# Transitioning from Conflict to Cooperation: Analysing Energy Security and International Humanitarian Law in the Context of the Russia-Ukraine Conflict

*Ashish Saraswat,* Naveen Chandra Sharma** and Prakash Sharma****

ABSTRACT

The absence of energy security can result in dire repercussions, particularly in the most hazardous situation for human survival i.e., armed conflict. In periods of armed conflict, the probability of energy security difficulties escalates in frequency and magnitude, resulting in significant human rights violations against civilians. The electricity-generating infrastructure is clearly vital and holds significant military relevance, rendering it a frequent target for destruction under the premise of "military necessity." Thus, the resultant disruption of energy services jeopardises the life and fundamental human necessities of the most vulnerable demographic in any armed conflict: the unarmed civilian populace. Energy security is an essential right for human development during peacetime and is vital for survival during wartime. This study examines energy security as a pivotal measure of human development and growth, particularly in the context of the Russia-Ukraine armed conflict, by analysing the significance of energy in meeting essential human requirements. The study seeks to elucidate the expanding aspect of energy

* Assistant Professor, National Law University, Jodhpur, India.
** Assistant Professor (Guest), LC-II, Faculty of Law, University of Delhi, India.
*** Assistant Professor, Rajiv Gandhi School of Intellectual Property Law (RGSoIPL), IIT Kharagpur, India.

access as a human right and its implications during armed conflict, examined via the perspectives of humanitarian law, human rights law, and state practice. It furthermore examines future issues, pathways forward, and recommendations for energy security during armed conflict as an approach for cooperation.

*Keywords:* Energy Security, Armed Conflict, Humanitarian Law, Human Rights, Human Development.

## Prehod od konflikta k sodelovanju: Analiza energetske varnosti in mednarodnega humanitarnega prava v kontekstu rusko-ukrajinskega konflikta

POVZETEK

Pomanjkanje energetske varnosti ima lahko hude posledice, zlasti v najnevarnejši situaciji za človeško preživetje, in sicer v oboroženem spopadu. V obdobjih oboroženih spopadov se verjetnost težav z energetsko varnostjo poveča po pogostosti in obsegu, kar vodi v znatne kršitve človekovih pravic civilistov. Infrastruktura za proizvodnjo električne energije je nedvomno življenjskega pomena in ima velik vojaški pomen, zaradi česar je pogosta tarča uničenja pod predpostavko »vojaške nujnosti«. Posledična prekinitev energetskih storitev tako ogroža življenje in osnovne človeške potrebe najranljivejše demografske skupine v vsakem oboroženem spopadu: neoboroženega civilnega prebivalstva. Energetska varnost je bistvena pravica za človekov razvoj v mirnem času in je ključnega pomena za preživetje v času vojne. Članek preučuje energetsko varnost kot ključno merilo človekovega razvoja in rasti, zlasti v kontekstu rusko-ukrajinskega oboroženega spopada, in sicer z analizo pomena energije pri izpolnjevanju osnovnih človeških potreb. Članek si prizadeva pojasniti vse širši vidik dostopa do energije kot človekove pravice in nje-

gove posledice med oboroženim spopadom, preučevane z vidika humanitarnega prava, prava človekovih pravic in državne prakse. Poleg tega preučuje prihodnje izzive, poti naprej in priporočila glede energetske varnosti med oboroženimi spopadi kot pristop k sodelovanju.

*Ključne besede:* energetska varnost, oborožen spopad, humanitarno pravo, človekove pravice, človekov razvoj.

# 1. Introduction

During peacetime, insufficient access to reliable energy sources can lead to numerous issues. This situation is exacerbated in the most perilous context for human survival, namely an armed conflict, when the absence of energy security might have disastrous consequences[1][2] (International Energy Agency, The Crisis and the Global Response[3] In periods of armed conflict, the probability of energy security difficulties escalates, occurring more frequently and on a bigger scale, resulting in significant human rights violations against civilians.[4] .[5] The armed conflict between Russia and Ukraine has shaken up international politics, market and global economy[6] . The consequences of this new era of armed conflict will undoubtedly be enduring and extensive for society globally, affecting human rights and international humanitarian law (*hereinafter* IHL)[7] .[8] While the conclusion of this war is still unknown, it is certain that

[1] Rutherford, 2020, p.1; Philippe Le, 2013. P.8.
[2] The author argues that "energy is a multi-disciplinary research theme of pressing social relevance".
[3] Energy which is directly connected with resources, at times, especially during war, is linked with developmental failures, war financing, and control of critical resources.
[4] In armed conflicts, "critical infrastructure[s] enabling the delivery of essential services for the civilian population is subjected to repeated attack, incidental harm and misuse by warring parties, resulting in widespread service disruption. The humanitarian impact of this disturbing trend is immediate and long-term, ranging from mass displacement, hunger and food insecurity, energy insecurity, an increased risk of outbreak and spread of infectious disease, reduced livelihoods, and even death".
[5] Giorgou, Zeith, 2013, e-source.
[6] Cornelia, et. al., 2025, p.194.; Genini, 2025, p.1-47; Öncü, 2022,p.21.
[7] Benton, Frogatt, 2022, e-source; ICRC, 2025, e-source.
[8] The failure or collapse of energy supply impacts upon the most basic needs.

there has been a significant impact on right to access of energy and also towards access to food[9] for civilians stuck in such armed conflicts as well as outside the conflict zone. The ongoing energy crisis is the first truly global energy crisis in history, as stated by the International Energy Agency (*hereinafter* IEA)[10], with Europe serving as the core of the disturbance in the energy industry, rendering the situation particularly severe there.[11]

Emerging economies like India also voiced their opinion on the matter at the United Nations Security Council, stating that the energy security crisis which is a direct result of the conflict between Russia and Ukraine, is impacting human life and economy beyond the region, particularly in developing countries, and that the international community must respond collectively to this emerging humanitarian crisis.[12] It is evident that the electricity-generating infrastructure is an essential infrastructure and of general military importance which makes it a usual target for destruction on the basis of "military necessity."[13] Consequently, the interruption of energy services threatens the survival and fundamental needs of the most at-risk group in any armed conflict: the unarmed civilians. Energy security is an indispensable right for human development in times of peace, and it is critical for human survival in times of war. In fact, there are arguments supporting the need to recognise the right to energy security within the existing legal framework or through a multilateral treaty that protects it by establishing obligations, accountability, and essential remedies. In this background, the paper explores energy security as a central yardstick for human development and growth in general, specifically in the context of Russia-Ukraine armed conflict by investigating the role that energy plays in the

[9] Zhou et. al., 2023, e-source; IMF and World Bank, 2022, e-source.
[10] IEA, 2025, e-source,
[11] Hosseni, 2022, p.2-5.
[12] Asian News Network, 2022, e-source; Press Trust of India, 2025, e-source.
[13] Farhat, Nurdin and Basir, 2022, p. 66-67.

fulfilment of fundamental human needs. The paper aims to illuminate the growing importance of energy access as a human right and its ramifications in armed conflict, analysed *via* the perspectives of humanitarian law, human rights law, and state practice. It furthermore addresses future issues, pathways forward, and solutions for energy security amid armed conflict as an approach of cooperation and timely interventions to minimize the impact on the civilian population.

## 2. Applicable Laws in Armed Conflict: International Humanitarian Law and Energy Security

While humanitarian law may also be enforced in situations of armed conflict by human rights institutions and treaty bodies, human rights standards will always be relevant in situations of armed conflict. As far as the scenario of energy is involved, it is plausible that it comes in the situation acknowledged by the International Court of Justice (*hereinafter* ICJ) to which both branches of law are relevant.[14] The above is attributed to the fact that access to energy is concurrently a challenge of human rights at all times as well as an issue of military objective and of survival of the civilian population in armed conflict. The concern now shifts to how they interact with one another, and what this means for the administration and implementation of energy access as a fundamental human right in conflict situations.

The 1949 Geneva Conventions and Protocol I were both accepted by Ukraine and Russia. Both countries are parties to these international legal instruments.[15] Given the relationship between the two areas of law, resolving the question of whether an individual has a legal entitlement or right

[14] Barton et. al., 2004, e-source.
[15] Hilpod, 2023, p.410.

to energy in armed conflict necessitates an analysis of the pertinent rules under both international humanitarian law and human rights law. This is necessary in order to determine if the individual does in fact have such a legal entitlement or right.

According to emerging jurisprudence, numerous regulations within international humanitarian law, although not articulated in rights-based language, are substantially analogous to human rights obligations to respect, protect, and fulfil essential human needs.[16] Access to energy services entails the existence of both affirmative and negative obligations. The affirmative obligation requires refraining from engaging in any combat methods that may lead to the disruption or deprivation of access. Conversely, the negative obligation necessitates the provision of access to energy services. In this context, it is pertinent to analyse the various issues and obligations that may rise related to energy security at the time of armed conflict.

### 2.1. Obligation to Protect Essential Objects Indispensable to the Survival of the Civilian Population

In accordance with the applicable legal framework, the relevant parties must take responsibility for protecting objects essential for the subsistence and well-being of the civilian population. It is generally prohibited to "attack, destroy, remove, or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies, and irrigation works." This prohibition applies to both international and non-international armed conflicts..[17]

This restriction affects energy rights since it has been demonstrated that having access to a reliable source of energy is

[16] Droege, 2007, p. 315.
[17] Droege, 2007, p. 315.

essential for the continued existence of the civilian population. It is a well acceptable fact that energy is essential for the effective operation of numerous civilian facilities., including the »production of foodstuffs,« »drinking water installations and supplies,« »irrigation works,« and many more.[18]

Electric power installations, essential for providing energy access to the civilian population, inherently qualify as "objects indispensable to the survival of the civilian population." Consequently, the civilian population must possess these installations to ensure continuous access to energy for their survival during armed conflict (Additional Protocol I, art 54).[19]

Considering that electrical installations are not only »indirectly linked,« but rather essential, it is only expected to include the majority of the specifically protected items in the broader definition. This is because electricity installations are more than »indirectly linked. Similarly, the prohibition on starving the civilian population necessitates the assurance of an adequate energy supply. Energy is essential for the production, preservation, and processing of food, as well as for the preliminary treatment of potable water.[20] In other words, it is to be understood that there is an inherent duty imposed upon the involved parties in the conflict to safeguard installations pertaining to energy supply, as well as other essential objects that serve the purpose of facilitating access to energy. This duty entails refraining from engaging in acts of aggression, destruction, removal, or rendering such installations and objects inoperable. (AP I, art 54). The majority of nuclear electrical generation facilities possess a multifaceted character, as they encompass combined electricity power systems that cater to the needs of both civilian and military applications.

[18] Brilmayer, Chepiga, 2008, p.414.
[19] Ngai, 2012, p. 579.
[20] Schmid, 2011, p.236.

### 2.2. Protection of Natural Environment

An additional argument supporting the assertion of energy rights is the need to protect the natural environment during periods of armed conflict. The employment of "methods or means of warfare which are intended or may be expected" to inflict "widespread, long-term and severe damage" to the natural environment is specifically prohibited. (AP 1, art 35).[21] This suggests that obligations are at least effective in safeguarding natural energy resources, given that they attempt to ban serious "interference with human life and natural resources" in international armed conflict. If this is the case, then it is feasible to deduce that they should be able to protect natural energy resources. To simplify, Article 35(3) of Additional Protocol I to the Geneva Conventions underscores the significance of safeguarding the natural environment during armed conflict, marking a crucial advancement in the association between environmental conservation and humanitarian principles. The ban on military methods that inflict "widespread, long-term and severe damage" to the environment highlights the understanding that ecological destruction directly threatens human existence and post-conflict rehabilitation. Natural energy resources are not only strategic assets but also essential elements of civilian infrastructure. Their destruction can trigger a series of humanitarian crises, depriving individuals of essential energy resources crucial for food security, healthcare, and sanitation. Therefore, protecting the natural environment during conflict is crucial for ensuring energy security and, consequently, safeguarding human life.

Further, the environmental aspect of energy rights in armed conflict illustrates the interrelation between humanitarian law and environmental law. The concepts of distinction and proportionality, essential to IHL, implicitly apply to the safeguarding of energy-producing ecosystems, and thus

[21] Jensen, 2005, p.145.

mandating combatants to refrain from targeting energy facilities or exploiting resources in manners that jeopardise civilians or disrupt natural systems.[22] This interpretation aligns with the Martens clause.[23] (Cassese, The Martens Clause: Half a Loaf or Simply a Pie in the Sky, EJIL, 2000, 1,205),[24] which mandates compliance with humanitarian principles and public conscience, even when precise legal procedures are lacking.[25] Now, when applied to energy resources, it reinforces the assertion that environmental degradation for military gain contravenes both ecological ethics and humanitarian principles. By protecting the environment, international law indirectly strengthens the right of communities to sustainable and secure energy access during and post-conflict situations.

Similarly, current threats such cyber warfare, sabotage of energy infrastructures, and attacks on oil refineries or nuclear facilities highlight the necessity of expanding environmental protection standards to contemporary energy systems.[26] The changing dynamics of conflict need a reassessment of the applicability of environmental safeguards to energy infrastructures that support ecological stability and civilian protection. Incorporating these safeguards into the wider dialogue on energy rights underscores that the environment is not a marginal issue but a fundamental component of human security. A comprehensive understanding of humanitarian obligations must include the duty to prevent environmental degradation that threatens energy access, as this aligns with the fundamental humanitarian objective of alleviating human suffering and ensuring the essential conditions for life.

[22] Boothby, 2012, p.255.
[23] Cassese, 2000, p.205.
[24] The Martens clause was suggested by Professor Fyodor Fyodorovich Martens in the Preamble of 1899 Hague Convention II (Regulations on the Laws and Customs of War on Land) and got reinstated in 1907 Hague Convention IV (Regulations on the Laws and Customs of War on Land) is considered ambiguous.
[25] Boogard, 2019, p.45.
[26] Abdelkader et. al.,, 2024, e-source.

### 2.3. Protection of Civilian Objects

The safeguarding of civilian objects, although of a broader nature, is also pertinent to the matter of ensuring energy accessibility as a fundamental component of a comprehensive protection framework aimed at preserving the well-being and existence of the civilian population.[27] The fundamental duty to safeguard civilian objects derives from a core principle enshrined within the realm of international humanitarian law, namely, the essential differentiation between civilian populations and objects, as in contrast to military objectives.

Despite the fact that objects that are typically utilised for the purpose of facilitating access to energy services are not expressly referred to as objects that are normally dedicated to civilian purposes, such as "a place of worship, a house or other dwelling or a school", the concept of civilian objects is capable of encompassing energy-related objects such as electric energy installations.[28]. Therefore, there is a continual need to acknowledge explicitly that objects necessary for civilian tasks cannot be completely operational without constant access to energy services in the globe, which is driven by technology and modernization. This is a requirement that will continue to exist as long as there is a need for civilian functions. Provided that they have not already been designated as military objects due to their primary use for military objectives and their effective contribution to military operations. If energy-related objects are not specifically protected as »objects indispensable to the survival of the civilian population« or »works and installations containing dangerous forces,« then the general protection of civilian objects may be able to fill in the gaps and protect energy related objects at the time of a conflict (AP 1, art 56(1) and AP 2, art 15).

[27] Doermann, 2012, p.12.
[28] Sassòli et.al., 2006, p. 68-69.

### 2.4. Protection of Property

The protection of property amid armed conflict is fundamental to IHL, based on the principles of distinction and proportionality.[29] According to Article 52 of Additional Protocol I to the Geneva Conventions, civilian objects are safeguarded against attack unless they are utilised for military purposes. Within the context of armed conflict, it is arguable that the need to respect and defend energy-related property is implied.[30] One may argue that the broader concept of property that has to be protected also encompasses energy-related property because it is essential for the survival and well-being of civilians at the time of armed conflict.

Energy infrastructure, including power plants, fuel depots, transmission lines, and renewable energy projects, represents an essential element of civilian property. The attack on energy infrastructure directly affects critical services such as healthcare, communication, water supply, and transportation, which are vital for human existence. Thus, attacking or injuring such installations contravenes the ban against unnecessary property destruction and contradicts the primary humanitarian objective of mitigating civilian suffering during conflicts. Moreover, the notion of property protection in IHL has progressed to acknowledge that some types of civilian property possess increased importance due to their essential function in preserving life and upholding dignity. In this context, energy-related property surpasses the conventional understanding of material possessions and becomes essential for the fulfilment of other safeguarded rights, like the right to health, adequate housing, and nutrition. The collapse of an energy grid might yield immediate and catastrophic humanitarian repercussions, which not only constitutes a breach of IHL but also a violation of customary norms and human rights duties applicable during conflict (Second Pro-

[29] Peeler, 2019; Boogard, 2019, e-source.
[30] Longobardo, 2019, p.45.

tocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, arts. 7–8, Mar. 26, 1999.).

The need to protect energy-related assets extends beyond merely prohibiting deliberate attacks. It also imposes an obligation for conflicting parties to implement measures to prevent collateral harm to such assets and, when possible, to maintain their operational capacity for civilian use. This is particularly pertinent in contemporary wars because the distinctions between military and civilian infrastructure are increasingly ambiguous, and energy systems frequently fulfil dual-use functions. The protection of energy assets should be seen as a crucial element in maintaining civilian resilience and ensuring a basic level of living during warfare. By including the protection of energy-related assets into the overarching framework of International Humanitarian Law, nation-states can preserve both the letter and spirit of humanitarian law, thereby maintaining human dignity and mitigating the lasting effects of conflict.

### 2.5. Availability of Accommodation and Food

Energy access constitutes an essential element in fulfilling fundamental human necessities, including shelter, sustenance, and water, especially in the context of violent conflicts.[31] (Mottershaw, Economic, Social and Cultural Rights in Armed Conflict: International Human Rights Law and International Humanitarian Law, IJRL, 2008, 450). It is important to note that certain provisions require access to energy services in order to fulfil obligations pertaining to suitable accommodations, sustenance, and access to water facilities. Herein, IHL mandates the humane treatment of protected individuals, including civilians, prisoners of war, and internees, as a non-negotiable requirement. Articles 25 and 26 of the Third Geneva Convention and Articles 85–89 of the Fourth Geneva

[31] Mottershaw, 2008, p.450.

Convention stipulate that conflicting parties must furnish sufficient shelter, sustenance, and water. These fundamental needs are, however, significantly reliant on continuous availability to energy supplies for heating, cooking, water purification, and sanitation. Thus, any intentional targeting or careless damage to energy infrastructure can significantly compromise adherence to these responsibilities, making living conditions untenable for protected individuals. The Russia–Ukraine conflict vividly demonstrates the humanitarian consequences of disrupting energy facilities during armed conflict. Since early 2022, the continued attacks on energy infrastructure have caused extended power outages impacting millions of residents, medical facilities, and shelters.[32] As per International Committee of Red Cross's database on international humanitarian law these actions constitute violations of IHL (ICRC, Rule 54), specifically regarding the prohibition of attacks on civilian infrastructure essential for the survival of the civilian population (Additional Protocol I, Article 54).

Energy deprivation in armed conflict is closely linked to the protection of economic, social, and cultural rights. Elizabeth Mottershaw observes that economic, social and cultural rights remain applicable "during armed conflict",[33] complementing and enhancing the protections provided by IHL. The denial of energy access not only violates humanitarian standards but also infringes upon nations' concurrent human rights obligations to ensure conditions necessary for survival and dignity. The UN Human Rights Monitoring Mission in Ukraine documents that damage to electrical infrastructure has led to adverse effects on food supplies, secure housing, and public health, demonstrating that energy is an essential enabler of humanitarian measures (OHCR, 2024) (OHCR, 2025).[34]

[32] NRC, 2025, e-source.
[33] Mottershaw, 2008, p.450.
[34] Recently, on the night of 29–30 October, 2025, the Russian armed forces conducted another

Furthermore, Customary International Humanitarian Law prohibits the destruction of assets essential for human survival, such as food supplies, agricultural land, and potable water facilities (Rule 54, ICRC Customary IHL Database). Energy installations, though not specifically included, are functionally comparable to these aspects, as they support the systems that provide essential goods and services. Perhaps, for these reasons, the designation of energy infrastructure as critical civilian objects warrants enhanced protection. This developing interpretation will highlight the increasing acknowledgement of protecting energy systems as essential for fulfilling commitments concerning food and shelter under IHL. Integrating energy access protection into humanitarian aid efforts is crucial for fostering resilience during and post-conflict. International organisations, like the UN Development Programme (UNDP) (UNDP, Green Energy Recovery Programme in Ukraine)[35] [36] and the International Organisation for Migration (IOM),[37] have facilitated the swift implementation of decentralised renewable energy systems in Ukraine to energise shelters, hospitals, and water infrastructure. These solutions illustrate a realistic application of IHL's humanitarian goals; ensuring that, despite the destruction of centralised infrastructures, displaced individuals and prisoners of war maintain access to essential resources. Enhancing the normative connection between energy security and humanitarian protection is a significant frontier in current conflict law, integrating classic IHL commitments with modern human rights mandates. Such steps signify how we move from conflict (lack of energy access) to cooperation (restoring energy access) at the time of armed conflict.

large-scale combined attack against multiple regions.

[35] Recently, in October 2025, UNDP and the Ministry for Development of Communities and Territories of Ukraine signed a financing agreement, which officially launched the implementation phase of the Renewable Energy Solutions Programme.

[36] UNDP, 2025, e-source.

[37] International Organisation for Migration, 2024, e-source.

### 2.6. Medical Care and Humane Treatment

The imperative to safeguard physical well-being includes the responsibility towards guarantee of access to energy, as it plays a pivotal role in the delivery of medical services, lack of it has the potential to disrupt the overall healthcare system, and can pose a threat to the physical health of individuals in need of treatment.[38] Electricity, without a doubt, plays an indispensable role in ensuring the smooth functioning of essential medical services and the provision of quality healthcare. Implicitly intertwined with this crucial aspect is the need for the necessary equipment and materials that enable medical units to have access to reliable energy sources.

Furthermore, beyond the mere responsibility of supplying food and essential medical supplies, one could argue that there exists a moral obligation to ensure the provision of suitable shelter for the civilian population. This recognition stems from the understanding that extreme temperatures, be it scorching heat or bone-chilling cold, have the potential to inflict suffering and even claim lives at the time of armed conflict. And, in order to avoid the effect of extreme temperature uninterrupted access to energy services is required.

### 2.7. Essential Supplies for the Survival of Civilian Population

In order to sufficiently safeguard the residents from the harshness of the climate, it is imperative that a shelter possesses the means to obtain electricity in one form or another.[39] The Israeli Supreme Court, in the case of *Jaber Ahmad et al. v. Minister of Defense* (HCJ 9132/07, 30 January 2008), has implicitly acknowledged the inherent significance of providing electricity services during armed conflicts, even within the context of an occupied territory. Through this judgment, it is evident that the court has implicitly acknowledged the

[38] Footer and Rubenstein, 2013, P.170.
[39] Akande and Gillard, 2019, p.6.

crucial nature of electricity and fuel by emphasising that Israel has an obligation to permit their passage to the Gaza Strip. This obligation is rooted in the imperative humanitarian requirements of the civilian population residing in the area. The court has recognised that Israel, in accordance with this obligation, facilitates the provision of fuel and electricity in quantities that are necessary to meet the vital humanitarian needs of the region.

### 2.8. Right to Humanitarian Assistance

The duty associated with the right to humanitarian aid holds significant importance in the context of uninterrupted access to reliable energy services. This is because deprivation frequently arises from either a scarcity of resources or an apparent incapacity to cater to the needs of the population residing within a specific territory.[40] According to Hans-Peter Gasser, there exists a profound responsibility to treat civilians hors de combat with utmost humanity.[41] This obligation extends beyond the mere prohibition of certain behaviours; it also encompasses a compelling duty to take affirmative action. In other words, the right to humanitarian assistance should be viewed not merely as a moral aspiration but as a legal and institutional obligation grounded in IHL.

Here, Gasser's perspective underscores that the obligation to act humanely in circumstances of deprivation, especially during armed conflicts or extensive humanitarian crises, necessitates a proactive responsibility to guarantee the delivery of vital goods and services.[42] This approach strengthens the assertion that humanitarian action should extend beyond urgent relief to include sustainable and inclusive energy solutions that adhere to the ideals of humanism, impartiality, and non-discrimination. This encompasses ensuring access to energy services, which constitute the foundation of essen-

[40] Stoffels, 2004, p.539-540.
[41] Gasser, 1993, p.6.
[42] Gasser, 1993, p.55.

tial infrastructure. The inability to offer or enable such services constitutes a breach of the essential humanitarian principle of humanity, which requires the mitigation of suffering and the safeguarding of human dignity. Consequently, the obligation to provide humanitarian assistance, including energy access, transforms from a mere philanthropic endeavour into a legally binding standard within the overarching framework of civilian protection.

Moreover, in the emerging dialogue on humanitarian law and human rights, energy has become a vital aspect of humanitarian aid.[43] Modern interpretations of the responsibility to help correspond with the concept of "positive obligations" imposed on states and non-state actors to actively create conditions that facilitate the fulfilment of fundamental rights.[44] This approach recognises that deprivation, especially energy poverty, intensifies vulnerability and sustains inequality in war and post-conflict environments. Therefore, humanitarian assistance must adopt a rights-based framework for energy aspect, acknowledging its essential role in preserving health, safety, and human dignity.

## 3. Attack on Energy Infrastructure: A Threat to Energy Security

The war between Russia and Ukraine has had a substantial effect on Europe's ability to maintain its energy security. Due to the fact that Russia is a significant provider of natural gas to Europe, concerns have been raised regarding potential energy supply shortages and price fluctuations. In addition to the economic repercussions, the war has also generated significant concerns regarding the humanitarian consequences of targeting energy infrastructure. These concerns are compounded by the fact that energy infrastructure

[43] Ngai, 2012, p.604; Brook, 2008, p.549-555.
[44] Stoyanova, 2023, p.2.

has been a target.[45] According to IHL, it is illegal to launch assaults against civilian objects, which includes energy facilities. On the other hand, there have been multiple claims that Russian forces have been targeting energy infrastructure in Ukraine. This includes power plants, pipelines, and storage facilities. The effects of these strikes on the civilian population have been nothing short of catastrophic. At the time of writing this paper, there are millions of people in Ukraine who do not have access to power or heat, and many of them have been forced to evacuate their homes. The attacks have also caused a disruption in the delivery of necessary utilities like water and sanitation.

The deliberate attack on electricity infrastructure in Ukraine constitutes a blatant breach of international humanitarian law. These attacks target civilians without discrimination and in disproportionate numbers; as a result, a large number of civilians have been injured or killed.[46] It is imperative that the international community hold Russia accountable for these transgressions and take measures to prevent them from occurring in the future. In addition to the humanitarian repercussions, the targeting of energy infrastructure in Ukraine has significant repercussions for Europe's ability to maintain its level of energy security. Because of the conflict, questions have been raised regarding the safety of the gas supplies that are being supplied by Russia to the European Union, which is highly dependent on Russian gas. If Russia were to shut off gas supplies to Europe, it would have a huge impact on the economy and may lead to severe energy shortages.

The attacks on energy infrastructure in Ukraine serve as a useful reminder of how important it is to maintain secure energy supplies. It is imperative for nations to diversify their energy supply sources and cut their dependency on any one particular provider. Additionally, they need to make in-

[45] Kuzemko et. al., 2022, e-source.
[46] Khater, 2022, p.114.

vestments in energy efficiency and alternative, renewable forms of energy. Because of these steps, the danger of energy shocks will be reduced, and governments will be better equipped to respond to future crises. These steps signify the cooperation and collaboration which is required for access to energy at the time of armed conflicts.

Both Ukraine and Russia are signatories to several regional and international human rights treaties, such as the European Convention on Human Rights (ECHR), the widely recognised International Covenant on Civil and Political Rights (ICCPR), and the crucial Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT)[47] The treaties in question serve as a comprehensive framework, delineating a set of assurances pertaining to essential rights. It is worth noting that a significant number of these rights align with those granted to both combatants and civilians under the umbrella of international humanitarian law. Examples include the unequivocal prohibition of torture and any form of inhuman or degrading treatment, the imperative need for non-discrimination, and the indispensable right to a fair trial. In a display of military might, Russia's armed forces have initiated significant operations targeting Ukraine's energy infrastructure. Among the notable targets are Kharkiv TEC-5, the nation's second-largest heat and power plant, and the Pivdennoukrainsk Nuclear Power Plant located in Mykolaiv.[48]

As per Al Jazeera, in the winter of 2022, a fateful event unfolded in Odessa, Ukraine. It was on the 10th of December when the tranquilly of the city was abruptly shattered by an act of aggression. In a calculated move, Russia unleashed its might upon two vital energy plants, casting a dark shadow over the region. The weapons of choice were none other than 'kamikaze' drones.,. The consequences of this attack were dire, as the very lifeblood of the city, electricity, was

[47] Fortin,, 2022, p.349.
[48] Tobi, 2023, e-source.

threatened to be wiped out for an extended period. The potential ramifications were staggering, with an estimated 1.5 million citizens facing the grim prospect of enduring months without the essential power that sustains their daily lives. Such an act of aggression not only plunged Odessa into darkness but also sent shockwaves throughout the international community.[49] The brazenness and sophistication of the attack served as a chilling reminder of the ever-present threat that looms over in any armed conflict.

As per BBC, Russia openly acknowledged the deliberate nature of Russia's strikes, specifically aimed at Ukraine's vital energy infrastructure.[50] This admission, suggests that Russia harbours no intentions of halting their relentless targeting of power stations and other crucial energy facilities scattered across the Ukrainian landscape.

As per The Guardian, an explosion occurred in the wee hours of the morning on June 6, 2023, at the Kakhovka hydroelectric power facility on the Dnipro river.[51] It caused the dam there to be demolished. The seismic data acquired in Norway point to unequivocal indications of an explosion occurring at the time of the collapse of the dam. The incident has far-reaching implications that cannot be accurately calculated but will be tremendously destructive into the foreseeable future. These consequences will have an impact on Ukraine's economy, agricultural sector, environment, and electricity systems, but will most significantly damage the lives and livelihoods of the people in Ukraine. During the conflict, Russian air attacks have had a significant negative impact on the electricity sector of Ukraine. The combination thermal power facility in Kherson, two solar powered installations in Mykolaiv oblast, and 129 transformer substations were only some of the energy facilities that were simply swamped with water, and this has also meant that there is

[49] N.A., 2022, e-source.
[50] Wright, 2022, e-source.
[51] Beaumont et. al.,, 2023, e-source.

a reduced supply of electricity. After the most recent count, there were still 20,000 people who did not have electricity due to the accident.

The fact that water can no longer be collected from the Kakhovka reservoir to serve the cooling ponds at the Zaporizhzhia nuclear power station poses a unique risk. This water was previously drawn from the reservoir. As a result of the availability of alternate supplies of water, the International Atomic Energy Agency has declared that the Zaporizhzhia Nuclear Power Plant is not facing any new urgent hazards. On the contrary, according to the IAEA, however, the risk has dramatically increased.[52] The alleged actions against Ukraine's energy infrastructure are deemed to be in violation of IHL and the law of armed conflict. Specifically, these actions contravene the provisions outlined in the 1977 Additional Protocol I to the Geneva Conventions, a legally binding treaty ratified by both the Russia and Ukraine.

When used in densely populated areas, explosive weapons pose a significant risk of death or serious injury to civilians, as well as wreaking havoc on civilian property and infrastructure and disrupting vital services like water, electricity, sanitation, and health care. If these systems fail in the autumn or winter, it can dramatically increase the number of people in need of humanitarian aid. According to the principles set forth in international humanitarian law, it is imperative to consider the impact of hostilities on civilians and civilian infrastructure in the planning and execution of all military operations. It is imperative that every conceivable action be undertaken to safeguard and preserve the lives of civilians and critical infrastructure, including but not limited to health facilities, residential dwellings, educational institutions, power generation facilities, and water distribution systems. The Russia-Ukraine conflict has caused significant disruptions within the energy markets, thereby substantially

[52] Ibid.

expediting the preexisting escalation of fuel costs that had been instigated by the global Covid-19 outbreak. In addition to the aforementioned inflationary pressure, it is imperative to highlight that the conflict has significantly raised concerns regarding the broader issue of energy supply security and Europe's reliance on Russia for its energy needs.

On 31st October 2025 Ukraine forces attacked Koltsevaya Pipeline,[53] and as per Ukraine's military intelligence that the pipeline was instrumental in providing fuel for Russian military logistics. As claimed by Ukraine's military intelligence the Koltsevoy pipeline which spans around 400 kilometres is an important source for supply to the Russian Army with jet fuels, gasoline and diesel from refineries in Moscow, Ryazan and Nizhny Novgorod. It has the capacity to transport up to 2.8 million tons of diesel, 3 million tons of jet fuel and 1.6 million tons of gasoline annually.[54] Previously, in late October 2025 Russia attacked Ukraine's energy infrastructure.[55] However, contrary to Ukraine's claims it is being reported that the pipeline was essential for civil, industrial and military purposes.[56]

Given this, both the parties to the armed conflict have been targeting the critical energy infrastructure of each other, which renders the civilian population at the receiving end. The claim by Ukraine that Koltsevoy pipeline was a major source of energy supply to Russian army draws our attention on the aspect of dual use object i.e., energy infrastructure which serves military as well as civil purposes. The neutralization and destruction of dual use object would not attract repercussions of high threshold under humanitarian law in comparison to civilian objects. However, when dual use object energy infrastructure is destroyed a clear distinction has to be made between military energy infrastructure

[53] Akashwani, 2025, e-source.
[54] Syngaivska, 2025, e-source.
[55] Akashwani, 2025, e-source.
[56] Ibid.

also serving civilian purposes and civil energy infrastructure also serving military purposes.[57] to Infuse Meaningfulness to the Notion of "Dual Object Use". Eur. Papers, 2023, 2, 746)

In instances, where a dual use object in relation to energy infrastructure is categorized as a military objective then they become a lawful target in an armed conflict. However, due care must be accorded while deciding it as a military objective, if there are chances of excessive collateral damage to civilian population in violation of the principles of proportionality and distinction. The main challenge arises when the same energy infrastructure object serves both civilian and military objective simultaneously rather than alternatively, it becomes difficult to make the clear distinction in such situations. On the other hand, if a civilian energy infrastructure changes into military energy infrastructure then it loses its immunity at the time of armed conflict, however it can regain its status of civilian object when energy resources are not used for military purposes.[58] (id., 749).

## 4. Conclusion

The access to energy services is an inherent and fundamental right that transcends time and circumstances, extending its reach to both the present and future generations. As a result, energy infrastructure is now considered indispensable.[59] This privilege is applicable not just in times of peace but also during armed conflict. The acknowledgement and protection of this essential human right are vital for the development and welfare of persons in peacetime, and even more critical during periods of armed conflict. This essential right, crucial for human development and survival, must be publicly recognised and protected for all individuals, without exception, irrespective of circumstances or location. The

[57] Capone, 2023, p.746.
[58] Capone, 2023, p.749.
[59] Giorgou and Zeith,, 2023, e-source.

deployment of explosive weapons with a substantial impact radius should be rigorously prohibited in densely populated regions, unless adequate steps are enacted to mitigate their possible detrimental impacts on energy infrastructure.

In the realm of legal matters, it has become increasingly imperative to promptly acknowledge and validate the inherent rights that individuals possess. By doing so, we can establish a more robust shield of safeguarding measures, thereby enhancing the overall level of protection afforded to all within the existing legal framework. The objectives of cooperation and collaboration regarding access to energy at the time of armed conflict can be achieved through the establishment of comprehensive obligations, the imposition of liability on offenders, and the provision of suitable legal redress to ensure energy security.

**BIBLIOGRAPHY AND SOURCES**

Angelica Rutherford, Energy Security and Green Energy: National Policies and Law of the WTO, Springer, Switzerland, 2020.

International Energy Agency, The Crisis and the Global Response, https://www.iea.org/topics/global-energy-crisis (last accessed: 2 Nov. 2025).

Le Billon Philippe, Fuelling War: Natural Resources and Armed Conflicts, Routledge, London, 2013.

Giorgou Eirini and Zeith Abby, When the Lights Go Out: The Protection of Energy Infrastructure in Armed Conflict, Humanitarian Law and Policy, International Committee of the Red Cross, Apr. 20, 2023, https://blogs.icrc.org/app/uploads/sites/102/2023/04/When-the-lights-go-out_-the-protection-of-energy-infrastructure-in-armed-conflict-Humanitarian-Law--Policy-Blog.pdf. (last accessed: 2 Nov. 2025).

Auer, Cornelia, et al., Cascading Socio-economic and Financial Impacts of the Russia-Ukraine War Differ across Sectors and Regions, Communication Earth & Environment, Vol. 6, 2025, 194.

Genini, Davide, How the war in Ukraine has transformed the EU's Common Foreign and Security Policy, Yearbook of European Law, 2025, 1-43.

Öncü, T. Sabri, A War No One Can Win: Ukraine and the Weaponisation of Everything, Economic & Political Weekly, Vol. 57, No. 12, 2022, 20-22.

Giblin, Jennifer et al. (eds.), International Law after Ukraine War. Routledge, London, 2025.

Bryan Frederick et al., Consequences of the Russia-Ukraine War and the Changing Face of Conflict, RAND Corporation, 2025, p.2, file:///Users/prakashsharma/Downloads/RAND_RBA3141-1.pdf. (last accessed: 2 Nov. 2025).

Benton Tim and Frogatt Antony, The Ukraine War and Threats to Food and Energy Security, Chatham House—International Affairs Think Tank, 2022, https://www.chathamhouse.org/2022/04/ukraine-war-and-threats-food-and-energy-security (last accessed: 2 Nov. 2025).

International Committee of the Red Cross, World Bank and United Nations Children's Fund, Joining Forces to Secure Water and Sanitation in Protracted Crises, 2021, https://www.icrc.org/sites/default/files/document_new/file_list/joining_forces_to_combat_protracted_crisis.pdf (last accessed: 2 Nov. 2025).

Zhou Xi-Yin et al., Influence of Russia-Ukraine War on the Global Energy and Food Security, Resources, Recycling, and Recycling, Vol. 188, 2023, https://www.sciencedirect.com/science/article/pii/S0921344922004906 (last accessed: 2 Nov. 2025).

International Monetary Fund and World Bank, Development Committee Paper, The Food and Energy Crisis: Weathering the Storm, The World Bank Group, 2022, https://www.devcommittee.org/content/dam/sites/devcommittee/doc/documents/mgr/Final%20Food%20and%20Energy%20DC2022-0005.pdf (last accessed: 2 Nov. 2025).

International Energy Agency, Russia's War on Ukraine: Analysing the Impacts on Energy Markets and Energy Security, https://www.iea.org/topics/russias-war-on-ukraine (last accessed: 2 Nov. 2025).

Ehsan Hosseini Seyed, Transition Away from Fossil Fuels Toward Renewables: Lessons from Russia-Ukraine Crisis, Future Energy, Vol. 1, No. 1, 2022, pp. 2-5.

Asian News Network, India Highlights Food, Energy Security Challenges Emanating from Ukraine War at UNSC (United Nations Security Council), Times of India (May 06, 2022), https://timesofindia.indiatimes.com/india/india-highlights-food-energy-security-challenges-emanating-from-ukraine-war-at-unsc/articleshow/91358081.cms (last accessed: 2 Nov. 2025).

Press Trust of India, Collateral consequences of Ukraine conflict, including fuel price, affecting Global South: India tells UNGA (United Nations General Assembly, Deccan Herald (Sept. 05, 2025), https://www.deccanherald.com/india/collateral-consequences-of-ukraine-conflict-including-fuel-price-affecting-global-south-india-tells-unga-3713309 (last accessed: 2 Nov. 2025).

Aessa Farhat Salem, Nurdin Rohaida and Bit Basir Salawati, Attacks Against Civilian Objects: An Analysis Under International Humanitarian Law, Hasanuddin Law Review, Vol. 8. No. 1, 2022, pp. 60-78.

Barton et. al., Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment. Oxford University Press, USA, 2010. https://doi.org/10.1093/acprof:oso/9780199271610.001.0001

Hilpold, Peter, Justifying the Unjustifiable: Russia's Aggression against Ukraine, International Law, and Carl Schmitt's "Theory of the Greater Space", Chinese Journal of International Law, Vol. 22, No. 3, 2023, 409-433. https://doi.org/10.1093/chinesejil/jmad039

Droege Cordula, The Interplay between International Humanitarian Law and International Human Rights Law in Situations of Armed Conflict, Israel Law Review, Vol. 40, No. 2, 2007, 310-355.

Brilmayer Lea and Chepiga Geoffrey, Ownership or Use? Civilian Property Interests in International Humanitarian Law, Harvard International Law Journal, Vol. 49, No. 2, 2008, p. 413-446.

Ngai Jenny Sin-hang, Energy as a Human Right in Armed Conflict: A Question or Universal Need, Survival, and Human Dignity, Brooklyn Journal of International Law, Vol. 37, No. 2, 2011, 579-622.

Schmid Evelyne, War Crimes related to Violations of Economic, Social and Cultural Rights, Zeitschrift *für* ausländisches *öffentliches* Recht und Völkerrecht) Heidelberg Journal of International Law, Vol. 71, No. 3, 2011, pp. 523-540.

Jensen, Eric Talbot, The International Law of Environmental Warfare: Active and Passive Damage during Armed Conflict, Vanderbilt Journal of Transnational Law, Vol. 38, No. 1, 2005, 145-185.

Boothby William H., The Law of Targeting. Oxford: Oxford University Press, London, 2012,

Cassese, Antonio, The Martens Clause: Half a Loaf or Simply a Pie in the Sky, European Journal of International Law, Vol. 11, No. 1, 2000, pp. 187-216.

Boogaard, Jeroen van den, Proportionality in International Humanitarian Law: Principle, Rule and Practice. Amsterdam: Universiteit van Amsterdam, Thesis, 2019, 1-461 https://pure.uva.nl/ws/files/39875294/Thesis_complete_.pdf. (last accessed: 2 Nov. 2025).

Abdelkader Sobhy, et al., Securing Modern Power Systems: Implementing Comprehensive Strategies to Enhance Resilience and Reliability against Cyber-Attacks, Results in Engineering, Vol. 23, September 2024, https://www.sciencedirect.com/science/article/pii/S2590123024009022. (last accessed: 2 Nov. 2025).

Doermann Knut, Obligations of International Humanitarian Law, Military and Strategic Affairs, Vol 4, No. 2, 2012, 11-23.

Sassòli, Marco, Cameron Lindsey, Natalino Ronzitti, and Gabriella Venturini, The Protection of Civilian Objects–Current State of the Law and Issues de lege ferenda, Eleven International, 2006, 35-74.

Peeler, Brian, The Persistence of Reciprocity in International Humanitarian Law. Cambridge: Cambridge University Press, 2019, England.

van den Boogaard, Jeroen, Proportionality in International Humanitarian Law: Refocusing the Balance in Practice. Cambridge: Cambridge University Press, 2023, England.

Longobardo, Marco, The Relevance of the Concept of Due Diligence for International Humanitarian Law, Wisconsin International Law Journal, Vol. 37, No. 1, 2019, 45-82.

Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict, Mar. 26, 1999.

Mottershaw Elizabeth, Economic, Social and Cultural Rights in Armed Conflict: International Human Rights Law and International Humanitarian Law, International Journal of Human Rights, Vol. 12, No. 3, 2008, 449-470.

Norwegian Refugee Council, Ukraine: Strikes on energy infrastructure leave millions at risk ahead of winter, 22 Oct. 2025, https://reliefweb.int/report/ukraine/ukraine-strikes-energy-infrastructure-leave-millions-risk-ahead-winter. (last accessed: 2 Nov. 2025).

International Committee of Red Cross, Rule 54. Attacking, destroying, removing or rendering useless objects indispensable to the survival of the civilian population is prohibited, https://ihl-databases.icrc.org/en/customary-ihl/v1/rule54 (last accessed: 2 Nov. 2025).

Office of the United Nations High Commissioner for Human Rights, Attacks on Ukraine's Energy Infrastructure: Harm to the Civilian Population (Sept. 2024), https://ukraine.ohchr.org/sites/default/files/2024-12/ENG_Attacks_on_Ukraine%E2%80%99s_Energy_Infrastructure_Harm_to_the_Civilian.pdf. (last accessed: 2 Nov. 2025).

Office of the United Nations High Commissioner for Human Rights, Russian Attacks on Ukraine's Energy Infrastructure Deepen Civilian Hardship Ahead of Winter, (Oct. 30, 2025), https://ukraine.ohchr.org/en/Russian-Attacks-on-Ukraine-s-Energ-Infrastructure-Deepen-Civilian-Hardship-Ahead-of-Winter. (last accessed: 2 Nov. 2025).

UNDP, Green Energy Recovery Programme in Ukraine, available at: https://www.undp.org/ukraine/projects/green-energy-recovery-programme-ukraine (last accessed: 2 Nov. 2025).

International Organisation for Migration, Ukraine & Neighbouring Countries 2022-2024: 2 Years of Response, https://www.iom.int/sites/g/files/tmzbdl486/files/documents/2024-02/iom_ukraine_neighbouring_countries_2022-2024_2_years_of_response.pdf. (last accessed: 2 Nov. 2025).

United Nations Development Programme, Development Ministry, UNDP Ukraine sign EUR 16.5M deal for renewable energy in social sector buildings, available at: https://www.undp.org/ukraine/press-releases/development-ministry-undp-ukraine-sign-eur-165m-deal-renewable-energy-social-sector-buildings (last accessed: 2 Nov. 2025).

Footer Katherine H.A. and Leonard S. Rubenstein, A human rights approach to health care in conflict, International Review of the Red Cross 95, no. 889 (2013), 167-187.

Akande Dapo, and Emanuela-Chiara Gillard, Conflict-induced Food Insecurity and the War Crime of Starvation of Civilians as a Method of Warfare: The Underlying Rules of International Humanitarian Law, Journal of International Criminal Justice, Vol. 17, No. 4, 2019, 1-26.

Stoffels Ruth Abril, Legal regulation of humanitarian assistance in Armed Conflict: Achievements and Gaps, International Review of the Red Cross, Vol. 86, No. 855, 2004, 515-546.

Gasser Hans-Peter, International Humanitarian Law: An Introduction. Henry Dunant Institute,https://icrcndresourcecentre.org/wp-content/uploads/2016/03/EnglishTotal.pdf. (last accessed: 2 Nov. 2025).

Hampson Francoise J., The Relationship between International Humanitarian Law and Human Rights Law from the Perspective of a Human Rights Treaty Body, International Review of the Red Cross, Vol. 90, No. 871, 2008,549-572.

Stoyanova Vladislava, Framing Positive Obligations under the European Convention on Human Rights Law: Mediating between the Abstract and the Concrete, Human Rights Law Review, Vol. 23, No. 3, 2023, 1-34.

Kuzemko, Caroline, Blondeel Mathieu, Dupont Claire, and Claire Brisbois Marie. Russia's war on Ukraine, European energy policy responses & implications for sustainable transformations, Energy Research & Social Science, 93, 2022:102842. https://doi.org/10.1016/j.erss.2022.102842

Khater, Maya, The Legality of the Russian Military Operations against Ukraine from the Perspective of International Law, Access to Justice in Eastern Europe, 2022, 107-119.

Fortin, Katharine, The relationship between international human rights law and international humanitarian law: Taking stock at the end of 2022?, Netherlands Quarterly of Human Rights, Vol. 40, No. 4, 2022,: 343-353.

Thomas Tobi, Russia-Ukraine War: Zaporizhzhia Nuclear Plant Reconnected to Energy Grid as UN Warns 'One Day Our Luck Will Run out' – as It Happened., the Guardian, (March 9, 2023) https://www.theguardian.com/world/live/2023/mar/09/russia-ukraine-war-live-news-russian-missile-strikes-blackouts-odesa-kharkiv-latest-updates (last accessed: 2 Nov. 2025).

Agency News, Al. Jazeera, Ukraine's Odesa Plunged into Darkness after Energy Facilities Hit, 10 Dec.2022. https://www.aljazeera.com/news/2022/12/10/ukraines-odesa-plunged-into-darkness-after-energy-facilities-hit. (last accessed: 2 Nov. 2025).

Wright George, Putin Vows to Continue Hitting Ukraine's Power Grid, BBC News, 8 Dec. 2022, https://www.bbc.com/news/world-europe-63907803. (last accessed: 2 Nov. 2025).

Beaumont, Peter, Symons v, Scruton Paul, Lucy, Swan, Kirk Ashley, and Morresi Elena, A Visual Guide to the Collapse of Ukraine's Nova Kakhovka Dam, The Guardian, 10 June 2023. https://www.theguardian.com/world/2023/jun/09/visual-guide-ukraine-nova-kakhovka-dam-collapse (last accessed: 2 Nov. 2025).

Akashwani, Government of India, Russia Launches Massive Strikes on Ukraine's Energy Facility: Two Killed, 22 Oct. 2025, https://www.newsonair.gov.in/russia-launches-massive-strikes-on-ukraines-energy-facilities-two-killed/ (last accessed: 2 Nov. 2025).

Syngaivska Soffia, Ukranian Intelligence Blows Up Key Russina Fuel Pipeline Near Moscow, Defense Express1 Nov. 2025, https://en.defence-ua.com/news/ukrainian_intelligence_blows_up_key_russian_fuel_pipeline_near_moscow_video-16337.html#:~:text=Contacts-,Ukrainian%20Intelligence%20Blows%20Up%20Key%20russian%20Fuel%20Pipeline%20Near%20Moscow,civilian%20industry%20and%20military%20operations. (last accessed: 2 Nov. 2025).

Francesca Capone, The Wave of Russian Attacks on Ukraine's Power Infrastructure: An Opportunity to Infuse Meaningfulness to the Notion of "Dual Object Use". European Papers,2023 2, 741-753.

Giorgou Eirini and Zeith Abby, When the lights go out: the protection of energy infrastructure in armed conflict, Humatarian Law & Policy, 2023 https://blogs.icrc.org/app/uploads/sites/102/2023/04/When-the-lights-go-out_-the-protection-of-energy-infrastructure-in-armed-conflict-Humanitarian-Law-Policy-Blog.pdf (. (last accessed: 2 Nov. 2025).