolved through the offensive policies, massive armies and naval expansion, as exemplified in the contested South China Sea, but rather through the markets and cross-border investments which may contribute to the market integration (Ibid, 1998, p. 36). Diplomatic efforts and governmental interventions have also been evaluated as critical to resolve anxieties and disputes concerning sovereignty rights on a particular land or seabed (Ibid, 1998, p. 37).

In this spirit, energy security should not be considered as *"a preparation for conflict, but rather for competition, an approach that comes with achieving security of trade and financial flows across borders by competitive liberalization"* (Yergin, Eklof & Edwards, 1998, pp. 37-38). Secession in the energy market has been evaluated as a threatening factor for energy security and stability. Market integration and globalization of the energy security system have been emphasized to stabilize and to secure the trade of energy resources (Yergin, 2006, p. 76).

Mainstream approaches remain fundamental for the energy security-related issues, which have been securitized and economized in IR and have been intertwined with the history of human civilization. In this understanding, states, who wish to control energy resources for the welfare and domination, seek to obtain adequate and affordable energy resources. But the energy patterns contain environmental, economic, humane, social, democratic and developmental costs and potentials for conflicts. Therefore, the mainstream reading of energy security needs to be challenged with the emergence of the alternative paradigms, in which more holistic and interdisciplinary approach may be developed with the critique of the production patterns and economic growth. The Earth and human beings are not secured in the current, existing energy paradigm. For this reason, it is argued that the impacts of energy security on the environmental well-being and social development need to be taken into consideration (Proedrou, 2015, pp. 1-8).

In this regard, RES, environmental management and efficiency have been incorporated into the classical parameters of energy security, such as availability and affordability (e.g. Goldthau & Witte, 2009, pp. 388-389; Proedrou, 2015, p. 7; Sovacool & Brown, 2010, p. 81; Sovacool & Mukherjee, 2011, pp. 5344, 5353; von Hippel et al., 2011, pp. 6719-6720; Yergin, 2006, pp. 79, 82). It is argued that energy industry and energy security are being transformed by the sustainable

development paradigm (Langlois-Bertrand, 2010, p. 4). The term sustainable energy contains social, economic and environmental dimensions to support human development; to contribute to well-being of future generations, and to provide compatibility with the ecological balance (UNDP et al., 2000, p. 3). In this regard, the tension between economic growth and sustainable development has been incorparated into the dichotomous structure of energy security.

The need to protect the global environment has been one of the most critical challenges for *"traditional (supply-security-oriented) energy policy thinking"*. It is argued that the need for a new paradigm in energy security might converge the energy policies in both resource-poor and resource-rich countries (von Hippel et al., 2011, p. 6722). In this regard, energy security has been evaluated as the *"available, affordable, reliable, efficient, environmentally benign, properly governed and socially acceptable energy services"* (Sovacool & Mukherjee, 2011, p. 5344). Sustainable energy systems have been emphasized to support the balance between the well-being of human beings and the global environment. In this regard, tolerable damage and social awareness to demand healthy environment have been addressed as win-win strategies (UNDP et al., 2000, p. 11), which may be conceptualized as the contemporary energy security paradigm.

THE TRADITIONAL AND CONTEMPORARY PARAMETERS OF ENERGY SECURITY

The traditional and contemporary parameters of energy security may be extracted and explained as follow:

Availability:

It implies having adequate supplies of energy resources, appropriate infrastructure, and proper transformation of the energy resources into services. The security of supply and production, diversification and improvement of self-sufficiency have been addressed as the underlying components for the parameter of availability. Discovering new energy reserves and deposits, technological developments and innovations to contribute to the alternative energy resources and extraction processes have also been critical for the availability (Ciută, 2010, p. 128; Sovacool & Mukherjee, 2011, pp. 5343-5346). Minimization of energy dependency and diversification have been connected with the availability (Sovacool & Brown, 2010, p. 81). Availability has also been evaluated as a component of physical energy security (APEC, 2007, p. 6). In this regard, the reliability and sufficient quantity of both indigenous and external resources have been important (Deese, 1979-1980, p. 140).

Accessibility:

It implies to undermine the barriers in attaining energy resources. These barriers may be explained as geopolitical, technological, financial, infrastructural and maritime insecurities such as piracy, terrorist attacks and accidents. Environmental considerations have also been evaluated as restrictions on the accessibility of the fossil fuel-based energy resources. For this reason, awareness and commitment, technological developments, financial investments, improvement of the transportation and infrastructure, and policy support have been evaluated important to contribute to the parameter of accessibility and dissemination of RES (APEC, 2007). Problems about energy accessibility and rising costs may aggravate conflict behavior within and among states (Deese, 1979-1980, p. 146). Thus, the critical role of the infrastructural investments has been emphasized to contribute to the rapid-response capabilities and to protect energy supply chains, power plants, pipelines and chokepoints (Yergin, 2006, pp. 78-79).

Affordability:

It implies the production and accessibility of energy services at the lowest and stable prices. Accessibility, equity, low and predictable prices have been emphasized as the essential components for the parameter of affordability. From the supply-centric perspective, security of energy demand has been evaluated as important due to the high share of energy exports on government revenues (Sovacool & Mukherjee, 2011, pp. 5343, 5345-5348; Yergin, 2006, p. 71). From the demand-centric perspective, affordable prices have been evaluated as important to undermine any threats related to energy disruptions and constraints which may jeopardize social and economic activities (Deese, 1979-1980, p. 140).

Diversification:

Diversifying the supplies, forms and trade routes of energy has been important to reduce the adverse impacts of energy disruptions. Diversification has been evaluated as a common interest for both producers, and consumers (UNDP et al., 2000, p. 11; Yergin, 2006, p. 76). Diversification has been critical in terms of the energy routes and energy resources. The dissemination of RES has also been evaluated as critical to contribute to diversification strategies (Luft & Korin, 2009b, p. 337). The efforts of China to strengthen its political and economic influence on the energy-producing countries (Rojey, 2009, p. 9) and to concentrate on the African and Middle Eastern oil may be evaluated as a diversification strategy (Luft & Korin, 2009a, pp. 6-7).

Efficiency:

Efficiency implies providing *"the most economically efficient use of energy to perform a certain task (such as light, torque, or heat) by minimizing the units of resources per unit of output"* (Sovacool & Brown, 2010, p. 84). Improving efficiency and conservation may reduce energy consumption and energy imports.

Energy efficiency may be enhanced with the cooperation between governments and manufacturers and social awareness (APEC, 2007, p. 93). Technological developments and energy efficiency have been evaluated as critical in restricting the growth in energy demand (UNDP et al., 2000, p. 5). It can be interpreted that the parameter of efficiency has been emphasized in the context of technological development, management of energy demand and environmental security.

In *Our Common Future: The World Commission on Environment and Development*, the efficient use of resources has been recommended to reduce the adverse impacts of the environmental insecurities on the economic welfare, human development and survival. From the perspective of the parameter of efficiency, economic growth must be less energy-intensive. Redesigning services to provide the same amounts of performance while using less primary energy inputs has been emphasized in the context of the efficiency and sustainable development. The need to change the energy patterns and to disseminate the rapid development of RES have thus been evaluated as critical to achieve environmentally sound and economically viable energy policies for the further development of human beings both in the present and in the future (The World Commission on Environment and Development, 1987, pp. 13-15).

Resilience:

Resilience has been explained as a buffer to reduce the adverse impacts of energy shocks and to facilitate recovery after energy disruptions. Ensuring sufficient spare production capacity and backup supplies, stockpiling critical parts, and preparing comprehensive plans have been evaluated as the essential components for the parameter of resilience (Yergin, 2006, p. 76). The parameter of resilience might be exemplified as follows:

In European Commission's press release, titled as "Towards Energy Union: The Commission Presents Sustainable Energy Security Package", strengthening the resilience capacity for the impacts of the gas supply disruptions was emphasized for the European Union (EU). Increasing energy production in the EU; integration in the energy markets; collaboration among the Member States; deeper inclusion of both RES and natural gas; diversification of the sources, suppliers and routes have been recommended for the resilience. Elimination of the fragility of the EU for the impacts of energy supply disruptions and climate crisis has also been emphasized through the parameters of resilience and diversification (European Commission, 2016).

At the Warsaw Summit of the North Atlantic Treaty Organization (NATO), for instance, the need to strengthen resilience against maritime insecurities and energy supply-related threats has been emphasized. Political and security implications of energy require to provide energy efficiency; to reduce the fossil fuel dependency, and to ensure *"a stable and reliable energy supply, the diversification of import routes, suppliers and energy resources, and the*

interconnectivity of energy networks". The formation of alliances; industrial and technological cooperation ,and share of intelligence with the other international organizations -including the IEA and EU, may be important to contribute to efficient energy security (NATO, 2016). It can be argued that the parameter of resilience as responsibility, awareness and preparedness for the changes or disruptions has supply, demand, security, environment, transportation and communication aspects at multiple levels and therefore, requires further collaboration.

Environmental Acceptability:

Energy production and consumption patterns produce threats not only for the continuity of the economic activities, but also for the well-being of the planet and all habitable systems (Rojey, 2009, p. 11). The use of fossil fuels produces environmental insecurities. Therefore, the need to pursue sustainable energy security has been addressed. This parameter produces restrictions on fossil fuel-based energy policies (APEC, 2007). The compatibility of economic development with the security and survival of the planet is essential in the context of sustainable development (Rojey, 2009, p. 38). The applicability of energy security policies depends upon concerns about the climate crisis. But still, environmental impacts of energy security policies have been neglected (Luft & Korin, 2009b, p. 345).

It can be argued that the parameter of environmental acceptability has been connected with the environmental and human security components of energy security. In *Security: A New Framework for Analysis*, the environment itself, human beings and achieved level of civilization have been evaluated as the referent objects for the environmental security studies. In this study, the functional objects of environmental security have been given as economic actors, governments, governmental agencies, and intergovernmental organizations. It is thus explained that the activities of the economic actors -including firms, corporations, industries- affect the health of the environment. Buzan, Wæver and de Wilde argue that these actors are motivated by profit maximizing. They establish *"acceptable types and limits of exploitation"* for the habitat. The governments, governmental agencies and intergovernmental organizations -which are also the major exploiters of the environment and share roles and responsibilities with the economic actors- establish rules and institutions for the economic actors to function (Buzan, Wæver, and de Wilde, 1998, pp. 71-79). Thus, it can be argued that the referent and functional objects of the environmental security and sector emphasize instrumental relationships between human beings and nature, which needs to be problematized.

Human Security and Sustainability:

Apart from the implications on national security, energy security has also been a critical component for human security (Sovacool & Brown, 2010, p. 79). Energy has been evaluated as an indispensable element for the continuity of human life. Adequate and affordable energy is essential for human welfare and economic

development. But the production and consumption of energy resources should not jeopardize the environment and quality of human lives (UNDP et al., 2000, p. 31). Ensuring the well-being of human beings, without compromising the well-being of future generations has been emphasized in the context of sustainability. It is explained that there should be restrictions upon the utilization of the technology and resources due to the carrying and absorbing capacity of the nature and global environment (The World Commission on Environment and Development, 1987, p. 8).

The introduction of Sustainable Development Goals (SDGs) has been important for both human and environmental security. Promotion of affordable and clean energy; water security; economic growth; safe and resilient human settlements etc. have been emphasized with the SDGs (UNDP, n.d.). But the idea is that SDGs demonstrate a human-centric perspective. It is important to be aware of the limitations of the state-centric and human-centric frameworks concerning the relationship between energy security and climate crisis. The limitations of state-centric and human-centric frameworks do not imply disregarding them in IR. Rather, a critical awareness may encourage to develop a deeper understanding and re-evaluation about the definition, role and responsibilities of these entities and the intrinsic value of nature with the inclusion of the philosophical aspects of energy (Aktan, 2020, pp. 125-126).

Environmental degradation and socio-economic problems are connected with problematic aspects of global energy security. The increasing impacts of the environmental challenges require a transformation for energy security (Goldthau & Witte, 2009, p. 283). In the United Nations Development Programme (UNDP)'s Session Notes, titled as "Human Development in the Anthropocene: Transformations to Expand Human Freedoms in Balance with the Planet", it is explained that development as the process to expand the freedoms and capabilities of human beings needs to be redefined in the context of the Anthropocene. It is argued that the tendency to evaluate nature and the planet as the restriction on the activities of human beings needs to be problematized with the interdependence between human societies and ecosystems. Thus, there is an urgent need for a paradigm shift and deeper understanding concerning the relationship between human beings and nature (UNDP, 2020).

The institutional recognition concerning the need to transcend beyond instrumental considerations of the value of nature is important. The tendency to conceptualize the concept of environmental security through the continuity of the economic activities and well-being of human beings is problematic and requires a critique about the concept of sustainable development. The contemporary energy security paradigm with the emphasis on environmental and human security may thus not be compatible with planetary security in the long term. Because human beings and economic development-oriented arguments may produce instrumental and exploitative policies in the context of energy security. In this regard, focusing

on China, as a reference case, may reveal the problematic aspects of both traditional and contemporary energy security paradigms. The observable disproportion and planetary insecurities in China's energy security policies may display problematic and unreliable characteristics of the contemporary energy security paradigm.

THE ENERGY SECURITY OF CHINA

Yergin explains that *"as late as 1993, China was self-sufficient in oil"* (Yergin, 2006, p. 71). But economic growth and increasing demand for oil have changed the energy policies of China and energy balance of Asia. There has been a major shift from the principle of self-sufficiency due to energy dependency (Ibid, 2006, pp. 71-72; Yergin, Eklof & Edwards, 1998, p. 35), which, according to Yergin, implies the need for integration with the global energy markets and protection of the energy supply chain. Integration with the world economy has been evaluated as critical for China to ensure the continuity of the economic activities for the huge population and to undermine energy disruptions (Yergin, 2006, pp. 76-77). Tha parameters of affordability, reliability and accessibility have also been evaluated as critical for the energy security of China (Howell, 2009, p. 191). In this regard, integration, affordability, reliability and accessibility have been critical against the increasing dependency on energy imports (see Table 1).

Table 1: Net Energy Imports – People's Republic of China.

Years	Net Imports	Units
1990	-1466.8579	TJ
1995	-548.4666	TJ
2000	1166.8612	TJ
2005	4193.4989	TJ
2010	14451.9962	TJ
2015	20990.1031	TJ
2019	31550.0501	TJ

Reference: IEA (n.d.-a). "Net Energy Imports". *IEA Data Services.* https://www.iea.org/countries/china (18.04.2022).

Starting from 1978, alterations in the economic growth and foreign trade have affected the degree of the principle of self-reliance in China. Opening up policy; diversified foreign trade and investments have strengthened its global integration. The entry into the World Trade Organization also affected international competitiveness of China. But increased economic growth, domestic consumption

and high energy inputs produced environmental threats and costs. Therefore, balancing foreign trade competitiveness; conservation and efficiency of resources, and environmental protection has been evaluated as critical for China in readjusting its economic and industrial structure (The State Council of the People's Republic of China, 2011).

It is explained that the production and use of energy resources, particularly coal, have been critical for the economic growth in China. Industrialization process has thus been accompanied by the increase in coal consumption and coal reliance (IEA, 2021, pp. 21-22). As it can be seen in Table 1, there is an increasing dependency on energy imports for China. The alterations in the energy security of China have been subject to realist and/or liberal-oriented explanations (e.g. Goldthau, 2010, pp. 28-30; Gong, 2002; Yergin, Eklof & Edwards, 1998, pp. 36-38). But there have also been alternative explanations, including constructive (Constantin, 2005; Kuteleva, 2021) and securitization of energy-oriented approaches (Phillips, 2013). From a realist point of view, possible confrontations and struggles over resources have been emphasized. The South China Sea, for instance, has been evaluated as one of the critical areas for realist-driven security concerns (Yergin, Eklof and Edwards, 1998, pp. 36-37).

The South China Sea disputes have been rooted in the controversial issues about sovereignty, territorial control, ownership rights to energy resources, transport of energy resources through the sea lanes, security of energy supply and competition with the USA for the East Asian maritime security domination. Different estimations and interpretations concerning the volume of energy resources in the South China Sea could not obstruct Chinese authorities to adopt aggressive policies. In this spirit, it is argued that China does not pursue a collaborative and multilateral approach for energy and maritime security-related concerns, especially in the South China Sea (Herberg, 2016).

From a liberal point of view, on the other hand, realist-driven considerations about the energy security of China have been evaluated as an exaggeration and oversimplification, compared to more controversial foreign policy issues. Therefore, it is argued that increasing energy needs of China may contribute to interdependence, cooperation and market integration, rather than conflicts and confrontations (e.g. Dannreuther, 2003; Yergin, 2006, p. 77). It is also argued that market mechanisms might be effective to coordinate and compansete renewable energy industry and traditional energy industry in China (Xu, 2020, p. 6). In either case, Goldthau & Witte argue that global energy system needs to be reformulated and China, as one of the energy-intensive consumers, has a critical impact upon this process (Goldthau & Witte, 2009, p. 374).

Since the mid-1990s, energy policies of China have been described as mainly strategic. Dannreuther explains that energy dependency has actually increased the role of market-based approaches in the energy policies of China (Dannreuther, 2003, p. 201). Goldthau & Witte also argue that stronger cooperation

is imperative for China due to lack of comprehensive equipments against the energy disruptions (Goldthau & Witte, 2009, p. 386). In this regard, ensuring integration and cooperation in the energy markets might be seen as resilience strategies for China.

Apart from the emphasis on market strategies, technological developments might also be seen as one of the prominent resilience strategies of China. It is explained that economic growth has resulted in the growth of energy consumption in China (Du & Lin, 2015, p. 570). In this context, technological development has been one of the prominent applied mechanisms to check the growth of energy consumption and to contribute to energy efficiency in China (Ibid, 2015, pp. 574-575). It is concluded that technological progress plays an important role for energy efficiency and energy conservation. But still, adjustment of the industries and economic structure is also necessary to check energy consumption growth in China (Ibid, 2015, p. 576).

From the perspective of IR theories, Constantin argues that the explanatory power of realist and/or liberal perceptions has been used in analyzing China's energy security. Realist and liberal perceptions have thus underpinned the ascribed meanings of the energy security of China. But both of these perceptions fail to provide a projection and benchmark for the long-term assessments. A third alternative approach has been proposed through the energy conservation plan of China. This kind of a constructive perspective has been recommended to distinguish the energy security characteristics of China from the experiences of the other developing states; to incorporate the environmental aspects, and to provide both material and ideational frameworks (Constantin, 2005).

Energy conservation plan has been emphasized as a necessary mechanism to alleviate energy constraints, environmental issues and to contribute to growth and competitiveness in China. It is explained that the total primary energy consumption in China grew 53% in 2002, compared to 1990. Coal and petroleum have been calculated as the primary energy consumption resources in China. For this reason, the needs to transform the patterns of economic growth; to incorporate sustainable development strategies into the macroeconomic policies, and legal regulations have been addressed. Both governmental and market-driven approaches have been recommended for the energy conservation plan. Governmental regulations have been evaluated as critical to reduce market failures. Thus, creating energy-conserving society through (i) the technological developments, (ii) governmental initiatives and (iii) market-driven formulations have been emphasized (National Development and Reform Commission, 2004).

China adopted Renewable Energy Law to ensure energy safety; to expand markets for renewable energy and to protect the environment, dated as 2005 (The National People's Congress of the People's Republic of China, 2005). Energy conservation plan was also legislated in China. In this law, energy conservation has been defined as *"tightened control over the use of energy"* and utilization of the

technologically feasible, economically rational, environmentally and socially acceptable resources. Energy efficiency; reduction of pollution; prevention of the energy waste have also been emphasized to maintain economic and social improvement. Governmental mechanisms and industrial policies have been addressed to facilitate energy conservation plan and environmental protection. Public dissemination of knowledge has also been emphasized. Therefore, the integration of the energy and environmental security-related insights into the national education curriculum has been advocated to enhance awareness about energy conservation (The National People's Congress of the People's Republic of China, 2007).

It can be argued that the efforts to increase public knowledge and awareness about the impacts of energy consumption reflect the need to affect the choices of individuals in an effective and regulative manner. The public awareness is critical, especially in rapidly growing populations, such as China, with the expectation to have a 1464,3 million population as of 2030 (UN Department of Economic and Social Affairs, n.d.). But still, major planetary threats stem from the continuity of fossil fuel-based energy policies in China. Despite the growth in renewables and market for solar, wind and electric vehicles, China continues to be heavily dependent on fossil fuels. It is explained that China is the largest coal-consumer and largest emitter of greenhouse gases in the world (IEA, 2021, p. 18; see also IEA, 2020a).

There is a high share of coal in the total energy supply and total final consumption by source in China (Table 2 and Table 3). In 2020, more than half of global coal was consumed in China (IEA, 2020a, p. 5; IEA, 2020b, p .70). China also accounts for over 50% of global coal demand (IEA, 2020b, p. 195). High level of coal consumption has actually resulted in high level of coal import. China is thus world's largest coal importer due to high level of domestic use and consumption of coal. As a coal-reliant country, there have also been ongoing governmental efforts and initiatives to contribute to the coal sector and coal conversion projects in contrast to commitments about climate security and carbon neutrality (IEA, 2020a).

Table 2: Total Energy Supply (TES) by Source – People's Republic of China.

Sources / Years	Coal	Natural Gas	Hydro	Wind, Solar, etc.	Biofuels and Waste	Oil	Nuclear	Units
1990	22211650	536080	456192	1388	8392235	4973396	-	TJ
1995	27131803	627918	686077	54157	8573537	6534880	139996	TJ
2000	27830501	869018	800690	110795	8297058	9244890	182585	TJ
2005	50396233	1624042	1429261	221166	7050162	13306545	579142	TJ

2010	74961354	3742244	2560979	665155	5580696	17917681	805964	TJ
2015	83702969	6639779	4012092	2056636	4758080	22555622	1863153	TJ
2019	86732649	10390620	4581137	4028267	5299140	27131707	3800236	TJ

Reference: IEA (n.d.-b). "Total energy supply (TES) by source, People's Republic of China 1990-2019". *IEA World Energy Balances.* https://www.iea.org/countries/china (18.04.2022).

Table 3: Total Final Consumption (TFC) by Source – People's Republic of China.

Sources / Years	**Coal**	**Crude Oil**	**Oil Products**	**Natural Gas**	**Wind, Solar, etc.**	**Biofuels and Waste**	**Electricity**	**Heat**	**Units**
1990	13037897	110573	3431397	371403	1349	8392235	1634018	553267	TJ
1995	15020133	56522	5227669	379848	49917	8524942	2759843	816362	TJ
2000	11491308	94580	7457112	518217	104553	8241825	3731695	1067660	TJ
2005	22539107	151437	11306086	1218303	209398	6955233	7180592	1816685	TJ
2010	29803787	135610	15314894	3068981	497452	5046130	12422686	2583902	TJ
2015	31805390	143314	20153967	4406313	1240834	3779921	17535712	3487380	TJ
2019	24040577	24317	22688956	7492767	1743660	3499781	23482138	4660966	TJ

Reference: IEA (n.d.-c). "Total final consumption (TFC) by source, People's Republic of China 1990-2019". *IEA World Energy Balances.* https://www.iea.org/countries/china (18.04.2022).

Xu argues that China's dependency on fossil fuels and introduction of hybrid energy policies through the technological developments and RES might be read as a paradox in the context of energy security and energy transition process (Xu, 2020). Xu evaluates coal as a stabilizing resource on the energy supply security of China and emphasizes that it is a challenge to replace coal in a short time (Ibid, 2020, p. 5). It is explained that China, as the world's largest coal producer, mainly uses coal for electricity and heat sector (IEA, 2021, p. 23).

Electricity generation has been one of the primary areas for the use of coal. According to collected and compiled data from International Energy Agency (IEA), coal has been primary energy resource for the electricity generation in China between 1990-2019 (IEA, n.d.-d). According to the Stated Policies Scenario

of the IEA, China will experience the largest absolute increase in electricity demand in 2019-2025 (IEA, 2020b, p. 219).

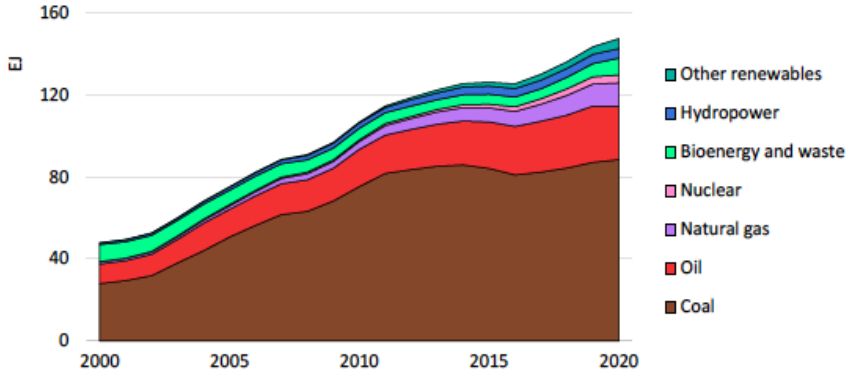
According to the Stated Policies Scenario of the IEA, it is expected that China is leading the path for the use of RES in electricity generation by 2030 (IEA, 2020b, p. 214). Global pandemic conditions also confirmed the importance of RES in the context of resilience (Ibid, 2020b, p. 227). In this regard, electricity security and RES play a critical role for the energy security of China. Diversification of energy resources, especially in electricity generation, is also critical in the context of the climate crisis.

It is explained that the policies to preserve the role of coal (IEA, 2020b, p. 198) and concerns about oil and gas dependency might affect energy transition process adversely in China. Concerns about emissions and air quality, on the other hand, might also speed this process (Ibid, 2020b, p. 199). It is also explained that the efforts of China in recovering from the impacts of the global pandemic conditions have produced adverse impacts in terms of fossil fuel consumption, coal burning and air pollution, resulting from the activities of power plants, industry and transport. The climatic outcomes of the recovery efforts of China have actually been evaluated as a rebound and reversal of the previous efforts to decrease air pollution (CREA, 2020).

Oil and natural gas are also important for the energy security of China. It is explained that China is the second largest oil consumer in the world (IEA, 2021, p. 13). While the demand for oil and natural gas has grown, the reliance on oil and natural gas imports has also increased (Ibid, 2021, p. 24). In this context, China's crude oil import has grown from 122 380.0 EJ in 1990 to 22 690 613.0 EJ in 2020. China's natural gas import has also grown from 36 984.0 TJ-gross in 2006 to 5 062 633.0 TJ-gross in 2020 (IEA, n.d.-e). It is explained that despite the efforts for domestic oil and gas production, oil and gas dependency of China is still high. *"China imported around 513 million tons in 2021 with its oil dependency reaching around 72.7 percent"* (Xin, 2022).

In 2021, China was world's fifth largest oil producer by surpassing Iraq, United Arab Emirates, Brazil, Iran and Kuwait. The top oil producers have been USA, Saudi Arabia, Russia and Canada (EIA, 2022a). In 2019, USA, China and India were the largest consumers of oil (Ibid, 2022a). As it can be seen in the Table 2 and Table 3 the high dependency on coal jeopardizes the energy security of China and leads to prioritization of supply security-centric policies, in which, oil and natural gas have a critical role. Total primary energy demand for coal, oil and natural gas (Figure 1) also requires to adopt supply-centric policies.

Figure 1: Total Primary Energy Demand by Fuel in China.



Reference: IEA (2021). "An Energy Sector Roadmap to Carbon Neutrality in China". *International Energy Agency (IEA)*, p. 23. *https://iea.blob.core.windows.net/assets/9448bd6e-670e-4cfd-953c-32e822a80f77/AnenergysectorroadmaptocarbonneutralityinChina.pdf* (18.02.2022).

In a speech by President Xi Jinping, a realistic approach to energy security is shared with an emphasis on the availability of coal in China. While the responsibility towards ecological security is acknowledged, it is explained that a quick departure from coal would not be realistic given the energy conditions in China. President Jinping explained how being *"rich in coal and poor in oil and gas resources"* obstructs quick results in terms of green development and carbon reductions as follows: (The State Council of the People's Republic of China, 2022).

> *"In light of our country's energy situation rich in coal and poor in oil and gas resources, we should act on the national plans and arrangements for carbon emissions peaking and carbon neutrality, apply systems thinking, stay committed to the principle of pursuing progress while ensuring stability step by step, and coordinate efforts to reduce carbon emissions, address pollution, promote green development, and maintain continued growth. When carrying out carbon reductions, we must also ensure the security of energy, food, and industrial and supply chains, as well as the normal life and work of our people. We must not distance ourselves from realities and rush for quick results"* (The State Council of the People's Republic of China, 2022).

In this regard, it is argued that Belt and Road Initiative (BRI) was also formulated to contribute to energy security. In *China's Asian Dream: Empire Building along the New Silk Road,* it is explained that one of the goals of China is to diversify energy supplies through BRI (Miller, 2019, p. 31). BRI thus demonstrates China's energy security goals and concerns as well.

The combination of the Silk Road Economic Belt and Maritime Silk Road has been introduced with the emphasis on market-driven approaches; environmental protection and has been conceptualized as a *"win-win cooperation"* by the Chinese authorities. Economic integration, cooperation and investments have been emphasized with the promotion of ecological progress and protection of biodiversity (National Development and Reform Commission, 2015). Up to the present, 143 countries have been involved in the BRI (Belt and Road Portal, n.d.).

Saudi Arabia, Russia, Iraq, United Arab Emirates, Iran and Kuwait have been involved in the BRI and have also been listed in the 10 largest oil-producing countries (alongside China) in 2021. The USA, Canada and Brazil, have also been listed in the top 10 largest oil producing countries in 2021, are not involved in the BRI (Belt and Road Portal, n.d.; EIA, 2022a). Russia, Iran, Qatar, Saudi Arabia, Kazakhstan, Turkmenistan, Nigeria, Algeria, Iraq, Indonesia, Venezuela and Mozambique, which have the largest or noteworthy share of the natural gas reserves in 2020 (EIA, n.d.), are also part of the BRI (Belt and Road Portal, n.d.).

The USA and Australia, also have a noteworthy share of the natural gas reserves in 2020 (EIA, n.d.), but are not part of the BRI (Belt and Road Portal, n.d.). In this context, China's oil and gas imports by country (see EIA, 2018; EIA, 2022b; Howell, 2009, pp. 194-196) are also connected with the geographical coverage of BRI. Thus, it can be argued that the geographical dissemination of BRI has also been connected with the efforts to diversify the form, supply, route, relations and alliances of energy for China.

There have been criticisms about BRI in terms of the geo-strategic aspirations of China; financial pressures on the governments that have accepted the Chinese loans, resulting from BRI (e.g. Chellaney, 2017) and environmental insecurities (e.g. Ascensão et al., 2018). Chellaney explains that the infrastructural projects of BRI have been carried out with the introduction of the loans and debts, which have intensified the asymmetric relationship between China and geo-strategically important developing states. A *"debt trap"* has been addressed for the developing states who have been subject to permeated Chinese initiatives, projects and loans in the context of BRI. The role of infrastructural projects in facilitating the accessibility of the natural resources for China and in providing low-cost market for the Chinese goods has also been evaluated as a threat and restriction for the developing economies. Thus, BRI has been emphasized as *"commercial penetration and strategic leverage"* of China (Chellaney, 2017).

But the advocates of BRI argue that the critiques about the leading role of the Chinese government projects and about the incompatibility with the free market principles neglect the national conditions of the least-developed and developed states. Thus, it would be unrealistic to expect the effective functioning of high-standard market rules in the context of BRI. It has also been argued that the combination of governmental interventions and market-based approaches may be effective in resolving the failures, resulting from the Western free market model. It is argued that USA, as the non-participant actor of BRI, may be evaluated as a *"BRI-related country and a de facto participant"*, since the extent and inclusion of this initiative have deepened over time. Yiwei has explained that *"the United States risks becoming a lonely superpower!"* (Yiwei, 2019).

The BRI has also been subject to environmental concerns. The trade, infrastructure and transportation projects and investments of BRI pose threats to the environmental security. The prioritization of economic aspirations over the protection of the environment and natural resources has been problematized in the context of BRI. The prioritization of the economic aspirations implies contradiction, concerning the efforts of China in developing and incorporating green technologies, in investing for the dissemination of RES, especially solar power, and in complying with the SDGs (Ascensão et al., 2018, pp. 206-209; Spiegel, 2020). The land and maritime use, infrastructural investments, mineral extraction, energy intensive projects and industrial activities of the BRI may produce adverse impacts on the well-being of the habitat and on the security of water resources. The instrumentalization of BRI*"to perpetuate the use of coal and other fossil fuels"* has also been addressed with regard to climate security (Spiegel, 2020).

In a report, published by the World Wildlife Fund (WWF), the overlap between the BRI corridors and environmentally sensible and valuable areas has also been detected. Therefore, the need to incorporate ecological infrastructure projects and investments into the policy-making and decision processes of BRI has been emphasized (WWF, 2017, p. 4). The environmental impacts of BRI have been evaluated as a challenge for sustainable development (Ibid, 2017, p. 9). For this reason, the need to disseminate renewable energy infrastructure has also been emphasized in the context of BRI (Ibid, 2017, p. 11). The detected fossil fuel-based investments and capital flows, especially in the energy and transportation sectors over the period of 2014-2017 of BRI (Zhou et al., 2018, p. 3) also need to be problematized in the context of planetary security.

It is argued that energy security of China contains both old and new approaches in terms of the diversification strategies; research and development about the strategic reserves, and new domestic resources; commercial policies and resolutions (Yergin, Eklof & Edwards, 1998, p. 36). It is also argued that *"there is a bifurcation in China's energy paradigm"* in terms of the politicization of energy and development at the global/international level and securitization and supply

security of energy at the national level (Kuteleva, 2022, pp. 50-51). In this regard, the concept of planetary security is recommended to transcend the relation and tension between realist and liberal understandings.

PLANETARY BOUNDARIES AND ENERGY SECURITY

Environmental insecurities have damaged the stability and resilience of the planet. Therefore, nine identified planetary boundaries have been identified against the adverse impacts of the environmental change. The planetary boundaries have thus been evaluated as critical in increasing normative judgmental awareness of human societies (Rockström et al., 2009, pp. 472-473).

In "A Safe Operating Space for Humanity", nine planetary boundaries (Rockström et al., 2009, pp. 472-473) have been explained as follow:

> *"Climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorus cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading"* (Rockström et al., 2009, pp. 472-473).

It is explained that three of the planetary boundaries -climate change, accelerated biodiversity loss and interference with the nitrogen cycle- have been transgressed and there has been significant erosion on the resilience of the Earth and ecosystems. Transgressing these boundaries has been evaluated as a threat to the social and economic development of human beings (Rockström et al., 2009, pp. 473-475).

It is explained that Anthropocentric boundaries in IR; instrumentalization of the nature and non-human life produce adverse impacts for both human and non-human life (Youatt, 2014, p. 208). In this regard, Anthropocentric framing of IR has been criticized. It is argued that the reality of the planet has been neglected (Burke et al., 2016, p. 501). In "Planet Politics: A Manifesto from the End of IR", it is argued that *"a new global political project"* is necessary to understand planetary realities and to adjust the categories and methodologies of IR with the challenges and opportunities of the Anthropocene (Ibid, 2016, p. 502).

Compatibility with the planetary boundaries has been evaluated as important to reduce the adverse impacts of Anthropogenic activities. The concept of planetary boundaries has also been revised. In "Planetary Boundaries: Guiding Human Development on a Changing Planet", genetic diversity and biochemical flows of the Earth have been evaluated as in the beyond of the safe operating boundary. Changes in the climate and land have been evaluated as the indicators of uncertainty and increasing risk. It is explained that climate change and biosphere integrity, in which the latter contains functional diversity and genetic diversity, are the core for the model of planetary boundaries.Transgressions of climate change,

biosphere integrity, biogeochemical flows and land system change destabilize the Earth and the development of human societies. Therefore, it is important to be aware of planetary boundaries and to produce valid policies and decisions in line with the planetary stability and security (Steffen et al., 2015, pp. 736)

> *"The climate system is a manifestation of the amount, distribution, and net balance of energy at Earth's surface; the biosphere regulates material and energy flows in the ES and increases its resilience to abrupt and gradual change"* (Steffen et al., 2015, p. 736).

In this regard, the impacts of energy security policies on planetary boundaries should also be assessed. The adherence to the contemporary energy security paradigm needs to be re-analyzed with the inclusion of the critique of Anthropocentric perspective. It is argued that Anthropocentric perspective might allow us to problematize state and capital-centric perspectives and to increase awareness about the incompatibility with the planetary reality and capitalism, in which nature has been considered *"as mere material in wait of profit"* (Burke et al., 2016, p. 504). The term planet politics has thus been proposed to rethink about the interdisciplinary paradigms of IR in the context of the Anthropocene. In this regard, it is argued that there should be a cooperation between the Earth System Science and ethical, moral and ontological perspectives in IR (Ibid, 2016, p. 506) and there should be a rethinking and an imagination beyond the state and human-centric perspectives (Ibid, 2016, p. 507).

But it is also important to explain how planet politics has been subject to criticisms in terms of the intertwined relationship between planet politics and liberal internationalism and cosmopolitan perspectives in IR. Chandler, Cudworth and Hobden argue that planet politics cannot escape from the constraints of ethics in IR and can reproduce the liberal framework and coercive mechanisms of international law. In "Anthropocene, Capitalocene and Liberal Cosmopolitan IR: A Response to Burke et al.'s 'Planet Politics'", the lack of a conceptual clarification for the humanitarian and ecological interventions has also been evaluated as a weakness due to the risk for the authoritarian policies, and hierarchical categorizations through the mechanisms of global governance and international law. The critique of human-centrism has also been evaluated as ambiguous and contested due to the de-emphasis on the source and responsible actors of the climate crisis and risks for the reproduction of elitist imperatives in IR. In this regard, the concept of the Capitalocene has been proposed to emphasize that the notion of the human is not the cause for the ecological crisis, but rather *"a specific subset of the human",* through the capitalistic forms of relations and organizations. It is explained that Capitalocene does not disregard the need for a change in human consciousness. Rather, it prevents us from neglecting the responsibility of capitalistic relations and organizations. But still, it is argued that engaging with the

alternative forms of social organization is necessary, but not sufficient against environmental degradation (Chandler et al., 2018).

In response to these criticisms, it is argued that the term Anthropocene cannot be reduced to the problems, resulting from globalization and capitalism. In "Defending Planet Politics: A Reply to Our Critics", it is explained that the term Capitalocene may also neglect the responsibility and role of human beings as one of the important earthly agencies. It is argued that preventing crimes against the global environment and biodiversity should not imply imperialist intervention, violence and coercion. The Anthropocene does not mean to disregard the destructive and harmful role of capitalist structures in the planetary collapse. Rather, it means to canalize plurality, constructive approaches, cosmo-visions, ethics, social justice and long-term resolutions into climate policies and to increase political responsibility. Climatic, ecological and geophysical insecurities of the Anthropocene, which have been intertwined with colonialism and domination of human beings, require to problematize the existing structures and methodologies of IR. Therefore, a post-human thinking in IR has been emphasized to contribute to the engagement of the Anthropocene or Capitalocene with the mechanisms of politics and international law (Fishel et al., 2018).

It is important to revisit and remedy the contemporary energy security paradigm with the inclusion of the critique of both Anthropocentrism and Capitalocene. The concepts of planet politics (Burke et al., 2016; Fishel et al., 2018) or interspecies relations (Youatt, 2014) have been recommended for a post-human transformation in IR. It is argued that the concept of planet politics may be effective in providing responsive approaches towards the impacts of the Anthropocene and in redefining human worlding (Burke et al., 2016, p. 518). Youatt also explains a critique of the Anthropocentrism is important to reorient *"our relation to animal life, human and nonhuman"* (Youatt, 2014, p. 213). In this regard, it can be argued that existential implications of the post-human thinking in IR are compatible with the philosophical history of the concept of energy.

CONCLUSION

Increasing economic growth, energy demand and environmental concerns have been effective in compelling China to adopt both traditional and contemporary parameters of energy security, albeit the traditional parameters and strategic considerations have been the strongest orientations, which may be exemplified with the dependency on fossil fuels and dissemination of BRI. In this regard, the parameters of availability, accessibility, affordability, diversification and resilience are more dominant compared to the parameter of environmental acceptability.

It can be argued that energy security policies of China and environmental assessments about the BRI reflect the contradictory aspects of the contemporary energy security paradigm. This failure is observable through the continuity of fossil

fuels-based policies in China. Therefore, the concept of planetary security deserves further elaboration for the conceptualization of energy security and critique of fossil fuels-based policies. Planetary security may be effective to map the socio-linguistic transformation of the concept of energy; to increase critical awareness about the state, capital and human-centric perspectives; to transcend dichotomous perspectives in the context of energy security and to encourage normative and interdisciplinary studies.

Focusing on relationship between energy security and human beings in terms of economic growth, human needs and demands is problematic and capable of reproducing adverse impacts on the well-being of the environment in the long term, as exemplified by the continuing fossil fuel-based policies in China. To illustrate this point, we must be sensitive to the emergence of the new approaches and paradigms, in which, planetary security might play a critical role and might encourage interdisciplinary approaches in the field of energy security.

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