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Breaking the era of energy interdependence in Europe: A multidimensional reframing of energy security, sovereignty, and solidarity

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A R T I C L E I N F O

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A B S T R A C T

The era of energy interdependencies between Russia and the European Union (EU) is at an end. This paper advances a nuanced accounting of energy security based on energy sovereignty and energy solidarity. Energy solidarity requires a pooling of energy sovereignty based on values. A historical case study is developed assessing German, Polish, and EU energy relations with Russia. Previous energy security scholarship perceived interdependency as a measurable source of energy security. Since the start of Russia's 2022 war with Ukraine, energy geopolitics has changed, making hard power relevant to Europe's policy toolbox. The EU and Member States responded to Russia's aggression with 'soft' policies encouraging the shift away from Russian gas, such as using renewable energy and coordinating joint gas purchases. They also deployed hard power tools in the form of economic sanctions and a Western price cap on Russian oil. Europe regrouped its energy sovereignty and pooled it into energy solidarity, improving its energy security. Both terms are now integral to the EU's energy market operations and are essential in enhancing energy security and developing a new conceptual lens on energy security.

"Europe will not be made all at once, or according to a single plan. It will be built through concrete achievements which would first create a *de facto* solidarity" – Robert Schuman, 1950 [1].

1. Introduction: framing energy sovereignty and solidarity in the EU

In 1952, the foundation stone of the European Union (EU) was placed in the European Coal and Steel Community (ECSC). In this post-WWII period, the logic held that controlling industry and energy through a supranational organization could prevent conflict between European powers [1]. The concept of economic integration sped up after the oil crises of the 1970s when an age of energy interdependencies developed between Europe, the Soviet Union, and later Russia [2–5]. Since the 1990s, political integration occurred as the European project expanded Eastward, eroding political-economic boundaries. Resulting in new relationships with Russia coming under the umbrella of the EU and fostering new energy relationships in post-communist countries [6–9]. This accelerated a new energy era of greater energy interdependence with Russia [7–10].

Since the 1970s, energy security in general was guided and defined by the concept of three or four A's: Availability, Accessibility, Affordability, and for some authors, Acceptability [11,12]. This assessment emerged because of the failure to foresee the oil crisis of the 1970s and the assertion and impingement of energy sovereignty by Arab members of OPEC on Western countries [13,14]. This led the West to search for a way to dilute the oil cartel's power [14,15]. The answer was the global interdependency of oil markets [15–17]. Likewise, a similar strategy of interdependency was fostered with Russian gas and oil [7,8,18]. In 2021, the unexpected spiking gas prices in Europe and Russia's 2022 invasion of Ukraine left Europe at a loss because its energy security and sovereignty were dramatically undermined [19,20]. The guiding concept of interdependency no longer matched the changed reality as measured in the gas price.

The European reality was Russia shorted gas supplies in 2021 as an explicit weapon to exert leverage against EU Member States [15,19–22]. In response, the EU used access to its energy market to exert pressure on Russia [15] — the limits of the four As reached its limits. What was once seen as *available* and *affordable* with secure *access* was now *unacceptable*. The analysis here does not discount the four As, but seeks to go deeper to understand how Russia positioned itself to turn energy interdependency into energy dependency. The response by the EU relied on the previously contested term, 'energy solidarity' to guide the policy response. Within a matter of weeks, the EU's Russian energy strategy would no longer be

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guided by the soft power of attraction to foster interdependence [3,23]. Instead, economic sanctions - hard power – would be used to stop Russia from profiting from the EU's energy market.

After Russia's 2022 invasion of Ukraine, energy security was quickly reframed from interdependence to independence [2,8,24]. European Commission President Ursula von der Leyen said, "We must become independent from Russian oil, coal and gas. We simply cannot rely on a supplier who explicitly threatens us" [24]. The policy response was launching a more ambitious energy transition plan, the RePowerEU, accelerating the previous Fit for 55 package aimed at a net zero energy system by 2050 [25].

Europe is now entering a new energy era independent of Russian energy resources where security, sovereignty, and solidarity shape a revised geopolitical energy landscape, and a new definition of energy security emerges [11,19,20,26,27]. Goldthau and Youngs call this a 'New Geopolitics of Climate Transition' [21]. This can be contrasted with an 'age of energy interdependencies' when oil became a global commodity and gas became a tool for European-Russian political and economic interdependence, preventing the weaponization of energy [2,15,28].

After 50 years, since the first oil crisis in 1973 to the invasion of Ukraine in 2022, it is essential to assess how weakened energy security became in Europe. In a more focused context, two research questions provide the ability to examine how European energy security was undermined and identify new building blocks of Europe's new energy security. The questions are: how did diverging perspectives on energy security lead to Russia threatening EU energy supplies? And, how do energy sovereignty, and energy solidarity contribute to the EU's energy security? Answering these questions does three things: Empirically, it shows how Russia created internal tension in the EU and fostered a weakened energy security environment. Conceptually, the approach delivers a revised energy security framing highlighting the importance of energy sovereignty and solidarity. And finally, the questions assist in building an assessment to guide future energy policies to reduce external energy security threats to European energy security.

Energy security is the broad umbrella where energy sovereignty and solidarity balance the power relations within Europe's energy system. Energy sovereignty is embedded in the European project, extending from individuals to communities [27,29] and reflected in national governments' "ability to decide independently about the structure and source of its energy supply" [11]. Solidarity likewise holds an inherent position in the EU's founding treaties, including in the Lisbon Treaty where 'energy solidarity' holds a legal obligation meant to provide greater energy security and security of supply to assist other Member States [30–34]. Energy sovereignty represents Member States' authority to act, while energy solidarity signals alignment in the EU energy market.

A multidimensional concept of energy security [35] is embedded in the EU's energy market. This perspective perceives the EU operationalizing energy security through the use of hard and soft power [23]. Hard power is defined as, using carrots and sticks to get what one wants. While soft power is defined as being attractive to create a preferred outcome [3,36–38]. This broad framing contributes to utilizing an International Relations perspective on energy security. Enabling energy security to be defined as a multidimensional concept that is a 'threat multiplier' affecting security of supply *and* areas of social, economic, and geopolitics [35]. Fig. 1 provides a visual reference where the energy system sits below an energy security umbrella but is supported by energy sovereignty and solidarity. An imbalance in one of the 'three Ss' means the energy system itself is unbalanced. Section 2 reviews how the EU energy security literature frames this balance.

An important perspective linking the three Ss is geopolitics' ontological and epistemological framing. Sovereignty and solidarity emerge as part of an interpretivist geopolitical discourse shaping international and EU energy relations [39]. There is now a renewed focus on geopolitical security framings due to a realist framing of 'us' vs 'them,' or in

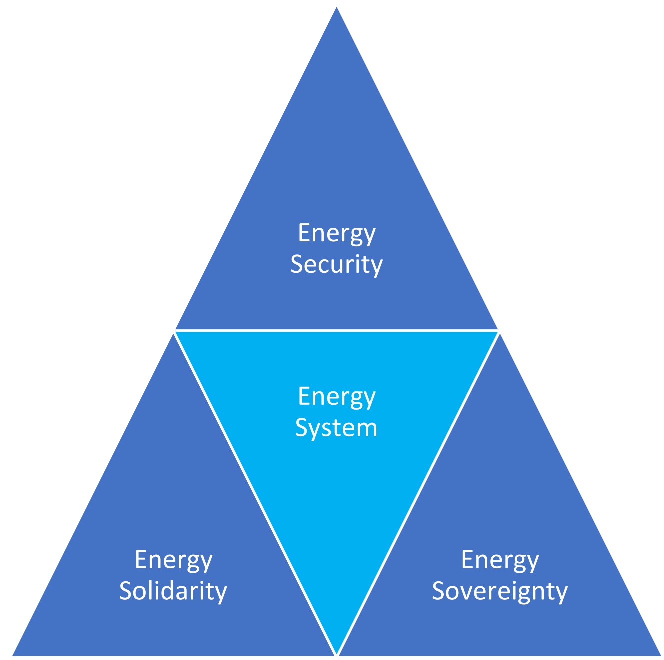

Fig. 1. The Energy Security Triangle of the three Ss.

this case, Europe vs Russia [22]. This section addresses the need for a new analytical re-interpretation of geopolitical logic in the wake of the 2022 crisis [21]. Section 3 provides a brief overview of the methods chosen for this article and the ontological and empirical grounding of energy geopolitics between the EU and Russia.

Section 4 provides an empirical case drawn from secondary sources examining events before and after Russia's full-scale war with Ukraine in 2022. This article utilizes the case of the Nord Stream pipeline and Russia's purposeful manipulation of Europe's gas market until 2022 [20,21]. The weakness in European energy security is highlighted in the limitations of market and regulator tools (soft power) to blunt Russia's and Gazprom's influence (hard power) in Europe's gas market [3,32,40]. After the 2022 invasion of Ukraine, the EU and Member States invoked energy solidarity to impose sanctions and build a more resilient energy market with greater mutual assistance and joint purchases of gas [24,41].

Section 5 draws together the concepts of energy security, sovereignty, and solidarity to answer the two research questions. Drawing on the empirical research exposes how energy solidarity emerges when energy sovereignty is pooled by utilizing power relations to address energy security threats. In 2021, a lack of solidarity enabled Russia to manipulate the EU's gas market, while in 2022 solidarity enabled the imposition of sanctions. The reorganization of energy supply chains and relations fostered a reassessment of European energy security [20]. Section six concludes by outlining research areas that address energy security without Russian energy resources. After more than fifty years of energy interdependence, the turn away from Russia requires a broad reassessment of energy security.

2. Literature review: defining security, sovereignty, and solidarity

Interpretation of energy security largely stems from the 1970s oil crisis, even with acknowledgments of a changed world in the 2000s [2]. National trade barriers were once seen as impeding and undermining energy security in the 1970s [17,42,43]. In 1977, Keohane and Nye, published their seminal book, *Power and Interdependencies* [37], demonstrating the strength of international interdependence. Later, historians and energy scholars identified energy interdependence between Europe and the Soviet Union that improved energy security after the first oil crisis in 1973 [5,7,8,13]. After this event, the concept of energy security expanded through the "globalization" of energy security and later created global and regional "energy interdependence," which was prominent in the 2000s [2].

More recent literature shows an awareness of trade-offs between energy security, energy sovereignty, and sustainable energy. Thaler and Hoffmann label this the "impossible energy trinity" – one of the three needs to be sacrificed [11]. Or, there is now a securitization of the green energy transition – akin to the 1970s response to the oil crisis [21]. EU energy security concerns are meant to be overcome through energy solidarity. Siddi sees the solution to improving energy security as boosting energy efficiency and renewable energy by fostering EU market integration under the moniker of energy solidarity [44]. Energy sovereignty and solidarity exist within the energy security framing and offer more precision in enacting energy policies in relation to other states and sovereign entities.

Rather than perceiving the energy system as operating in an unattainable energy trinity [11], this article proposes a simple recognition that there is an equilibrium – a balance – between energy sovereignty and energy solidarity that supports energy security. My effort in this article is not to side-step the deployment of renewables as a security response but to frame them as infrastructure and policies subservient to the sovereign control of a government or sovereign entity, either supra or sub-national in scale. Renewables do not do away with energy geopolitics. As the energy transition unfolds, the innovation and diffusion of renewable technologies and energy efficiency services remain geopolitical [22,44–46].

In this framing, technological or resource shifts are not considered positive or negative for energy security. For example, Hansen and Moe grapple with renewable energy exports undermining local and national energy sovereignty [27]. This also means low carbon energy imports can generate insecurities if broader security issues, such as defense, economic, and social policies, are not addressed [35]. A sustainable energy system encompassing resource extraction for manufacturing [46] to energy efficiency measures [44]. Producing a stable energy system requires multilateral energy solidarity and security arrangements where sovereignty is asserted and subsumed in geopolitical power relationships. This section unpacks how energy security, sovereignty, and solidarity interact in the EU's energy system - the three Ss.

Acknowledging that times and concepts change, Cherp and Jewell state a new "set of 'polysemic' terms" may be needed for a different context [12]. The four As emerged from the 1970s and 1980s energy security assessment of the oil crisis. With a new era of energy relations arising in Europe, a revision to some guiding terms is in order. This paper proposes the current crisis and the overall energy transition exposes a revised relationship of existing pillars in the EU's energy system: *Energy security*, *energy sovereignty* and *energy solidarity* [11,27,35,44]. These can be labeled the 'three Ss' and can supplement the four As to improve energy security, which is essential for a new European energy era.

2.1. Energy security

Since the outbreak of war in 2022, the use of soft *and* hard power connected to the EU's energy security is overtly on display. Energy security is operationalized by examining the interplay of hard and soft power in the EU's internal energy market [3]. But this is dependent on a broad definition of energy security that is both objective and subjective. The energy system is defined by objective threats, like security of supply and security of demand [47]. In contrast, the subjective lens defines the energy system as operating to produce more security or insecurity [47]. From this subjective position, the impact of energy security is not just physical, but geopolitical, social, political, and economic – it is a "threat multiplier" [35]. This broad definition of energy security enables power relations to mediate the geopolitics of energy.

This broad definition of energy security moves beyond the traditional four As (availability, affordability, accessibility and acceptability). As Cherp and Jewell outline, through a series of questions, the four As is more about interpreting what energy security is; for them the solution emerges through an objective threat assessment with an acknowledgment of particular national values [12]. Whereas Thaler and Hoffman build on the first three As, to accept the International Energy Agency's definition of energy security focused on availability at an affordable price [11]. The weakness is that the three As place too much emphasis on explicit measurements, like price and availability, rather than on deeper implicit measures for constructing energy security – the subjective. This article seeks a greater balance between the objective and subjective assessment of the geopolitics of energy security by utilizing power dynamics between countries. The three Ss approach exposes the motivations, resources, and tools for energy security arrangements.

These power relations utilizing resources and institutional authority provide an important framing to the EU's energy security apparatus. They may highlight and explain diverging perspectives on energy security between EU institutions and Member States. The observation that the shift to renewable energy will make the energy system "less geopolitical in nature" [46] provides a narrow framing of energy security in the EU's internal market. For example, The RePowerEU plan may clash with a European perspective, which uses sovereign natural resources to improve national energy security, such as coal and gas, and even wind power [27,48] while also operating under the legal principles of energy solidarity. These diverging practices and perspectives require reconciliation between the expression of sovereignty and solidarity within a broad framing of energy security.

The "multidimensional concept" of energy security that is both objective and subjective [35,47] is framed through a broad power spectrum of hard and soft power. From a subjective perspective energy security is rooted in geopolitics [45] and may not improve when objective measures address security of supply or national defense [35]. For example, RePowerEU encourages building new LNG facilities (objective) but also targets policies on price stability (objective) for consumers to ensure political support (subjective) and new geopolitical relationships with LNG exporters (subjective) [49].

There is precision in seeking a broader energy security framing this can be done in the context of hard and soft power. The dynamic subjective interrelationships and actions of actors in the energy system are captured along with objective measurements. In a broad framing, the *resources* used and the *actions* taken can be plotted on a spectrum, labeling them as *coercive, inducing, agenda-setting*, or *attracting*. Thereby, a subjective label is placed on the actions that hold objective impacts on energy security. Table 1 provides an overview of the hard and soft power spectrum [36], describing the resources used with additional categories for 'action' and 'examples' that align with the power relationships between Russia, the EU, and Member States. This continuum connects to specific resources, from the military to softer rhetoric and presentable success.

2.2. Energy sovereignty

The emergence of the niche term' energy sovereignty' is noticeable in books beginning in the 1970s [50], presumably due to both the assertion and infringement of sovereignty by Arab countries towards Western oil dependency [13–15]. Disruption in the trade of energy resources, such as oil, affects domestic politics, thereby impinging on the political self-determination of a country [11]. For example, the 1970s oil crisis was "a crisis of sovereignty and political authority for Western governments" because they were under pressure to politically align with Arab oil producers in their war against Israel [13]. This corresponds with the interpretation and construction of energy sovereignty as a social construct [13] tied to political choices and economic activity.

Energy sovereignty is both objective and subjective, just as energy security. Objectively, a state (or a sovereign entity) holds authority over

Table 1
Hard and soft power resources.

Power		Resources	Actions	Example
Hard power	Coercion	Military	War and conflict	Russia's military invasion of Ukraine
	Inducement	Economic	Sanctions	Western Sanctions against Russia
Soft power	Agenda-setting	Institutional	Regulatory powers	EU Gas market
	Attraction	Rhetoric/success	Monetary, political, social benefits	Neoliberal capitalism, democracy, high GDP, monetary reward

Source: Author's revision of Rothman 2011, 51

its natural resources and energy policy [11,27,29]. However, in consideration of the 'three S' framing, energy security and solidarity make sovereign control over resources secondary to international relations. The ability to use hard and soft power means, there are other means to secure energy resources. This perspective runs counter to Schelly et al. who prioritize community-level decision-making [29]. Whereas Hansen and Moe highlight resource nationalism's role in energy sovereignty [27], and Graf frames a concept of state sovereignty over natural resources (oil) from the 1970s oil crisis [13]. My argument does not discount the importance of sovereign control at sub-state units [29] or over natural resources. Instead, it prioritizes sovereign control over *energy policy*, which includes control over natural resources, to ensure energy security.

This article puts forward a multidimensional view of energy sovereignty, just as it does for energy security. Energy sovereignty is defined by a state's ability to control its energy policy [11] to secure its energy system against multidimensional threats [35,47]. Control over its natural resources [27] is secondary and may be wrapped up in broader market and political interdependencies that contribute to a state's political sovereignty [37]. "The concept of sovereignty, thus, connects the spheres of international and domestic politics; it is usually about the state, but it can also be ascribed to governments that have the authority to exert sovereign rights" [13]. Energy sovereignty is rooted in the sovereign authority of the state to conduct external relations.

The justification for embracing a more subjective framing of energy security stems from the historical perspective that sovereignty is a social construct [13] arising from the people. This social construction guides norms, institutional authority, and external relations. Pavel describes two types of sovereignty: 1) people are sovereign who lend their power to democratic self-government, and 2) the political institutions "that carry out the mandates of the people" [51]. This 'divided sovereignty' rests in the people and the institutions, meaning sovereignty can be split between domestic and international institutions [51], such as in the German state *and* the European Union.

Pavel's description of sovereignty acknowledges a more democratic perspective built from Locke. There is the supposition of a 'social contract' that means the state acts in the interests of its citizens [9,51,52]. In contrast, a perspective put forward by Hobbes understands the sovereign is not part of a social contract- "rights are given up and not loaned" [51]. Reflecting on the formation and demise of the Soviet Union, Gaidar describes authoritarian regimes as political structures "not based on traditional legitimacy or on publicly accepted process" [53]. President Putin's Russia, likewise, conforms to an authoritarian system but wields sovereignty as a state inheritance rather than stemming from the people's collective will. The European response of energy solidarity should be seen in light of the fact that Russia's expression of sovereignty is also perceived as a threat to EU and Member State sovereignty.

Due to the embedded norms of the internal market and the tension between EU external policies and national bilateral energy relations [54], Member States struggle to define and retain energy sovereignty [20]. Contested is the role of solidarity between Member States who also attempt to retain national energy sovereignty *and* advance the internal energy market [54]. Although, it is important to remember the founding of the European Coal and Steel Community and all subsequent integration and expansion of the internal energy market is based on an alignment of sovereign interests. Described next is how energy solidarity provides a means to unify sovereignty to improve and operationalize energy security.

2.3. Energy solidarity

Recent publications highlight the emerging importance but opaqueness of the meaning of energy solidarity due to tensions with Russia [20,30,33,44,55]. Since Russia's 2022 invasion of Ukraine, Member States have been pooling their energy sovereignty through acts of energy solidarity, such as sanctions against Russia and joint gas procurement [22,41]. Energy solidarity is emerging as integral to the EU's energy market operations. Since 2009, as a result of the Lisbon Treaty the term *energy solidarity* is enshrined in Articles 122 and 194 of the Treaty on the Functioning of the European Union (TFEU) [30,31,56]. This legal basis for energy solidarity is shaping how energy sovereignty is expressed. This requires not harming the energy interests of other member states or the EU itself [30].

The recent history of energy solidarity stems from Poland's push to include energy solidarity in Article 194 of the TFEU to make energy supply security a joint Member State responsibility [57]. The justification was that national interests needed to give way to a greater good in energy policy and security [31,58]. This line of reasoning exists in the Schuman Plan of utilizing European sovereignty to form solidarity [1]. The Schuman Plan created the ECSC in 1951 and called for concrete action to create "*de facto* solidarity" between six countries [1]. Later, this would expand to foster a federal community of states in the European Economic Community (EEC) [1] and then the EU as more states joined.

This European project can be viewed holistically as pooling (energy) sovereignty, which emerges as solidarity by both people and institutions. Solidarity embeds obligations of justice fostered through market interactions and relations [59]. In a broad framing, values are essential for the EU's common market, which fundamentally "affects the way in which obligations of justice embed, or alter, the functioning of the market" [59]. In a time of war, when energy is used as a weapon [15], energy solidarity more clearly expresses this moral framing to shape the operation of the EU's energy market. Energy solidarity, therefore, describes the collection of sovereign authority expressed through values, policies, and actions in the energy market.

Congruence of energy policies can coalesce as common values emerge in the face of injustices and threats against national energy systems. "Protecting values of different nations" also means protecting national energy systems [60]. In the case of the EU and Member States the common market – and the energy market – is not bereft of values but uses soft and hard power relations to operationalize values and articulate these through access to or exclusion from the common energy market [3]. When these values begin to coalesce to create solidarity, it needs to be asked, "What kinds of principles, policies, and ideals should an affirmation of solidarity commit us to?" [34] Answering this question in the realm of energy security assists in getting to the heart of what values drive EU energy solidarity.

2.4. Methods and conceptual framing

The justification for this article stems from the need to assess the previous energy era and how energy security objectively and subjectively changed. A post-assessment is necessary before moving onto the new era of 'geopolitics of climate transition' [21]. To do this assessment a select number of key events between the EU and Russia are viewed through the abstract lenses of power, sovereignty, and solidarity. Secondary quantitative and qualitative data are used to construct a linear timeline and analysis of events. The attempt is to explain "much by little" [61]. Identifying key processes from particular historical sequences without too much distortion [61]. A historical approach lends itself to consider the creation of a new energy era accounting for social values and political cultures [62].

The rational and research design focuses on assessing the impact of Russian and EU economic measures in the energy field. Qualitative interviews inform the general framing of this article. The research timeline of the interviews extended from December 2021 to December 2022. Two types of interviews were conducted: podcast interviews [63] that are public, and private background interviews. In total, over 25 interviews were conducted. These interviews developed the research questions and established the rationale for the research design. They are not used as primary source of data for this article.

For this article, qualitative and quantitative secondary data are used to structure the analysis. The reason for only using secondary data is based on a more precise delineation of policy approaches and more comprehensive means to summarize the past fifty years of energy relations and perspectives on energy security. In addition, the extensive use of conceptual framings of energy security means a meso-framing of policies and motives at the institutional level is of greater use than individual interpretations of recent events that are still in flux (one reason for experts to grant only 'off-the-record' interviews).

The use of multiple theories and framings, such as realism, constructivism, discursive geopolitics, realist geopolitics, the four As, sovereignty, solidarity, and security, reflect a confluence of conceptual lenses. With considerable overlap, but important differentiations, they enable a triangulated approach that, once combined with the quantitative and qualitative data, improves reliability and validity by looking for consistency in a situation or phenomenon [64]. The author acknowledges the pitfalls of bringing together so many terms and their historical and conceptual nuances. Nonetheless, the overlaps are there and it would be remiss to avoid seeking to understand them. Validity is attempted to be maintained by the use of a historical approach which improves validity by being diachronic (stability through time) and synchronic (within a time period) [65]. This combination delivers a broad analysis rooted in historical analysis of Europe's evolving energy security framing.

Rather than just providing a policy analyst of Europe's response to spiking prices and Russia's invasion of Ukraine since 2021, a broader framing is employed to understand the shift to a new energy era. Looking at the interlinking pillars of EU energy security, sovereignty, and solidarity delivers a conceptual framework for understanding the current policy, technological, and geopolitical transition. The two research questions seek to capture the conceptual shift (RQ1) and the empirical shift (RQ2).

- RQ1: 'How do energy sovereignty and energy solidarity contribute to the EU's energy security?'
- RQ2: 'How did diverging perspectives on energy security lead to Russia threatening EU energy supplies?'

The terms, sovereignty and solidarity are able to bridge the conceptual-empirical bridge because they stem from a philosophical grounding that is both abstract and concrete [51]. In a domestic setting, the energy system is a site of complexity where "states, corporations, and other powerful entities … insert themselves into the daily lives of citizens and consumers" [66,67]. From an international relations perspective, the security of the energy system is a "threat multiplier" [35]. Methodologically approaching an era-spanning analysis is fraught with challenges when intertwining abstract and concrete terms through an ontological framing. This article follows the argument of Hansen and Moe in seeing energy sovereignty as an ontological means to explain the (renewable) energy transition [27] *and* the emerging importance of energy solidarity [30,31]. However, it is also important to understand power relations mediate relations between actors exercising energy sovereignty and solidarity.

To gain this ontological framing of the three Ss, a 'simple' model, is used to provide a dichotomous conceptual framing. The approach uses a double movement in a linear progression: "concrete → abstract, abstract → concrete" [61]. The progression takes the institutional structure of the EU's energy market (concrete), broken down into the concepts of state sovereignty and solidarity (abstract) – which enable the EU's internal energy market to operate – and then reconstitutes these through power relations (abstract) to observe the impact EU energy security and security of supply (concrete), represented by availability and price. This translates into the following: Flow of gas and oil → sovereignty and solidarity, power relations → secure access is perceptible in the price of gas and/or oil. By joining these abstract concepts, the concreteness of energy security operationalizes sovereignty and solidarity in the everyday energy system. This also informs the more concrete example of the energy security triangle (Fig. 1) with the three Ss.

Conceptually and through an ontological lens, this frames Russian actions through a geopolitical realist functionalist lens of strong state control over energy resources and the use of hard power [68]. In contrast, the EU utilized a more discursive and interpretivist framing of geopolitical power that works on a spectrum from a neoliberal market approach to a geopolitical approach with energy sanctions expressing hard power [23]. This approach prioritized energy sovereignty (states choosing for themselves) in supply routes over market solidarity in gas relations with Russia [69]. This view aligns with a critical geopolitical stance, which sees geopolitics as a social construction [45]. For security, this aligns with a critical constructivist approach, which focuses on "how power is integral to the social world and how security is perceived in" culture [70]. In short, in the EU power derives from society where cooperation is prioritized over coercion to achieve an outcome.

Making this split between the geopolitical realist approach utilized by Russia and a discursive geopolitical approach utilized by the EU and Member States aligns with the construction and interpretation of energy sovereignty discussed in the previous section. In 2022, once Russia went to war, the EU deployed hard power through energy sanctions [3,23], drew on common values inherent in the common market [3] and Member States revised their previous view of sovereignty to express solidarity [56]. Geopolitics operationalizes energy solidarity as a unifier for market action [71] where the spectrum of tools from soft to hard power can be deployed [23,36]. The realist geopolitical framing - and the exercise of hard power - is within reach of the EU, but this power only stems from the soft power enabled by the common operation (solidarity) of the EU's energy market.

The limitations of this article stem from the broad perspective on the empirical cases and timeframes, along with the multiple conceptual lenses. This includes the space limitation that prevents critical events from being thoroughly analyzed to cover the whole time frame [61]. Rather the case studies of Germany and Poland are constructed based on secondary sources that hold in-depth research on the topic of Russia's energy relations between specific countries and the EU. Therefore, this study should be perceived as a meta-study with considerable background research that informs the conceptual construction that addresses key events from the case studies. Future research should provide a narrower interpretation of events and examine more particular power structures [52,72]. This includes a narrower focus on the interaction of energy sovereignty and solidarity within the EU and externally. In addition, further clarification on the differences between energy sovereignty at the EU institutional level and Member State level is needed. Nonetheless, as discussed in the next section, a broad perspective provides an essential contribution to summarizing and conceptualizing the historical energy relations between the EU, Member States, and Russia all operating in the shadows of Cold War energy relations of interdependencies.

3. Results: an energy union for solidarity

Since the Cold War, a purposeful Western European strategy was to import Russian energy resources to foster economic growth and interdependence [8,15]. However, after Russia's full-scale war against Ukraine in 2022, the policy of energy interdependence was seen more for its elements of dependence [15]. By January 2023, Russian gas imports had dropped from 47 % in 2019 to below 10 % [73]. This reflects new EU policies that sought to exclude Russian energy resources, which are seen as a direct threat to European energy security. "Since the start of Russia's invasion in Ukraine, Russia has been manipulating gas supply with the aim of undermining EU solidarity and energy security" [71]. It is a priority of the von der Leyen Commission to shift away from Russia due to the manipulation and threat to energy security and solidarity [24].

The history of disputes, cut-offs, and tensions of gas supplies flowing from Russia through Ukraine to countries of the EU are well documented [74–76]. Previously, after the Russian-Ukraine gas cut-off in 2006 and 2009, the EU attempted to build a buttress against short-term disruptions. Fig. 2 is a general representation that provides a brief timeline of key events demonstrating disruptions [77] and how the EU created institutional measures to improve energy security. The following sections will address how these efforts led to a spirit of solidarity and institutionalized energy solidarity.

3.1. Building competition and solidarity in the internal market

After the 2009 Ukraine-Russia gas dispute, which primarily affected the new Member States, the EU took steps to foster greater supply flexibility. They did this through a new regulatory framework, thus applying market logic to solve the security of supply problem. The solution was supported by the new EU agency, The Agency for Cooperation of Energy Regulators (ACER), established in 2010 from the 2009 Third Energy Package. The purpose of ACER was to improve the internal market for electricity and gas by increasing network flexibility to weather any supply disruption [78]. As stated by the European Council, the aim was "No EU Member State should remain isolated from the European gas and electricity networks after 2015 or see its energy security jeopardized by lack of the appropriate connections" [79]. The solution was first to improve the internal energy market by expanding and connecting the infrastructure and enhancing market regulations by transferring authority from the national to a single EU regulator (ACER) [78].

This new focus on a more robust internal market shifted to how energy security was historically addressed. In 2007, long-term upstream contracts (e.g. with Russia) were viewed by the European Parliament as a "positive investment climate and contribute significantly to security of supply" [80]. Indicating the overall favorable view of Russian gas that was held in the EU. Russia's influence in the EU's market was treated as a competition issue. Access and availability were assured under this energy security framing.

In 2009, the Third Energy Package was set out with one eye on Russia and another on increasing competition within the internal market [81] (stemming from the new-found divisions in the Lisbon Treaty and TFEU). A 'Gazprom clause' limited downstream acquisitions in the EU [4]. But it did not enable the Commission to regulate third-party (Russian) access to the EU's gas market. At the same time, the capacity for Russian gas imports increased, as will be discussed next in the case of Nord Stream. Large energy infrastructure projects were built without a European-wide consensus or an eye on energy security [81].

In 2011, drawing on the competition competencies, the EU's Directorate-General for Competition (DG COMP) raided Gazprom offices, along with other gas companies, like Germany's RWE and EON Ruhrgas, which used EU antitrust legislation to focus on upstream supply (outside of the EU) where "competition may be hampered or delayed" [82]. The investigation found unfair pricing in some Member States compared to others (divided between post-communist and Western countries). In addition, impeding cross-border trading and extracting political concession from Poland and Bulgaria – demonstrated that Russian gas trading differentiated between countries. However, as Franza and van der Linde write, "While the EU calls this blackmail, Russia probably regards this as a normal way of conducting bilateral energy diplomacy" [4]. In this context the affordability of gas prices was undermined by Gazprom actions.

In accordance with the Lisbon Treaty and the TFEU, along with the Energy Union concept, the EU sought to provide a unified market where solidarity ensured the security of supply. Energy security regulations were passed to mitigate any accidental or explicit disruption to gas supplies to a single state or a group of Member States. In 2010 and 2017, two regulations were implemented (EU) 994/2010 and (EU) 2017/1938, which outlined mutual assistance mechanisms. These defined regional gas supply country groupings and dealt with interconnections and storage rules, with an EU 'solidarity principle' known as the N-1 rule [19]. The later EU regulation (EU 2017/1938) attempted to address supply threats emerging from a Ukraine-Russia dispute by developing practices of a solidarity mechanism between EU Member States [83]. Although, in 2020, these changes were assessed as having a limited impact on gas security in the EU [84].

The "solidarity mechanism" enables household gas to have priority in the case of an emergency and works to coordinate rules between countries [85]. Thereby, it coordinates how to meet demand in cases of regional gas interruptions – rather than a continental-wide crisis, which

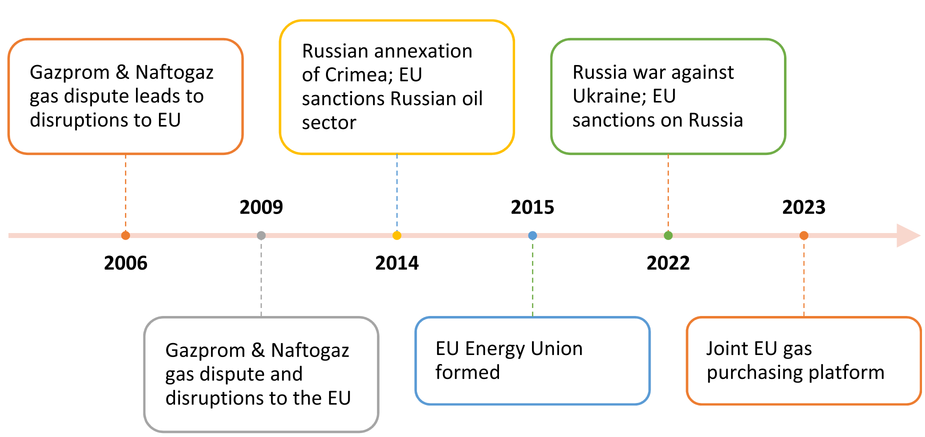

Fig. 2. Key events between Russia and Ukraine affecting European energy security of supply (timeline not to scale).
Source [77]: and author's adjustment

occurred in response to Russia's war with Ukraine. However, this was aimed only at a short-term supply crisis, not a prolonged cut-off from Russia to all EU states [55]. In some cases, energy solidarity within the EU emerges as an oxymoron within a competitive internal market. Member states and companies pursued competitive gas deals while the institutional architecture was put in place to enforce prescribed solidarity mechanisms. Until Russia invaded Ukraine, this 'forced solidarity' was questionable in its success. The following section provides a brief case study of the contradictory pursuit of competition and solidarity.

3.2. National energy sovereignty first: the case of the Nord Stream pipelines

In 2012, the Nord Stream 1 pipeline opened, bringing gas directly from Russia to Germany by traversing under the Baltic Sea. The mixed ownership of German and Russian companies reflects commercial and governmental involvement in building the pipeline. The $11 billion project involved a range of companies, from Gazprom to European companies of Wintersthall Dea, Shell, Uniper, Energie, and OMV [86]. This first project relied on a cooperative environment between companies, governments, and EU institutions. However, permission was also given by the EU to allow it to be built and operated according to EU market rules once the gas is on EU soil. The general acceptability of Russian gas for the EU and Germany was highlighted with the Nord Stream projects.

Later, in the early discussions between Germany and Russia to build Nord Stream 2, the Polish president stated in 2015 that a second Nord Stream "completely ignores Polish interests" and that one must "seriously question unity" in the EU [87]. This German-Polish policy clash was most pronounced because of the accession of post-Communist states in 2004. In the immediate years, little changed towards Russia as a dominant third-party supplier. "Post-accession EU policy held little appreciation of gas dependency on Russia or the inflexibility of gas networks for Eastern Member States. EU policy precluded serious consideration of external supply disruptions or diversification routes during an external crisis" [78].

Poland has pursued a strategy of diversification. Historically, importing 65 % of its gas from the Soviet Union [88] to 45 % in 2020 from Russia. A long-term contract was set to expire at the end of 2022. However, all gas flows were cut off in April 2022 when Poland refused to pay Russia in rubles for gas. Poland had already diversified by pursuing domestic shale gas exploration [89], building the Swinoujscie LNG terminal, and increasing gas interconnectors to neighboring countries. In October 2022, Poland's PGNiG and Norwegian Equinor signed a 10-year agreement to use the newly completed Baltic Pipeline connecting the two countries to import 15 % of Poland's annual demand [90].

In contrast, Germany built closer relations with Russia. The interdependencies of German and Russian energy cooperation were built on a mutual exchange of resources, money, and industrial policy, supporting the economic growth of both countries [8,69]; from the 1970s oil crisis and the necessity of gas during the Cold War for Western Germany, and later in a unified Germany for the *Energiewende* to reduce oil, coal, and nuclear power. At each step, Germany's energy transitions brought it closer to Russia. The building of Nord Streams 1 and 2 between Russia and Germany exemplifies this interdependency.

By building a gas pipeline through the Baltic Sea, Russia bypassed existing pipelines through Ukraine and Poland, delivering supplies directly to Germany. For the Germans, removing the risk from transit states and the constant conflict between Russia and Ukraine would boost the country's security of supply. As Heinrich observes in a media analysis of Poland and Germany's energy debate, German Bundestag Deputy Manfred Grund made a statement regarding the acceptability of Russian gas, "Dependency from Russia is not problematic for Europe or Germany, respectively; it is a problem that 80% of the gas is transported through pipelines crossing Ukraine. Thus, we will be constantly involved in the unresolved conflicts between Russia and Ukraine and so at risk of being held hostage every winter" [91].

For Poland, gas dependency meant unwanted political and economic influence which was unacceptable. Nord Stream was seen as degrading Poland's energy security by German gas companies connecting key Polish energy consumers to the German gas network, thereby threatening the Polish attempt to finance its gas diversification plans [91]. In addition, Poland objected to being bypassed with Nord Stream 1 (and later 2). For Poland, the bilateral relations between Germany and Russia ran counter to EU energy solidarity. A political decision on the part of Russia to cut-off gas flows to Poland would not impact Germany. Later the European Commission would build a gas solidarity mechanism to assist any targeted shut-off to a Member State [83]. Thereby (in theory) rendering the Russian weaponization of gas as a coercive measure mute. Rather than cooperating on energy security, the two countries had different strategies to ensure their own security.

In 2021, a final ruling issued by the EU's Court of Justice (the Grand Chamber) held energy solidarity was a demonstrable assessment criteria [30]. This decision supported an earlier judgement of the General Court of the European Union and the EU's advocate general. The case was the result of Poland suing the European Commission for not assessing a necessary onshore pipeline for Nord Stream 1 through an energy solidarity lens [31]. In the opinion of both the General Court and the Advocate General, Poland is right to contest the ability of Nord Stream 1 to bypass the country and undermine its energy security. Importantly, in light of events on the ground and in the opinion of the Advocate General that the EU's energy system must be assessed not just along the lines of energy security or security of energy supply but also "the 'spirit of solidarity' must inform the objectives of the European Union's energy policy" [31]. The general court ruled that the Commission *and* Member States are required to consider the broader interests of the EU and other Member States [92]. With this ruling, energy solidarity began to be established in case law with far-reaching potential for other energy projects that may affect other Member States [30].

However, to short circuit any further action, in September 2022, Nord Stream 1 and 2 were sabotaged, rendering two of three pipeline branches from both pipelines inoperable. Nonetheless, the ruling was historic in placing energy solidarity ahead of the national acceptability of Russian gas in Germany. The ruling could have slowed the trajectory of increasing cooperation by using Russian gas to assist the energy transition. In 2022, shortly after the outbreak of war in Ukraine, the German government indefinitely suspended the certification process of Nord Stream 2. Nonetheless, the legal impact of energy solidarity remains.

3.3. EU market manipulation: shift towards an energy solidarity

In 2021, Russia stopped meaningfully participating in the EU's gas market by failing to respond to price signals that encouraged the selling of more gas. Both availability and accessibility were directly threatened. Writing in November 2021, as an assessment of low gas storage levels in Europe stated, "The gravity of this situation should not be underestimated" [93]. The report pointed out that Gazprom – controlled by the Russian state – controls the only available spare pipeline capacity into Europe. "Russian gas might well be the EU's Achilles' heel" [93]. During 2021, Gazprom continually shut down and constrained gas transit routes to Europe [19]. The International Energy Agency labels this as a year of "artificial scarcity, caused by Gazprom" [73]. In the 2020s, the shortages caused dramatically higher gas and electricity prices [19] and higher inflation [94].

After February 24th' 2022, when Russia began its war against Ukraine, a geopolitical motive could be read into the gas shortage in Europe. Russia used gas as an economic tool – a weapon of war – for political purposes, just as the Arab members did in 1973 [15]. As sovereignty was an important concept and justification for the 1970s oil crisis, sovereignty also became an essential conceptual framing for explaining actions and reactions. Hard military power was at the center, but the EU's solidarity was also emerging. The EU's energy market was once viewed as a soft power (attraction), but this was now turning to a hard power punitive against Russia.

The quantitative impact of sanctions and the diplomatic fights between Russia and the EU are shown in the data. A year after the war began, European imports of Russian gas dropped from 40 % in 2020, to 23 % in 2022 and to below 10 % by January 2023 [73]. Previously, Europe utilized 60 % of Russia's gas export capacity. By February 2023, the gas pipeline flows had dropped by 80 % [95]. Immediate technological solutions in Europe worked to diversify away from Russian gas by investing in renewables for electricity and heat, along with installing more heat pumps, with the period from 2023 to 2024 projected to see an almost doubling of heat pumps and renewable electricity generation with an overall displacement of 16 BCM by 2024 [96]. Diversification away from Russian resources was active and pronounced.

The future also points to limited room for Russian resources. By 2024, Europe's LNG capacity is set to expand by 34 % from the capacity level in 2021, with Germany building three LNG terminals [97]. The EU's sanction regime largely banned further investments in Russian energy projects [77,98]. Gas demand dropped 19 % between August 2022 and January 2023, with a voluntary commitment to keep consumption 15 % below Russia's pre-invasion level [99].

In 2014, there was the initial call for an "energy union" and a joint purchase of gas to reduce Russian leverage by then Prime Minister Tusk [100]. Reflecting the unity that created the European Coal and Steel Community [100]. After Russia invaded Ukraine the concept of energy solidarity was put into practice. The joint purchase of gas began. The EU Energy Platform was launched in April 2022 to coordinate buying gas with external suppliers on behalf of European countries and companies. The joint platform would reduce the chances of a bidding war for external supplies [101]. In June 2023, the second tender was announced and launched, with the platform displaying "Europe at its best: joining forces and finding solutions," stated Maroš Šefčovič, vice-president for the European Commission [41]. The collapse of energy security relationship fell apart because Russian gas was either no longer accessible, or available, affordable, or even socially and politically acceptable.

3.4. EU oil sanctions

The global nature of the oil market means diversification away from Russian oil for EU Member States requires a different strategy. Before 2022, the EU accounted for almost 50 % of Russian oil exports [73] this continues to decline dramatically. Fig. 3 shows 2.4 million barrels a day (mbd) in early 2022, then dropping to .6 mbd in January 2023. With the overall Russian oil output remaining steady [102]. Western allies decided not to ban Russian oil exports, which would cause market disruptions (higher prices), but institute a price cap [103,104]. By restricting the price that Russia sells oil, this impacts the revenue generated. Fig. 4 shows the correlation between oil exports and generated revenue with a drop in revenue reflecting the lower price while export volumes increased [103]. Before Russia's invasion, oil revenues generated 30–35 % of the Russian government budget, in early 2023, this fell to 23 % [103]. Gas and oil revenue fell 46 % from January 2022 to 2023 [105]. Overall, these falls demonstrate the impact of the Western sanction regime on revenue.

The pursuit of sovereign energy policies characterized EU and Member States until Russia invaded Ukraine in 2022. Despite energy solidarity being enshrined in the TFEU, there was a lack of will on the part of both the EU and Member States to evaluate projects in the context of an EU-wide energy security framing. The contradiction in fostering an internally competitive electricity and gas market while also leaving Member States to negotiate their own external projects and supply routes meant undermining solidarity in energy security. Nord Stream demonstrates the shifting eras in the EU's attempt to be removed from energy projects, then later working to impose conditions for energy security. Once war broke out, the existing platform of energy solidarity enabled economic sanctions to apply in oil and gas. The EU and Member States adopted an era of hard power by deploying sanctions, altering their interpretation of energy sovereignty, and unifying under an energy solidarity umbrella.

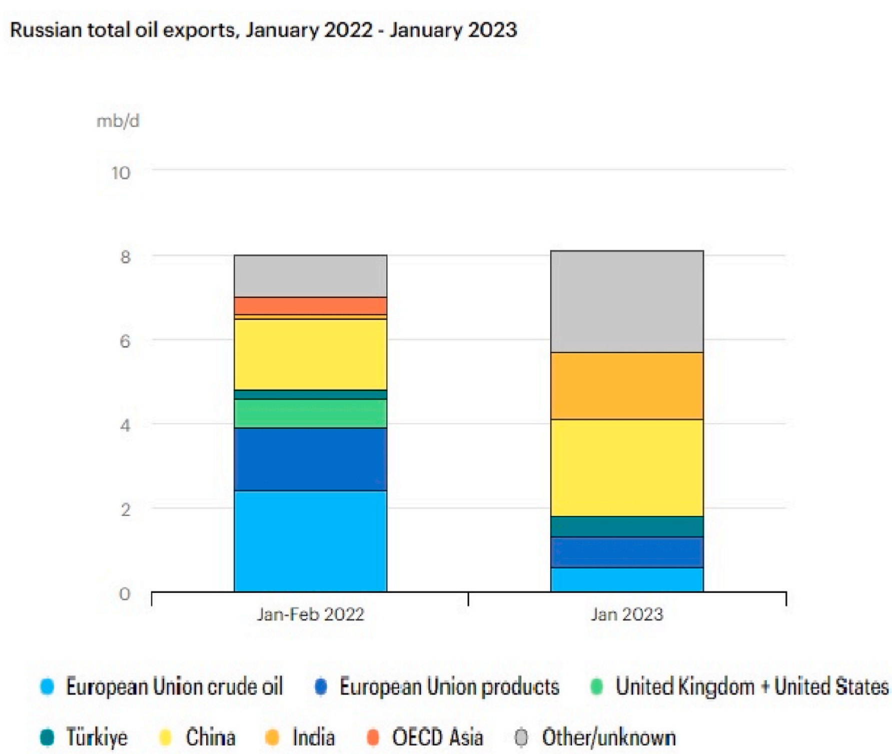

Fig. 3. Russian total oil exports 2022 and 2023.
Source: IEA, 2023 [102].

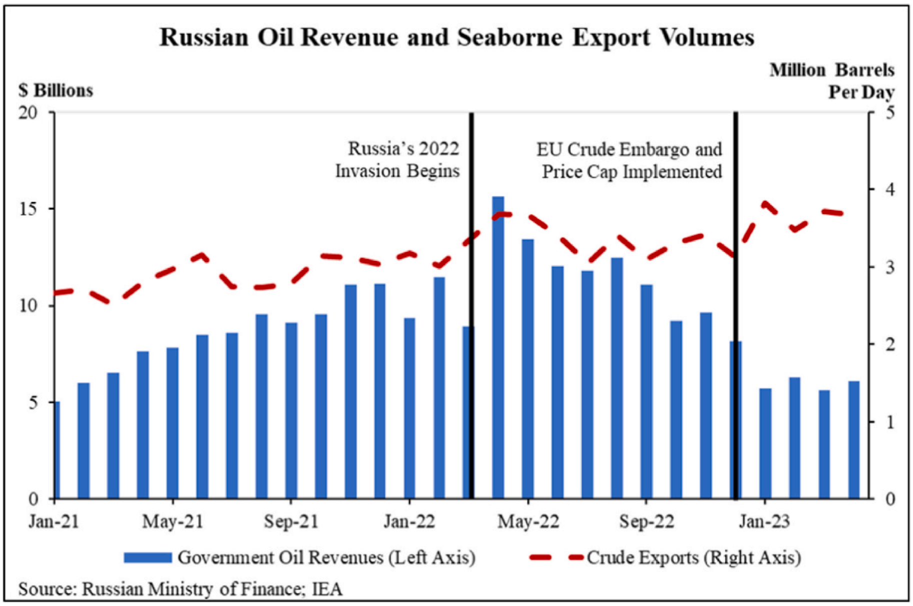

Fig. 4. Russian oil revenue and Seaborn Export volume.
Source: US Department of Treasury, 2023 [103].

4. Implications: creating energy solidarity

The spectrum of power enables a nuanced discussion of energy sovereignty and solidarity in assessing the energy relations between the EU, Member States, and Russia. Sovereignty and solidarity have been at the heart of the European project, from the formation of the ECSC in the 1950s and 1960s, to the oil crisis of the 1970s, the political shifts after 1990, then the formation of the EU's internal market and finally in the 2020s, the breaking of energy relations with Russia. The Polish position of promoting a larger EU energy solidarity underscored that energy security went beyond national borders and short term supply disruptions [57]. Emerging out of the crisis was the role of energy solidarity as both a legal concept [30,31,56] and a more robust policy tool where countries contributed their energy sovereignty to improve their own and the common EU energy security [56].

Energy security is now looking different. Since Russia's 2022 invasion of Ukraine, a renewed European energy sovereignty is developing and becoming more expressive politically and institutionally. Greater authority is given over to EU institutions to restructure the internal energy market. European energy security is used to justify transferring energy sovereignty into a new energy solidarity to protect European values (Fig. 1). The three Ss, emerge as a means to reframe European energy security to project the values of the internal energy market. The two research questions seek to look at the past era and extract key lessons to inform how a more secure European energy system can develop, by asking.

- RQ1: 'How do energy sovereignty, and energy solidarity contribute to the EU's energy security?'
- RQ2: 'How did diverging perspectives on energy security lead to Russia threatening EU energy supplies?'

The following sections address each of the three Ss. This approach enables the research questions to be answered in a systematic way by building up diverging perspectives on energy security. Thereby exposing how sovereignty and solidarity influenced the reformulation of energy security in the EU after Russia's 2022 invasion of Ukraine.

4.1. Energy sovereignty

Impinging on the energy sovereignty of a state works to destabilize it internally and externally. Transferring energy sovereignty to an international institution can create greater stability. Security and stability can be met through cooperation [13,15,106], as the growth of the interdependent global oil market after the oil crisis in the 1970s demonstrates. Sovereign decisions – by Member States –are perceptible in domestic and international policies [11,60]. The incomplete implementation of the EU energy market undermined coherence between national and EU market requirements [54]. A narrow framing of energy sovereignty constitutes a country's ability to independently decide its energy policies, governance structure, and market operations [11]. However, this is incompatible with the broader systemic requirements to make the EU's internal energy market work. The German and Polish diverging perspectives on Nord Stream highlight the strong expression of energy sovereignty rather than a cooperative framing to improve joint energy security.

4.2. Energy solidarity

The EU's birth from the ECSC's founding in 1951 was a move to create "*de facto* solidarity" between six countries [1]. The object was to foster interdependence in the energy and industrial base of warring countries to promote peace and security. Interdependence as a strategy was used with Russia until 2022 [15]. Eventually, as this article demonstrates, the EU and Member States eventually changed their energy strategy and moved to pool more of their energy sovereignty, thereby creating energy solidarity in practice. The EU relied on soft power of attraction to build its neoliberal energy market, albeit with a hard foreign policy edge [3,4,40,107]. Today, the term, energy solidarity assists in understanding how sovereignty acts through the hard power of European geopolitics in the energy sector.

The dramatic weaponizing of energy as a hard power through the use of sanctions, by the EU, requires careful analysis to fully explain the role of energy sovereignty and solidarity. From the 1960s to the 2000s, there was an inherent tension between the striving for a common European energy market and the risks in security of supply from insufficient diversification of sources [8,54]. In 2009, the Treaty of Lisbon came into force. Article 194 of the connected TFEU treaty explicitly splits the responsibilities of the energy system between the EU and Member States [30]. EU institutions would oversee market operations while the choice of technologies and supplies was done by Member States (previously, there was limited delineation of responsibilities) [108]. Thereby dividing authority and responsibility between the EU and Member States [109].

In the past, energy solidarity was a loose-fitting term floated by Poland [57] unable to be actionable in an energy system characterized by divided responsibilities and a lack of supply competition [31]. Energy solidarity was limited to short-term mutual assistance for gas supply disruptions in the N-1 rule and a 'solidarity mechanism', each determined to have limited impact on gas security [19,83,84]. Energy solidarity was a conceptual response to a theoretical threat to energy security.

Rather than regulating energy solidarity into practice, energy solidarity instead emerged *through* practice. Market reforms were necessary by the EU to address high gas prices for both industry and households in 2021 and 2022 (caused by Russia throttling supplies) [19,110,111]. Previously, the Polish and German fight over Nord Stream – as the EU's General Court ruled, neglected to address energy solidarity [31]; demonstrating national energy sovereignty was *de facto modus operandi*. Once Russia started its war against Ukraine the previous groundwork enabled the full powers of energy solidarity to emerge. The Russian oil price cap further demonstrated the role that energy solidarity plays in utilizing hard power (economic sanctions) through joint EU actions. Energy solidarity emerged because the ethical values present between EU Member States and the EU itself, which collectively sought ways to improve energy security by exercising energy sovereignty.

4.3. Energy security

A new era for energy security is emerging that is recognizing the broader and more multidimensional aspects of the energy system as a 'threat multiplier' [35,47]. The energy crisis of the 1970s ushered in a neoliberal era for the globalization of energy supplies [13,15,37,42,112], the 2000s saw even greater levels of interdependence with Russia [7,8]. After the EU's independence with Russia was exposed as dependence [20], the move to an EU level independent energy security framing was pushed. The justification by Germany (and to an extent the EU) to foster energy interdependence with Russia because of availability, accessibility, affordability, and acceptability to gas supplies is over. The rootedness of the 4As in the 1970s security paradigm [12] and the age of external energy interdependence [2,15] for the EU and Member States now seems outdated as Europe shifts to a new energy security order [21,25]. This framing can assist in answering the first research question.

Energy sovereignty and solidarity are not independent variables from energy security – rather they create energy security. In the EU they assist or prevent market participation. The internal energy market requires Member States to transfer some of their energy sovereignty to the EU. When energy is used as a weapon to undermine energy sovereignty the price increases. A high price indicates a failure to secure adequate supplies and an impingement of energy sovereignty, and a failure of energy solidarity.

The failure to find a balance between energy sovereignty and solidarity enabled Russia to expose Europe's energy dependency. The lack of EU energy solidarity enabled Russia to control Europe's spare pipeline capacity [93]. Nord Stream and the connected infrastructure were shown to violate the EU's energy solidarity clauses [30,31,92]. Only by diversifying away from Russia, can Europe reduce its dependence. Previous EU regulatory actions against Gazprom in the market competition utilized soft power with a hard edge [3,40]. Reform of the internal energy market in the Third Energy Package, establishment of ACER, and later competition investigations of Gazprom were attempts to ensure competition and security of supply [4,81–83]. Energy solidarity may have been rejected on abstract conceptual grounds by Germany and the European Commission, but the crisis demonstrated that the protection of national energy sovereignty also weakened energy security.

To answer the second research question; diverging perspectives on energy security enabled Russia to dominate the EU's gas pipeline capacity. Russia was willing to 'come and play' in Europe's gas market [3]. Still, it also built a pipeline (and storage) system it could physically control by determining the amount of gas flow and how much was sold on the market – independent of market conditions [94]. The German perspective that Ukraine was a threat to German energy security, rather than Russia [91], turned out to be an ironic twist once war broke out. Even at the EU level, the EU's soft regulatory power was insufficient for when Russia leveraged and weaponized its gas pipeline capacity [19,23,93].

Since the relationship with Russia was exposed (or turned into) as one of dependency, the EU has demonstrated it can also use hard power. The more recent sanctions regime against Russian oil [103,104] used hard power tools to reduce access or place conditions on access to the EU's energy market. The EU worked to diversify away from Russian gas with voluntary commitments to cut demand and provide a platform for the joint purchase of non-Russian gas along with launching the RePowerEU plan [49,99,101]. It also prevented investments into Russia's energy sector [77,98]. The sanctions against Russia represent the shift to a coercive hard power *but* required solidarity by all EU Member States. For the EU to be effective in expressing and then moving from utilizing soft power (market regulations) to the position of using hard power (sanctions), required energy solidarity between Member States, which shifted some energy sovereignty to the EU thereby improving energy security.

5. Conclusion: realizing energy solidarity

The article set out to do three things: (1) Examine how Russia created internal tension in the EU thereby fostering a weakened energy security environment; (2) Deliver a revised energy security framing for a new energy era without Russian oil and gas; and (3) build an assessment to guide future energy policies to reduce external energy security threats to European energy sovereignty.

The formal framing for actions and coordination in the energy sector rests in legal justification for energy solidarity [30,31]. The lack of energy solidarity *until* Russia's 2022 invasion of Ukraine demonstrated the gradual process of building the EU's institutional architecture, echoing Schuman; concrete achievements to create "a *de facto* solidarity" [1]. Solidarity is perceptible through a spectrum of resources and actions in exercising hard and soft power [36]. Energy sovereignty and solidarity in the EU are reflections of the institutional architecture created by Member States and EU institutions.

The existing definition for energy sovereignty stems from a country's ability to decide its own energy policies, governance, and market structures [11]. This article sought to articulate a more nuanced account of state sovereignty and instances where energy sovereignty facilitates energy solidarity. Rather than energy sovereignty and solidarity opposing each other, energy solidarity emerges when sovereignty is pooled. Energy solidarity is a legal binding term and condition for all Member States necessitating awareness of the energy vulnerabilities of other Member States [30]. Energy solidarity can work to improve energy security rather than undermining energy sovereignty.

This article articulates there are subjective and objective ways to assess energy security. The divergent views on energy solidarity shifted as Europe's energy sovereignty was threatened and Russia's market access was perceived to be financing Russia's war in Ukraine. This exposes how subjective values are embedded in energy security [12]. Norms are essential for making the internal market work where a "degree of solidarity is indispensable" [59]. Subjectivity, therefore, is inherent to energy security – failure to account for operating norms and working in the 'spirit of solidarity' weakens energy security.

A false sense of security can emerge if objective standards are measurements of success. For example, the four As may artificially equate "energy security with supply security" making it more like a state backed exercise in energy procurement [113]. Objectively, security can be measured and balanced. This draws from an 'oil market' framing where the price sends signals which can prompt diversification or prompt higher security margins [2]. However, the assumption is everyone plays in an interdependent (oil) market where "secession is not an option" [2]. This statement could also apply to the gas relations over the past fifty years between Europe and Russia. The EU and Russia have shown, *secession is an option* [15]. The introduction of the three Ss provides a qualitative rule-of-thumb that energy security is also dependent on subjective interpretations of norms and values present in the energy system.

The era of energy interdependencies is not at an absolute end, but it is between Russia and the EU. Assessing a country's – or region's – energy security requires deeper more fundamental concepts to differentiate friend from foe. Energy sovereignty and energy solidarity provide a means to align states between authoritarian regimes and those holding democratic social contracts. Energy solidarity requires a pooling of energy sovereignty based on values and *not* just common economic interests. Interdependency is exposed as dependency in the absence of value to support energy solidarity.

The Schuman Plan, first proposed in 1950, fostered solidarity [1], between six countries. The 2023 joint procurement of gas by the EU demonstrated the pooling of economic means to act through energy solidarity. Solidarity is embedded in the institutions of the EU and relations between Member States. Holding awareness of energy sovereignty and solidarity to assert power can enable more effective EU energy policies. Further theoretical development can utilize the contribution that energy sovereignty makes to state sovereignty. Energy as a weapon of war remains a viable hard power tool in geopolitics [15]. Removing energy as a weapon to impinge European sovereignty requires greater internal energy solidarity.

Credit author statement

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Grammarly in order to improve the grammar. After using this tool/service, the author (s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Michael LaBelle reports financial support and travel were provided by Chatham House. Michael Carnegie LaBelle reports financial support and travel were provided by Open Society Foundations.

Data availability

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References

[1] C.G. Anta, The Europe of jean monnet: the road to functionalism, Null 47 (2021) 773–784, https://doi.org/10.1080/01916599.2020.1856334.
[2] D. Yergin, Ensuring energy security, Foreign Aff. 85 (2006) 69, https://doi.org/10.2307/20031912.
[3] A. Goldthau, N. Sitter, Soft power with a hard edge: EU policy tools and energy security, Rev. Int. Polit. Econ. 22 (2015) 941–965, https://doi.org/10.1080/09692290.2015.1008547.
[4] L. Franza, C. Van Der Linde, in: S.S. Andersen, A. Goldthau, N. Sitter (Eds.), Geopolitics and the Foreign Policy Dimension of EU Energy Security, Energy Union, Palgrave Macmillan UK, London, 2017, pp. 85–98, https://doi.org/10.1057/978-1-137-59104-3_5.
[5] F. Bösch, Energy diplomacy: west Germany, the Soviet union and the oil crises of the 1970s, Hist. Soc. Res./Hist. Sozialforsch. 39 (2014) 165–185.
[6] M. LaBelle, Expanding opportunities: strategic buying of utilities in new EU member states, Energy Pol. 37 (2009) 4672–4678, https://doi.org/10.1016/j.enpol.2009.06.022.
[7] P. Högselius, Red Gas: Russia and the Origins of European Energy Dependence, 1st. ed, Palgrave Macmillan, New York, 2013.
[8] T. Gustafson, The Bridge: Natural Gas in a Redivided Europe, Harvard University Press, Cambridge (Mass.), 2020.
[9] M. LaBelle, Energy Cultures: Technology, Justice, and Geopolitics in Eastern Europe, Edward Elgar Publishing, Cheltenham, UK, 2020. https://www.e-elgar.com/shop/gbp/catalog/product/view/id/16734/s/energy-cultures-9781788975759/.
[10] S. Bouzarovski, M. Bradshaw, A. Wochnik, Making territory through infrastructure: the governance of natural gas transit in Europe, Geoforum 64 (2015) 217–228, https://doi.org/10.1016/j.geoforum.2015.06.022.
[11] P. Thaler, B. Hofmann, The impossible energy trinity: energy security, sustainability, and sovereignty in cross-border electricity systems, Polit. Geogr. 94 (2022) 102579, https://doi.org/10.1016/j.polgeo.2021.102579.
[12] A. Cherp, J. Jewell, The concept of energy security: beyond the four as, Energy Pol. 75 (2014) 415–421, https://doi.org/10.1016/j.enpol.2014.09.005.
[13] R. Graf, Souveränitätsbehauptungen in der Ölkrise. "Project Independence" und globale Interdependenz in den USA 1973/74 | Claiming Sovereignty in the Oil Crisis "Project Independence" and Global Interdependence in the United States, 1973/74, <p>Historical Social Research/Hist. Sozialforsch. 39 (2014) 43–69, https://doi.org/10.12759/HSR.39.2014.4.43-69, 39.
[14] A. Sampson, The Seven Sisters: the Great Oil Companies and the World They Shaped, Viking Press, New York, 1975.
[15] M.C. LaBelle, Energy as a weapon of war: lessons from 50 years of energy interdependence, Global Policy 14 (2023) 531–547, https://doi.org/10.1111/1758-5899.13235.
[16] D. Yergin, The Quest: Energy, Security, and the Remaking of the Modern World, Penguin, 2011.
[17] P. Stevens, The determination of oil prices 1945–1995, Energy Pol. 23 (1995) 861–870, https://doi.org/10.1016/0301-4215(95)00092-W.
[18] M.M. Balmaceda, Russian Energy Chains: the Remaking of Technopolitics from Siberia to Ukraine to the European Union, Columbia University Press, New York, 2021.
[19] M. Mišík, The EU needs to improve its external energy security, Energy Pol. 165 (2022) 112930, https://doi.org/10.1016/j.enpol.2022.112930.
[20] M. Mišík, A. Nosko, Each one for themselves: exploring the energy security paradox of the European Union, Energy Res. Social Sci. 99 (2023) 103074, https://doi.org/10.1016/j.erss.2023.103074.
[21] A.C. Goldthau, R. Youngs, The EU energy crisis and a new geopolitics of climate transition, J. Common. Mark. Stud. (2023), https://doi.org/10.1111/jcms.13539 jcms.13539.
[22] C. Kuzemko, M. Blondeel, C. Dupont, M.C. Brisbois, Russia's war on Ukraine, European energy policy responses & implications for sustainable transformations, Energy Res. Social Sci. 93 (2022) 102842, https://doi.org/10.1016/j.erss.2022.102842.
[23] A. Goldthau, N. Sitter, Power, authority and security: the EU's Russian gas dilemma, J. Eur. Integrat. 42 (2020) 111–127, https://doi.org/10.1080/07036337.2019.1708341.
[24] European Commission, Joint European Action for More Affordable, Secure Energy, REPowerEU: Joint European Action for More Affordable, Secure and Sustainable Energy, 2022. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511. (Accessed 28 October 2023).
[25] M. Siddi, European Energy Politics: the Green Transition and EU–Russia Energy Relations, Edward Elgar Publishing, Cheltenham, UK, 2023, https://doi.org/10.4337/9781035306992.
[26] J. Osička, F. Černoch, European energy politics after Ukraine: the road ahead, Energy Res. Social Sci. 91 (2022) 102757, https://doi.org/10.1016/j.erss.2022.102757.

[27] S.T. Hansen, E. Moe, Renewable energy expansion or the preservation of national energy sovereignty? Norwegian renewable energy policy meets resource nationalism, Polit. Geogr. 99 (2022) 102760, https://doi.org/10.1016/j.polgeo.2022.102760.
[28] M. LaBelle, Breaks in the Wall: History of East-West Energy Relations — Frank Bösch, 2022. http://myenergy2050.com/breaks-in-the-wall-history-of-east-west-energy-relations-frank-bosch-ep-64. (Accessed 11 November 2022).
[29] C. Schelly, D. Bessette, K. Brosemer, V. Gagnon, K.L. Arola, A. Fiss, J.M. Pearce, K.E. Halvorsen, Energy policy for energy sovereignty: can policy tools enhance energy sovereignty? Sol. Energy 205 (2020) 109–112, https://doi.org/10.1016/j.solener.2020.05.056.
[30] K. Huhta, L. Reins, Solidarity in European union law and its application in the energy sector, ICLQ 72 (2023) 771–791, https://doi.org/10.1017/S002058932300026X.
[31] K. Talus, The Interpretation of the Principle of Energy-Solidarity, 2021. https://a9w7k6q9.stackpathcdn.com/wpcms/wp-content/uploads/2021/04/Insight-89-The-interpretation-of-the-principle-of-energy-solidarity-.pdf.
[32] L. Hancher, K. Talus, M. Wüstenberg, Retrospective application of legal rules in the European Union: recent practice in the energy sector, J. Energy Nat. Resour. Law 39 (2021) 65–81, https://doi.org/10.1080/02646811.2020.1804712.
[33] A. Grimmel, Solidarity in the European union: fundamental value or "empty signifier,", in: A. Grimmel, S.M. Giang (Eds.), Solidarity in the European Union, Springer International Publishing, Cham, 2017, pp. 161–175, https://doi.org/10.1007/978-3-319-57036-5_12.
[34] A. Sangiovanni, Solidarity in the European union, Oxf. J. Leg. Stud. 33 (2013) 213–241, https://doi.org/10.1093/ojls/gqs033.
[35] D.K. Jonsson, B. Johansson, A. Månsson, L.J. Nilsson, M. Nilsson, H. Sonnsjö, Energy security matters in the EU energy roadmap, Energy Strategy Rev. 6 (2015) 48–56, https://doi.org/10.1016/j.esr.2015.03.002.
[36] S.B. Rothman, Revising the soft power concept: what are the means and mechanisms of soft power? Journal of Political Power 4 (2011) 49–64, https://doi.org/10.1080/2158379X.2011.556346.
[37] R.O. Keohane, J.S. Nye, Power and Interdependence, second ed., Longman, New York, 1989.
[38] J.S. Nye Jr., Soft Power: the Means to Success in World Politics, Public Affairs, New York, 2004.
[39] G. O Tuathail, J. Agnew, Geopolitics and discourse, Polit. Geogr. 11 (1992) 190–204, https://doi.org/10.1016/0962-6298(92)90048-X.
[40] I. Overland, in: S.S. Andersen, A. Goldthau, N. Sitter (Eds.), The Hunter Becomes the Hunted: Gazprom Encounters EU Regulation, Energy Union, Palgrave Macmillan UK, London, 2017, pp. 115–130, https://doi.org/10.1057/978-1-137-59104-3_7.
[41] M. Sefcovic, Next Steps for the Joint EU Purchasing of Gas, European Commission, 2023. https://ec.europa.eu/commission/presscorner/detail/en/speech_23_3161. (Accessed 21 June 2023).
[42] G. Stigler, The theory of economic regulation, Bell J. Econ. Manag. Sci. 2 (1971) 3–21.
[43] P. Stevens, Oil Markets, Oxford Review of Economic Policy 21 (2005) 19–42.
[44] M. Siddi, The EU's energy union: a sustainable path to energy security? Int. Spectator 51 (2016) 131–144, https://doi.org/10.1080/03932729.2016.1090827.
[45] M. Blondeel, M.J. Bradshaw, G. Bridge, C. Kuzemko, The geopolitics of energy system transformation: a review, Geography Compass 15 (2021) e12580, https://doi.org/10.1111/gec3.12580.
[46] I. Overland, The geopolitics of renewable energy: debunking four emerging myths, Energy Res. Social Sci. 49 (2019) 36–40, https://doi.org/10.1016/j.erss.2018.10.018.
[47] B. Johansson, A broadened typology on energy and security, Energy 53 (2013) 199–205, https://doi.org/10.1016/j.energy.2013.03.012.
[48] Polish Ministry of Energy, Polish Energy Policy to 2040, 2018. https://www.gov.pl/web/energia/polityka-energetyczna-polski-do-2040-r-zapraszamy-do-konsultacji.
[49] R.E. European Commission, REPowerEU at a Glance, 2022. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repowereu-affordable-secure-and-sustainable-energy-europe_en. (Accessed 8 November 2023).
[50] Google, "energy Sovereignty" 1940 - 2019, Google Books Ngram Viewer, 2023. https://books.google.com/ngrams/graph?content=energy+sovereignty&year_start=1940&year_end=2019&corpus=en-2019&smoothing=0. (Accessed 13 June 2023).
[51] C. Pavel, Divided Sovereignty: International Institutions and the Limits of State Authority, Oxford University Press, 2014, https://doi.org/10.1093/acprof:oso/9780199376346.001.0001.
[52] M.C. LaBelle, R. Bucată, A. Stojilovska, Radical energy justice: a Green Deal for Romanian coal miners? J. Environ. Pol. Plann. (2021) 1–13, https://doi.org/10.1080/1523908X.2021.1992266.
[53] Y. Gaidar, Collapse of an Empire: Lessons for Modern Russia by Yegor Gaidar, first ed., Brookings Institution Press, Washington DC, 2007.
[54] T. Maltby, European Union energy policy integration: a case of European Commission policy entrepreneurship and increasing supranationalism, Energy Pol. 55 (2013) 435–444, https://doi.org/10.1016/j.enpol.2012.12.031.
[55] R. Fleming, A legal perspective on gas solidarity, Energy Pol. 124 (2019) 102–110, https://doi.org/10.1016/j.enpol.2018.09.037.
[56] K. Huhta, The scope of state sovereignty under article 194(2) TFEU and the evolution of EU competences in the energy sector, ICLQ 70 (2021) 991–1010, https://doi.org/10.1017/S0020589321000269.
[57] M. Roth, Poland as a policy entrepreneur in European external energy policy: towards greater energy solidarity vis-à-vis Russia? Geopolitics 16 (2011) 600–625, https://doi.org/10.1080/14650045.2011.520865.
[58] A. Dorsman, T. Gök, M.B. Karan (Eds.), Perspectives on Energy Risk, Springer Berlin Heidelberg, Berlin, Heidelberg, 2014, https://doi.org/10.1007/978-3-642-41596-8.
[59] F. De Witte, Justice in the EU: the Emergence of Transnational Solidarity, Oxford University Press, 2015, https://doi.org/10.1093/acprof:oso/9780198724346.001.0001.
[60] A. Cherp, A. Adenikinju, A. Goldthau, F. Hernandez, L. Hughes, J. Jansen, J. Jewell, M. Olshanskaya, R. Soares de Oliveira, B. Sovacool, S. Vakulenko, Chapter 5 - energy and security, in: global energy assessment - toward a sustainable future, cambridge university press, cambridge, UK and New York, NY, USA, and the International Institute for Applied Systems Analysis (2012) 325–384. Laxenburg, Austria, www.globalenergyassessment.org.
[61] A. Sayer, Method in Social Science: a Realist Approach, Routledge, London, 1992.
[62] R.F. Hirsh, C.F. Jones, History's contributions to energy research and policy, Energy Res. Social Sci. 1 (2014) 106–111, https://doi.org/10.1016/j.erss.2014.02.010.
[63] M. LaBelle. My Energy 2050 podcast. OSUN Chatham House Fellowship, 2021, pp. #57–#78, 2022, https://myenergy2050.com/episodes/activities/.
[64] K. Punch, Introduction to Social Research: Quantitative and Qualitative Approaches, Sage Publishers, London, 1998.
[65] D. Silverman, Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction, Sage Publications, London, 1993.
[66] M. Balmaceda, P. Högselius, C. Johnson, H. Pleines, D. Rogers, V.-P. Tynkkynen, Energy materiality: a conceptual review of multi-disciplinary approaches, Energy Res. Social Sci. 56 (2019) 101220, https://doi.org/10.1016/j.erss.2019.101220.
[67] S. Pachauri, D. Urge Vorsatz, M. LaBelle, Synergies between energy efficiency and energy access policies and strategies, Global Policy 3 (2012) 187–197.
[68] O.G. Austvik, The Energy Union and security-of-gas supply, Energy Pol. 96 (2016) 372–382, https://doi.org/10.1016/j.enpol.2016.06.013.
[69] M. Kedzierski, A Dangerous Dependence on Russia. Germany and the Gas Crisis, OSW Centre for Eastern Studies, 2022. https://www.osw.waw.pl/en/publikacje/osw-commentary/2022-02-23/a-dangerous-dependence-russia-germany-and-gas-crisis. (Accessed 13 August 2022).
[70] M.H. Sivonen, P. Kivimaa, Politics in the energy-security nexus: an epistemic governance approach to the zero-carbon energy transition in Finland, Estonia, and Norway, Environmental Sociology (2023) 1–18, https://doi.org/10.1080/23251042.2023.2251873.
[71] European Commission, State of the Energy Union Report 2022, pdf, 2022.
[72] M. LaBelle, In pursuit of energy justice, Energy Pol. 107 (2017) 615–620, https://doi.org/10.1016/j.enpol.2017.03.054.
[73] International Energy Agency, Share of European Union Gas Demand Met by Russian Supply, 2001-2022, Russia's War on Ukraine, 2023. https://www.iea.org/topics/russias-war-on-ukraine. (Accessed 19 June 2023).
[74] K. Smith Stegen, Deconstructing the "energy weapon": Russia's threat to Europe as case study, Energy Pol. 39 (2011) 6505–6513, https://doi.org/10.1016/j.enpol.2011.07.051.
[75] T. Van de Graaf, J.D. Colgan, Russian gas games or well-oiled conflict? Energy security and the 2014 Ukraine crisis, Energy Res. Social Sci. 24 (2017) 59–64, https://doi.org/10.1016/j.erss.2016.12.018.
[76] S. Pirani, J. Stern, K. Yafimava, The Russo-Ukrainian gas dispute of January 2009: a comprehensive assessment. http://www.oxfordenergy.org/pdfs/NG27.pdf, 2009. (Accessed 30 March 2009).
[77] L.A. Lambert, J. Tayah, C. Lee-Schmid, M. Abdalla, I. Abdallah, A.H.M. Ali, S. Esmail, W. Ahmed, The EU's natural gas Cold War and diversification challenges, Energy Strategy Rev. 43 (2022) 100934, https://doi.org/10.1016/j.esr.2022.100934.
[78] M. LaBelle, Regulating for consumers? The agency for cooperation of energy regulators, in: S.S. Andersen, A. Goldthau, N. Sitter (Eds.), Energy Union - Europe's New Liberal Mercantilism?, Palgrave Macmillan, London, 2017, p. 253. http://www.palgrave.com/la/book/9781137591050. (Accessed 31 January 2018).
[79] European Council, Conclusions on Energy, 2011.
[80] European Parliament, Report on Prospect for the Internal Gas and Electricity Market, 2007. http://www.europarl.europa.eu/meetdocs/2004_2009/documents/pr/659/659924/659924en.pdf. (Accessed 6 February 2008).
[81] P. Pikus, Third Energy Package – Security Dilemmas, 2019. https://www.energy-community.org/dam/jcr:0a975947-ef0e-473d-af44-baa420f27af7/Ministry%20of%20Energy%20of%20Poland,Third%20Energy%20Package%20-%20Security%20dilemmas.pdf. (Accessed 14 July 2023).
[82] Gazprom Raided in EU Antitrust Investigation, Financial Times, 2011.
[83] European Council, European Parliament, Regulation (EU) 2017/1938 of the European Parliament and of the Council of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010 (Text with EEA relevance.). http://data.europa.eu/eli/reg/2017/1938/oj/eng, 2017. (Accessed 27 September 2022).
[84] L. Rodríguez-Fernández, A.B. Fernández Carvajal, L.M. Ruiz-Gómez, Evolution of European Union's energy security in gas supply during Russia–Ukraine gas crises (2006–2009), Energy Strategy Rev. 30 (2020) 100518, https://doi.org/10.1016/j.esr.2020.100518.
[85] European Commission, Secure gas supplies, Secure Gas Supplies. (n.d.). https://energy.ec.europa.eu/topics/energy-security/secure-gas-supplies_en (accessed June 21, 2023).

[86] M. Seddon, N. Astrasheuskaya, G. Chazan, Russia Shrugs off Germany's Nord Stream 2 Sanctions, Financial Times, 2022. https://www.ft.com/content/c3adb2c2-2dd9-471a-88c1-8155a335c954. (Accessed 27 April 2022).
[87] Georgi, Duda Slams Russia's Second Baltic Gas Pipeline to Germany, EurActiv | EU News & Policy Debates, across Languages, 2015. http://www.euractiv.com/sections/energy/polish-president-slams-russias-second-baltic-gas-pipeline-germany-317457. (Accessed 2 November 2015).
[88] R. Rosicki, Poland's gas security, Przeglad Politologiczny 1 (2015) 159–172, https://doi.org/10.14746/pp.2015.20.1.11.
[89] M. LaBelle, A state of fracking: building Poland's national innovation capacity for shale gas, Energy Res. Social Sci. 23 (2017) 26–35, https://doi.org/10.1016/j.erss.2016.11.003.
[90] Equinor Reuters, 10-year Deal to Sell Gas to Poland's PGNiG, Reuters, 2022. https://www.reuters.com/business/energy/equinor-10-year-deal-sell-gas-polands-pgnig-2022-09-23/. (Accessed 24 September 2022).
[91] A. Heinrich, Securitisation in the gas sector: energy security debates concerning the example of the Nord Stream pipeline, in: K. Szulecki (Ed.), Energy Security in Europe: Divergent Perceptions and Policy Challenges, Springer International Publishing, Cham, 2018, pp. 61–91, https://doi.org/10.1007/978-3-319-64964-1_3.
[92] General court of the European union, judgment in case T-883/16 Poland v commission. https://curia.europa.eu/jcms/upload/docs/application/pdf/2019-09/cp190107en.pdf, 2019.
[93] J.-A. Vinois, T. Bros, High Energy Prices: Russia Fights Back?, 2021. https://institutdelors.eu/wp-content/uploads/2021/11/PP272_High-energy-prices_Vinois-Bros.pdf.
[94] D. Gros, F. Shamsfakhr, Global Energy Price Inflation with a European Twist, 2022. https://www.europarl.europa.eu/RegData/etudes/IDAN/2022/733997/IPOL_IDA(2022)733997_EN.pdf.
[95] F. Birol, Where Things Stand in the Global Energy Crisis One Year on, IEA, 2023. https://www.iea.org/topics/russias-war-on-ukraine. (Accessed 31 May 2023).
[96] International Energy Agency, Natural Gas Consumption Displaced by Projected Additional Renewable Energy Supply in the European Union in 2023 and Cumulative in 2024, 2023. https://www.iea.org/data-and-statistics/charts/natural-gas-consumption-displaced-by-projected-additional-renewable-energy-supply-in-the-european-union-in-2023-and-cumulative-in-2024.
[97] Energy Information Administration, Europe's LNG import capacity. Today in Energy, 2022 set to expand by one-third by end of 2024, https://www.eia.gov/todayinenergy/detail.php?id=54780. (Accessed 20 June 2023).
[98] European Council, Timeline - EU Restrictive Measures against Russia over Ukraine, 2023. https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/history-restrictive-measures-against-russia-over-ukraine/. (Accessed 31 May 2023).
[99] European Council, Member States Agree to Extend Voluntary 15% Gas Demand Reduction Target - Consilium, Press Release, 2023. https://www.consilium.europa.eu/en/press/press-releases/2023/03/28/member-states-agree-to-extend-voluntary-15-gas-demand-reduction-target/. (Accessed 20 June 2023).
[100] D. Tusk, A United Europe Can End Russia's Energy Stranglehold, Financial Times, 2014. http://www.ft.com/cms/s/0/91508464-c661-11e3-ba0e-00144feabdc0.html#axzz3aUH1vZML. (Accessed 18 May 2015).
[101] European Commission, EU Energy Platform, 2022. https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform_en. (Accessed 21 June 2023).
[102] International Energy Agency, Russian Total Oil Exports, 2023. https://www.iea.org/data-and-statistics/charts/russian-total-oil-exports-january-2022-january-2023. (Accessed 20 June 2023).
[103] U.S. Department, Of the Treasury, the Price Cap on Russian Oil: A Progress Report, 2023. https://home.treasury.gov/news/featured-stories/the-price-cap-on-russian-oil-a-progress-report. (Accessed 31 May 2023).
[104] European Council, EU Agrees on Level of Price Caps for Russian Petroleum Products, 2023. https://www.consilium.europa.eu/en/press/press-releases/2023/02/04/eu-agrees-on-level-of-price-caps-for-russian-petroleum-products/. (Accessed 16 April 2023).
[105] TASS, Russia's Oil and Gas Budget Revenues Down 46% in January, TASS, 2023. https://tass.com/oil-gas-industry/1572379. (Accessed 31 May 2023).
[106] T. Van de Graaf, The "oil weapon" reversed? Sanctions against Iran and U.S.-EU structural power, Middle East Pol. 20 (2013) 145–163, https://doi.org/10.1111/mepo.12040.
[107] S.S. Andersen, N. Sitter, The EU's strategy towards external gas suppliers and their responses: Norway, Russia, Algeria and LNG, in: J.M. Godzimirski (Ed.), New Political Economy of Energy in Europe, Springer International Publishing, Cham, 2019, pp. 49–72, https://doi.org/10.1007/978-3-319-93360-3_3.
[108] Lisbon Treaty, The Lisbon Treaty, 2007. Article 194, http://www.lisbon-treaty.org/wcm/the-lisbon-treaty/treaty-on-the-functioning-of-the-european-union-and-comments/part-3-union-policies-and-internal-actions/title-xxi-energy/485-article-194.html. (Accessed 11 March 2011).
[109] Eur-Lex, Energy, Summaries of EU Legislation, Euro-Lex, Access to European Union Law, 2010. https://eur-lex.europa.eu/EN/legal-content/summary/energy.html. (Accessed 3 July 2023).
[110] A. Pototschnig, J.-M. Glachant, L. Meeus, I. Conti, Consumer Protection Mechanisms during the Current and Future Periods of High and Volatile Energy Prices, Florence School of Regulation, Robert Schuman Centre, 2022, pp. 1–7, https://doi.org/10.2870/920931.
[111] A. Pototschnig, J.-M. Glachant, L. Meeus, P. Rancl, Recent Energy Price Dynamics and Market Enhancements for the Future Energy Transition, Florence School of Regulation, Robert Schuman Centre, 2022, pp. 1–12, https://doi.org/10.2870/920931.
[112] D. Yergin, The Prize: the Epic Quest for Oil, Money & Power, Simon and Schuster, 2012.
[113] K. Szulecki (Ed.), Energy Security in Europe, Springer International Publishing, Cham, 2018, https://doi.org/10.1007/978-3-319-64964-1.