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UKRAINE SETTLEMENT OPTIONS:

Energy

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UKRAINE SETTLEMENT OPTIONS PAPER: ENERGY

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INTRODUCTION

Energy - in the form of gas, nuclear and electricity – has in several different ways played a significant role in the Russia-Ukraine conflict.¹ Energy is also likely to feature in any peace settlement between the two parties. Four distinct points can be identified.

First, for several reasons, despite its extensive energy reserves, most of which are not fully exploited, prior to the 2022 invasion Ukraine depended on Russian imports for its energy supplies. It is foreseeable that an eventual peace settlement will, at least in the short term, include provisions guaranteeing Ukraine's energy security by these means.

Second, a large proportion of Ukraine's energy reserves is located in territories that are currently occupied by Russia. Any peace settlement that does not involve a full recapture of these territories by Ukraine will inevitably need to account for this fact, most likely via some form of joint management and possibly also sharing of export revenues derived from these resources. This point is linked to the previous point, in that Ukraine's energy security depends in part on these reserves (especially gas and coal).

Third, a special issue that may need to be considered in a peace settlement is the management of the Zaporizhzhia nuclear power plant. This power plant is located in territory currently occupied by Russia, although it is very much on the frontline and subject to military attacks. A nuclear installation is particularly high risk, and subject to special rules under international humanitarian law. In addition to any legal action that may result from the risk of a nuclear accident occurring as a result of military activity at the plant,² it is possible that a peace

* I am very grateful for discussions with Jasmina Davis, which contributed greatly to this paper.

¹ Perhaps most obviously to those outside of Ukraine, the conflict has brought into sharp relief the EU's dependence on Russian oil but, most importantly, gas. On 6 October 2022, the EU banned imports of crude oil from Russia by sea, and from 5 February 2023 will prohibit imports of refined oil products: EU Council, '[Russian Oil: EU Agrees on Level of Price Cap](#)' (Press Release, 3 December 2022). Russia has used the EU's dependence on gas to undermine its support for Ukraine by significantly reducing deliveries of gas to Europe (it halted deliveries via Belarus, the Yamal-Europe pipeline and NordStream 1 and reduced deliveries via Ukraine and the TurkStream). For its part, the EU has imposed sanctions on as much of Russia's energy sector as it can afford, putting further pressure on its war economy: Jake Horton and Daniele Palumbo '[Russia Sanctions: How Can the World Cope Without its Oil and Gas?](#)' (BBC News, 16 December 2022). This notwithstanding, almost one year into the conflict, these mutual dependencies have produced an unhappy, if temporary, compromise: Russia continues to export gas to the EU, for which the EU continues to pay (in rubles), and Ukraine continues to allow this gas to be transported through its territory as a transit state, notwithstanding Ukraine's frequent calls for the EU to cease purchasing Russian gas: Stuart Elliott, '[Russian Pipeline Gas Flows to Europe Slip Further in November](#)' (S&P Global, 6 December 2022).

² Tibusay Morgandi and Batuhan Betin, '[Legal Implications of the Military Operations at the Chernobyl and Zaporizhzhia Nuclear Power Plants](#)' (EJIL:Talk! Blog of the European Journal of International Law, 15 April 2022).

settlement may involve the creation of a demilitarised zone around the nuclear power plant, as well as a restoration of electricity production from the power plant to Ukraine's grid.

Fourth, Russia has caused significant damage to Ukraine's energy and electricity infrastructure, which it justifies (at least usually) on the grounds that these are legitimate military objectives. This damage will be likely to feature in any peace settlement covering reparations for infrastructure damage caused by Russia. In addition, it is possible that the direct targeting of this infrastructure infringes Russia's obligations under international humanitarian law, and will need to be considered in any transitional justice arrangements that follow the conflict.

This Options Paper explains these four issues in more detail, and explains how, based on previous peace agreements, there could be a way to account for them in a possible peace agreement between Ukraine and Russia. It is however important to state certain assumptions and qualifications concerning the second and third points, which is that these are only relevant to the extent that the energy resources at issue, and the Zaporizhzhia nuclear power plant, remain on territory occupied by Russia at the end of the conflict. In addition, the options for resolving these two points are presented as concessions on the part of Ukraine, the baseline being Ukraine's rights over its territory under international law.

ISSUES

1. UKRAINE'S ENERGY SECURITY

A key issue underpinning any Ukraine-Russia peace settlement will be Ukraine's energy security, understood as the 'uninterrupted availability of energy resources at an affordable price'³. Ukraine possesses significant quantities of energy resources, albeit many of these are in territories currently occupied by Russia. In particular, Ukraine has significant reserves of natural gas (0.6% of the world's total),⁴ second in Europe to Norway.⁵ Ukraine also has significant reserves of coal (3.2% of the world's total),⁶ although the extent to which this can be a long-term source of energy is debatable, given that Ukraine has committed to phase out coal production by 2040.⁷ Ukraine also has significant potential to produce renewable energy, in particular wind and solar energy.⁸

In principle, Ukraine should be able to be energy self-sufficient. However, since independence in 1991, Ukraine has been dependent on imports to meet its energy needs, and particularly imports from Russia. Prior to Russia's 2022 invasion, Ukraine was importing 30% of its gas (nominally from Eastern European countries, originally from Russia 'reflowing' into

³ International Energy Agency, '[Energy Security](#)'. See also T Morgandi and J Davis, 'Energy Security' in P Delimatsis and L Reins (eds) *Trade and Environmental Law*, Elgar Encyclopedia of Environmental Law, Volume XI (Edward Elgar, 2021).

⁴ British Petroleum, '[Statistical Review of World Energy – Natural Gas](#)' (2021), at 34; the percentage indicated is that of total gas reserves at the end of 2020. Relevantly, Ukraine also holds an amount equivalent to 27% of the EU's gas storage capacity: Alexander Lanoszka, James Rogers and Pratick Triglavcanin, 'A New Energy Policy for Europe: The Significance for Ukraine' (Council on Geostrategy Report, June 2022), at 2, available [here](#).

⁵ BP Report, '[Natural Gas](#)', *ibid*, at 34.

⁶ BP Report, '[Statistical Review of World Energy – Coal](#)' (2021), at 46; the percentage indicated is that of total coal reserves at the end of 2020.

⁷ In its 2021 '[Updated Nationally Determined Contribution](#)', Ukraine committed to phase out coal production by 2035 (later revised to 2040), at 17. See also Ecoaction, '[Ukrainian Government Wobbles on the Coal Phase-Out Date](#)' (22 November 2021).

⁸ Joseph Fraley, '[Renewable Energy in Ukraine: A Solution for European Energy Security and for Shifting the EU GND Eastward](#)', (GLOBSEC, August 2022).

Ukraine),⁹ 70% of its oil (largely from Russia)¹⁰ and 45% of its coal (70% from Russia).¹¹ Ukraine's inability to exploit its own resources over the years can be explained by underinvestment, a lack of infrastructure maintenance, and a weak and non-transparent regulatory framework.¹² Moreover, Ukraine's energy security situation has further deteriorated as a result of the war. The Zaporizhzhia nuclear power plant, which was responsible for 20% of Ukraine's electricity supply,¹³ shut down in September 2022, and beginning in October, Russia has been concertedly targeting Ukraine's energy infrastructure, which is now severely impaired.

Ukraine's long-term aim is energy independence from Russia,¹⁴ ideally through self-sufficiency. This aim would not need to be reflected in a peace settlement. In the short-term, however, it is possible that Ukraine will seek to meet its energy needs, at least in part, by direct or indirect imports (e.g., reverse-flow imports) from Russia, and this would need to be negotiated in connection with a peace settlement. Thus, in his 10-point peace plan at the G20 summit in November 2022, President Zelenskyy said that Russia should be obliged to guarantee reasonable prices for energy exports, in these words:

We must also take a fundamental step so that energy resources are no longer used as weapons. Price restrictions on Russian energy resources should be introduced. If Russia is trying to deprive Ukraine, Europe and all energy consumers in the world of predictability and price stability, the answer to this should be a forced limitation of export prices for Russia. So that the export price was [sic] not higher than the production cost.¹⁵

There are precedents for peace settlements in which one party guarantees, in one way or another, energy supplies to the other party. In the 1979 Egypt-Israel Peace Treaty,¹⁶ for example, Egypt undertook not to discriminate against Israel in respect of bidding for oil in exchange for Israel returning the (now developed) Sinai oil fields that Israel had captured in 1967. The Agreed Minutes attached to this treaty state that:

[I]t is agreed that [normal economic] relations will include normal commercial sales of oil by Egypt to Israel, and that Israel shall be fully entitled to make bids for Egyptian-origin oil not needed for Egyptian domestic oil consumption, and Egypt and its oil concessionaires will entertain bids made by Israel, on the same basis and terms as apply to other bidders for such oil.¹⁷

⁹ US Energy Information Administration, 'Ukraine' (2019), available [here](#). On reverse-flow imports of gas, see Simon Pirani and Katja Yafimava, 'Russian Gas Transit Across Ukraine Post-2019: Pipeline Scenarios, Gas Flow Consequences, and Regulatory Constraints' (Oxford Institute for Energy Studies, February 2016), at 15-8.

¹⁰ US Energy Information Administration, 'Ukraine', above at n 9.

¹¹ Ibid.

¹² International Energy Agency, '[Ukraine Energy Profile](#)' (2020), at 14-34.

¹³ '[Mapping Ukraine's Zaporizhzhia Nuclear Power Plant](#)' (Al Jazeera News, 4 September 2022).

¹⁴ Ukraine is in the process of acceding to the EU which, following Russia's invasion of Ukraine, has itself committed to achieving energy independence from Russia by 2030. This commitment is established under the [REPowerEU Plan](#) adopted by the Commission on 18 May 2022.

¹⁵ President Volodymyr Zelenskyy, '[Ukraine's 10-Point Peace Plan – Speech by the President of Ukraine at the G20 Summit](#)' (President of Ukraine Official Website, 15 November 2022). President Zelenskyy's further restated his 10-point peace plan at his recent meeting with US President Biden and other world leaders in December: Michael Perry, '[Explainer: What Is Zelenskyy's 10-Point Peace Plan?](#)' (Reuters, 28 December 2022).

¹⁶ Treaty of Peace Between Egypt and Israel (adopted 26 March 1979; in force 25 April 1979) 1136 UNTS 115.

¹⁷ Ibid, Agreed Minutes, Annex III, at 194.

Export price guarantees similar to that proposed in the 10-point plan (i.e., linking export prices to production costs) also exist outside of the context of a peace agreement. Article 325 of the 2020 EU-UK Trade and Cooperation Agreement links export prices to domestic prices:

A Party shall not impose a higher price for exports of energy goods or raw materials to the other Party than the price charged for those energy goods or raw materials when destined for the domestic market, by means of any measures such as licences or minimum price requirements.¹⁸

One would therefore expect that something similar could be included in a Ukraine-Russia peace settlement.

In addition, Ukraine might also seek a fall-back guarantee that it can purchase energy from its partners, for example the EU¹⁹ and the US,²⁰ or Norway.²¹ The Egypt-Israel peace settlement also came with a side agreement along these lines. To encourage Israel to participate in the 1979 Egypt-Israel Peace Treaty, in 1975 the US offered the following guarantee:

If the oil Israel needs to meet all its normal requirements for domestic consumption is unavailable for purchase in circumstances where no quantitative restrictions exist on the ability of the United States to procure oil to meet its normal requirements, the United States Government will promptly make oil available for purchase by Israel to meet all of the aforementioned normal requirements of Israel.²²

An equivalent guarantee could similarly be contained in a side agreement between Ukraine and a respective partner. In the event that the EU acts as a guarantor,²³ the EU could continue exporting gas (including potentially Russian reverse-flow gas) and most importantly could now directly export electricity to Ukraine. This was made possible on 16 March 2022 when the Ukraine's grid was synchronised and connected to the European grid (ENTSO-E, the European Network of Transmission System Operators for Electricity).²⁴

¹⁸ UK-EU Trade and Cooperation Agreement (adopted 30 December 2020, in force 1 May 2021), UKTS No 8 (2021), Article 325.

¹⁹ On 15 December 2022, Ukraine asked the EU to supply it with €800m worth of electricity supplies. See President Volodymyr Zelenskyy, '[Macro-financial Support for Ukraine and Strengthening EU Sanctions Against Russia are Also Weapons of Freedom – President's Speech at the Meeting of the European Council](#)' (President of Ukraine Official Website, 15 December 2022).

²⁰ The US agreed to supply LNG to Ukraine. See Gareth Jones, '[Ukraine Seals Gas Supply Deal with US for Winter](#)' (Reuters, 14 September 2022).

²¹ In November 2022, Norway agreed to supply gas to Ukraine via the Baltic Pipe-Europe II pipeline. See Zsuzsanna Szabo, '[Norway to Aid Ukraine's Gas Procurement Ahead of Winter](#)' (Upstream News, 21 November 2022).

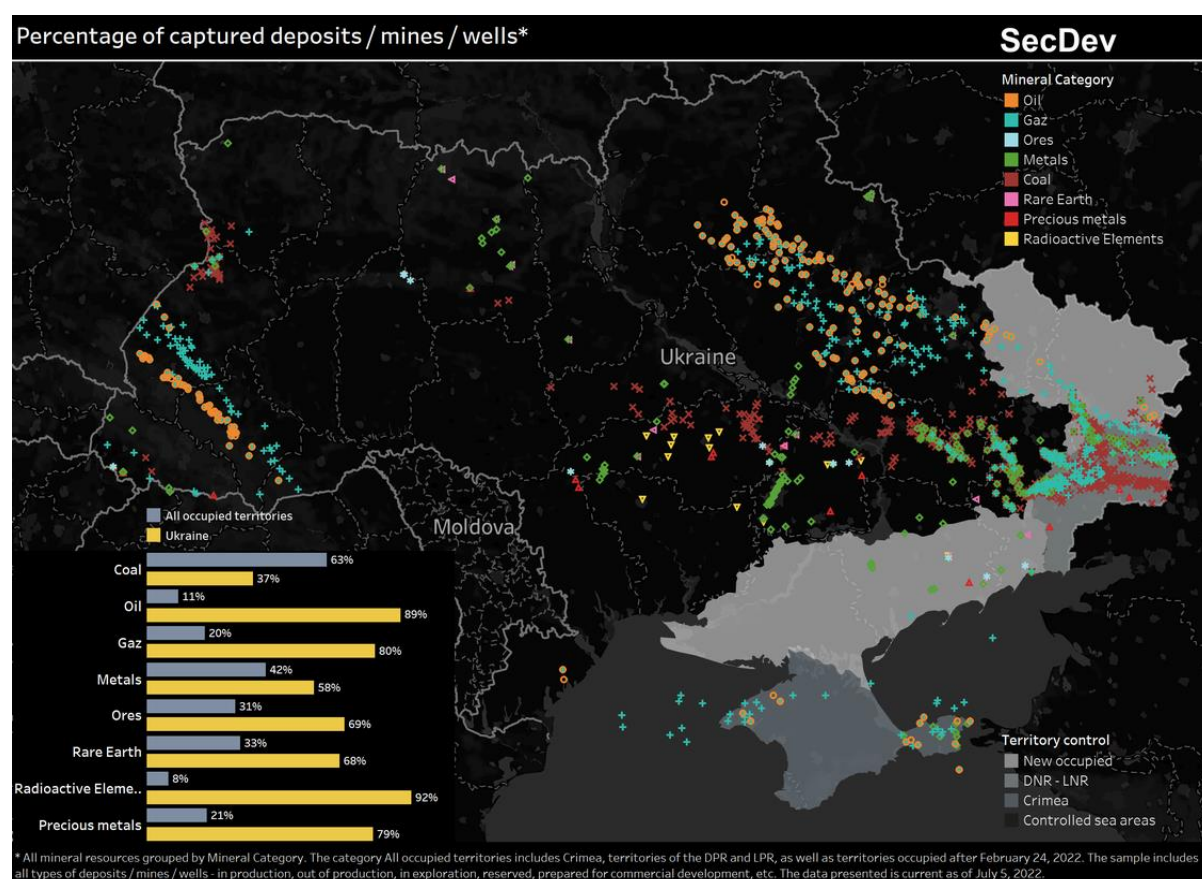
²² Memorandum of Agreement Between the Governments of Israel and the United States (adopted 1 September 1975), para 3(a), available [here](#). The US also went further, and guaranteed Israel oil supplies, at least for its *essential* (ie not 'normal') requirements, in the event that the US could not satisfy its own normal requirements, 'in accordance with the International Energy Agency conservation and allocation formula as applied by the United States Government' (para 3(b)). This MoU was extended until it expired in 2014: Sujata Ashwarya, *Israel's Mediterranean Gas* (Routledge, 2019), at 36-37.

²³ On the potential role of the EU in brokering or facilitating a peace settlement between Ukraine and Russia, see Yanis Varoufakis, '[Why EU Leaders Dread a Ukraine Peace Process](#)' (Project Syndicate, 21 December 2022).

²⁴ In order to reduce Ukraine's reliance on Russia, in 2017 Ukraine and the EU concluded an agreement to synchronise and connect Ukraine's grid to ENTSO-E by 2026. This, however, occurred ahead of time and in record time on 16 March 2022, after Ukraine temporarily disconnected from Russia's grid on 24 February 2022, as part of trials to prove its ability to interconnect its network to the European grid. As it happened, Russia invaded Ukraine a few hours after the disconnection, leaving Ukraine 'orphaned' and entirely disconnected from any other grid. This made the synchronisation and connection to ENTSO-E an absolute and urgent priority. ENTSO-E,

2. ENERGY RESOURCES IN OCCUPIED UKRAINIAN TERRITORY

Ukraine's long-term energy security situation will also be affected by any territorial settlement, as a significant proportion of Ukraine's hydrocarbon reserves are located in territories currently occupied by Russia. Precise figures are hard to determine, but as of July 2022 Russia had seized 63% percent of Ukraine's coal deposits, 20% of its gas deposits and 11% of its oil deposits.²⁵ These figures predate Ukraine's recapture of territory in Kharkiv and Kherson, which includes a small percentage of oil and gas deposits. The overall picture however remains very much the same at the time of writing (December 2022).



Source: SecDev²⁶

How these resources might be treated in a possible peace settlement depends on the territorial settlement that might be reached, as sovereignty over territory (and associated maritime areas) implies ownership rights to resources.

Marc Weller's options paper in this series has set out a range of possible solutions to the conflicting claims of Russia and Ukraine with respect to sovereignty over the territories currently occupied by Russian forces.²⁷ These possible solutions do not foresee Ukraine's acceptance of Russia's annexation of these territories, but they do consider different degrees of

²⁵ Anthony Faiola and Dalton Bennett, '[In the Ukraine War, a Battle for the Nation's Mineral and Energy Wealth](#)' (Washington Post, 10 August 2022).

²⁶ SecDev, '[What Russia's Take Over of Ukraine's Mineral Wealth Means for Global Markets](#)' (August 2022) using data in Faiola and Bennett, '[In the Ukraine War, a Battle for the Nation's Mineral and Energy Wealth](#)'.

²⁷ Marc Weller, '[Ukraine Settlement Options: Territory](#)' (2022).

autonomy for the occupied territories. Broadly speaking, these options involve a peace settlement in which a state with territorial sovereignty agrees to share aspects of that sovereignty with a more or less autonomous entity within its territory.

There are precedents for dealing with energy resources located in an autonomous region in a peace settlement of this type.²⁸ Typically, there are three discrete issues concerning these resources: ownership, revenue sharing and management.²⁹

In such peace settlements, it is rare that a central government would grant ownership rights over natural resources to the autonomous region.³⁰ Typically, the issue of ownership is deferred³¹ or sidestepped,³² or, where ownership is expressly reserved to the central government, this sometimes comes with an ambiguous reference to ownership being vested in the ‘people’.³³ It is even less likely that a central government would cede ownership rights over offshore natural resources located in areas for which the central government is responsible under international law. Given this experience, and Ukraine’s interests, it is very difficult to imagine that Ukraine would cede ownership rights over its resources in any peace settlement.

Ownership is however not in practice the most fundamental issue in peace settlements, and the focus is more typically on the management of the natural resources and the allocation of those resources and, in particular, revenues arising from those resources. These two issues are linked, because the management of a resource has a direct bearing on its value, and hence on revenues derived from the resource (whether from export, sale or exploration and/or exploitation fees).

In terms of management, traditional options in peace settlements include sole management by one party, usually the central government, or joint management by both parties, either bilaterally or via a newly established institution.³⁴ A recent model that might be considered useful when there is very little trust between the parties involves the appointment of a third-party private operator: this is the model set out in the 2022 Israel-Lebanon maritime delimitation agreement.³⁵ This agreement gives an international oil company (Total) the power to negotiate Israel’s share of profits on behalf of Lebanon and without Lebanon’s involvement, even though this could come at a cost to Lebanon.³⁶

²⁸ More generally, even outside of a peace settlement context, there are several models of agreement for the allocation and management of shared and/or disputed resources. See Tibisay Morgandi, *State Energy Agreements* (CUP, forthcoming 2023).

²⁹ Paul R Williams, *Lawyering Peace* (CUP, 2021), Ch 3 for all these references.

³⁰ Two ambiguous examples where some degree of ownership rights may have been transferred are the Bangsamoro and Aceh peace settlements. Article V(2)(d) of the Bangsamoro Organic Law (Law No 11054/2018 of the Philippines) states that ‘the Bangsamoro Government shall exercise its authority over the following matters without prejudice to the general supervision of the President of the Republic of the Philippines: ... (d) Ancestral domain and natural resources’. Article 1.3.3 of the Indonesia-Aceh MoU stated that ‘Aceh will have jurisdiction over living natural resources in the territorial sea surrounding Aceh’, but this was described in terms of *management* of resources in Article 156 of the law implementing this MoU (Law Regarding Governing of Aceh, Law No 11/2006 of Indonesia).

³¹ Eg Art 2.1 of The Comprehensive Peace Agreement Between the Government of the Republic of Sudan and the Sudan People’s Liberation Movement/Army (adopted 9 January 2005), Agreement on Wealth Sharing (adopted 7 January 2004) Ch III, art 2.1; in Williams, above at n 29, at 114.

³² Simon Mason et al, ‘Stepping Stones to Peace? Natural Resource Provisions in Peace Agreements’ in Carl Bruch et al, *Governance, Natural Resources and Post-Conflict Peacebuilding* (Routledge, 2016), at 97.

³³ Williams, above at n 29, at 113, referring to Iraq and Yemen.

³⁴ Both options were set out in Article 160 of the Law Regarding Governing of Aceh, Law No 11/2006 of Indonesia.

³⁵ Israel-Lebanon Maritime Delimitation Agreement, available [here](#).

³⁶ *Ibid*, Section 2(E). See also Tom Pepper, ‘[Total in Key Role in Israel-Lebanon Deal](#)’ (Energy Intelligence, 20 October 2022).

In the present case, the resources at issue would probably be used to meet the energy security needs of Ukraine, including the autonomous regions in addition to generating export revenue. This scenario, and the lack of trust between the parties, would appear to favour an institutionalised solution to resource management. Such an approach also implies a centralisation of the means by which any additional revenue derived from the resources are received and then allocated. Alternative options, such as local taxation, would not appear to be appropriate.³⁷

Finally, there is the question of the allocation of revenue from the sale of the resources. In some peace settlements, revenue is split according to a given formula: Aceh, for example, receives 70% of oil and gas revenues,³⁸ while Bangsamoro receives an even split.³⁹ It is not possible to speculate on how revenues might be split in the present context; suffice to say that Ukraine's energy security needs would be an issue of prime importance.

To summarise, on the assumption that some degree of autonomy is granted to currently occupied Ukrainian regions as part of a peace settlement, a crucial component of such a settlement will be the treatment of energy resources located in those territories (and associated maritime areas). It is very difficult to imagine that Ukraine would cede ownership rights, but there is more scope - and several precedents in existing peace agreements - for a sharing of management, resources and revenues derived from these resources.

3. THE ZAPORIZHZHIA NUCLEAR POWER PLANT

The Zaporizhzhia nuclear power plant, Europe's largest, has been occupied by Russian forces since 4 March 2022, and is on the frontline of the war, having been shelled numerous times since then (for which each side has blamed the other).⁴⁰ The Ukrainian nuclear energy operator, Energoatom, has lost control of the plant, which has been run since its occupation by Ukrainian personnel under instructions from Russian forces and Russia's nuclear energy operator Rosatom.⁴¹ On 1 October 2022, Russian forces detained the director general of the plant, who was released on 3 October 2022 but did not resume his duties thereafter.⁴²

On 5 October 2022, Putin issued a decree declaring the plant Russia's 'federal property', following Russia's annexation claims over the region of Zaporizhzhia alongside other three regions (Donetsk, Kherson and Luhansk).⁴³ The attempted illegal annexation of these four regions (including Zaporizhzhia) has been overwhelmingly condemned by the UNGA, which, on 12 October 2022, adopted Resolution ES-11/4 declaring these actions unlawful and demanding that Russia reverse its decision.⁴⁴ On 30 November, Energoatom appointed a new

³⁷ For further discussion of these options, see Carl Bruch et al, 'Facilitating Peace or Fueling Conflict? Lessons in Post-Conflict Governance and Natural Resource Management' in Bruch et al, *Governance, Natural Resources and Post-Conflict Peacebuilding* (Routledge, 2016), at 962.

³⁸ Article 181 of the Law Regarding Governing of Aceh, Law No 11/2006 of Indonesia.

³⁹ Article XII(34) of the Bangsamoro Organic Law (Law No 11054/2018 of the Philippines).

⁴⁰ Claire Parker and John Hudson, '[Ukraine, Russia Exchange Blame for More Shelling at Nuclear Plant](#)' (Washington Post, 27 August 2022).

⁴¹ World Nuclear News, '[IAEA's Grossi holds 'candid' talks with Rosatom over Zaporizhzhia](#)' (23 November 2022).

⁴² IAEA, '[Update 111 – IAEA Director General Statement on Situation in Ukraine](#)' (4 October 2022).

⁴³ Radio Free Europe/Radio Liberty, '[Zaporizhzhia Nuclear Power Plant Declared Russian 'Federal Property' After Putin Signs Annexation Decrees](#)' (5 October 2022).

⁴⁴ UNGA Resolution [A/RES/ES-11/4](#) (adopted 13 October 2022), operative clauses 3 and 5. The Resolution was supported by 143 votes in favour; there were 5 votes against (Belarus, the Democratic People's Republic of Korea, Nicaragua, Russia and Syria) and 35 abstentions.

acting director of the plant, after rejecting Russia's appointment of the plant's chief engineer as the plant's director.⁴⁵

The plant continued operating and producing energy until 11 September 2022, when the last of its six reactors was shut down.⁴⁶ In the event that the plant continues to be occupied by Russian forces until a possible settlement, a peace agreement would most probably cover the return of the plant (and the territory of Enerhodar where the plant is located) to Ukraine's control. The safe return of the plant to Ukraine might be more easily achieved after placing it under the IAEA's control for a transitional period. The return of the plant to Ukraine would enable it to restart electricity generation from the plant, which, prior to occupation, provided a significant portion of Ukraine's electricity supply.

In the absence of an agreement on the return of the plant to Ukraine's control, it is unrealistic to envisage a scenario in which Ukraine would agree that Russia retain control over the plant. This is for obvious reasons, connected with the inherent risk of a nuclear accident and the continuous threat of the plant being used as a 'radioactive bomb'.⁴⁷ A reasonable compromise might be to put the plant under the control of an independent third party. This is what the IAEA has been suggesting following the establishment of a permanent mission of IAEA experts in situ on 1 September 2022.⁴⁸ Since 6 September 2022, the IAEA Director General has been repeatedly advocating for the establishment of a 'nuclear safety and security zone' around the plant to avoid the risk that a nuclear accident might occur as a result of the shelling of the area around the plant and the disconnection of the plant from a reliable external power line.⁴⁹ In his 10-point peace plan, President Zelenskyy expressly supported this solution, advocating for a retreat of Russian troops and demilitarisation of the area and the transfer of the plant to the control of the IAEA and Ukrainian personnel.⁵⁰ Under this scenario, there would also be a possibility for the plant to restart producing electricity, most likely to be entirely supplied to Ukraine, but, which could, under certain circumstances, be also shared with Russia or one or more autonomous regions. Relevantly, Russia might regard the IAEA's involvement as a guarantee that Ukraine will supply energy to these regions.

4. DAMAGE TO ENERGY INFRASTRUCTURE

Beginning on 10 October 2022, Russia began concertedly targeting Ukrainian energy infrastructure, with at least five mass missile attacks by the beginning of December.⁵¹ This damaged 50% of Ukraine's energy system,⁵² including gas production facilities,⁵³ reduced electricity capacity by 50%, and resulted in widespread blackouts and rationing of electricity

⁴⁵ IAEA, ['Update 134 – IAEA Director General Statement on Situation in Ukraine'](#) (2 December 2022).

⁴⁶ IAEA, ['Update 112 – IAEA Director General Statement on Situation in Ukraine'](#) (5 October 2022).

⁴⁷ These were the words used by President Zelenskyy in his 10-point peace plan: President Zelenskyy, ['Ukraine's 10-Point Peace Plan'](#), above at n 15.

⁴⁸ The mission has been labelled the IAEA Support and Assistance Mission to Zaporizhzhia (ISAMZ). See IAEA, ['Update 97 – IAEA Director General Statement of Situation in Ukraine'](#) (3 September 2022).

⁴⁹ A continuous and reliable connection with an external source of power is necessary for the safe operation of a nuclear power plant even when it is no longer producing energy. This is for activities such as cooling and containing radiation. IAEA, ['Update 99 – IAEA Director General Statement on Situation in Ukraine'](#) (7 September 2022); see also Fredrik Dahl, ['IAEA Proposal for Ukraine Nuclear Safety and Security Protection Zone Wins Support as Talks Begin on Its Establishment'](#) (IAEA News, 22 September 2022).

⁵⁰ President Zelenskyy, ['Ukraine's 10-Point Peace Plan'](#), , above at n 15, Point 1.

⁵¹ Alexander Query, ['Ukrainian Energy Company on Russia's Attacks on Infrastructure: "No System in the World Has Faced the Same"'](#) (The Kyiv Independent, 3 December 2022).

⁵² Lisa Schlein, ['UN: Half of Ukraine's Energy Infrastructure Destroyed by Russian Attacks'](#) (Voice of America, 13 December 2022).

⁵³ Oleksiy Chernyshov, ['Fueling Ukraine's Fight Back Against Russia's Blackout Blitz'](#) (Atlantic Council, 29 November 2022).

across the country.⁵⁴ Russia's justification for these attacks is to reduce Ukraine's military capacity,⁵⁵ although President Putin has indicated that the reason is retaliation for an attack (most likely by Ukraine) on the Kerch bridge linking Crimea to Russia.⁵⁶

Another Options Paper in this series has discussed the issue of war reparations,⁵⁷ and it is not proposed to revisit this issue here, other than to note that on 14 November 2022 the UN General Assembly adopted a Resolution entitled 'Furtherance of Remedy and Reparation for Aggression Against Ukraine', which inter alia '[r]ecognizes that the Russian Federation must be held to account for any violations of international law in or against Ukraine ... and it must bear the consequences of all of its internationally wrongful acts, including making reparation for the injury, including any damage, caused by such acts'.⁵⁸ Infrastructure has constituted a discrete category of claims for war reparations in the past, for example in the Ethiopia-Eritrea Claims Commission.⁵⁹ In addition to reparations, a Ukraine-Russia peace agreement could cover commitments to cooperate in rebuilding energy infrastructure, especially for infrastructure traversing or supplying one or more autonomous regions.

A separate question, however, is whether the damage that Russia has caused specifically to Ukraine's energy infrastructure during the conflict constitutes a war crime. This is a question at present under investigation by the Independent International Commission of Inquiry on Ukraine, established by the UN Human Rights Council,⁶⁰ and the view that it is a war crime is widely supported by political figures beyond Ukraine itself. The US, the EU and Germany, for example, have called the attacks a 'war crime'.⁶¹

This raises two questions. The first is whether the infrastructure being targeted qualifies as a military objective, which is to say 'objects which by their nature, location, purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralisation, in the circumstances ruling at the time, offers a definite military advantage' (Additional Protocol I, [Art 52\(2\)](#)).⁶² An energy installation may be a legitimate military objective if it is used by Ukrainian forces for military purposes, including future military uses. This is the case even if the same installations are used, even significantly, for civilian purposes. However, the attacks would still need to offer a 'definite military advantage' to Russia (and a decrease in civilian morale does not count). Even if they did, such attacks would need to be

⁵⁴ Amnesty International, '[Ukraine: Devastating Power Cuts Undermining Civilian Life as Christmas Approaches](#)' (21 December 2022).

⁵⁵ Al Jazeera, '[Lavrov Defends Russian Attacks on Ukraine's Infrastructure](#)' (1 December 2022).

⁵⁶ Ukrayinska Pravda, '[Putin Explains Why He Is Destroying Ukrainian Energy System: It Is Revenge](#)' (Yahoo News, 8 December 2022).

⁵⁷ Anon, '[A Russia-Ukraine Claims Commissions After the Armed Conflict](#)' (2022).

⁵⁸ UNGA [Resolution A/ES-11/L.6](#) (adopted 14 November 2022), operative clause 2.

⁵⁹ Eritrea-Ethiopia Claims Commission, Final Award – Eritrea's Damage Claims (17 August 2009) RIAA Vol XXVI 505.

⁶⁰ A member of the Independent Commission stated that '[p]art of the analysis that we are engaged in at present ... is whether the attacks constitute war crimes.' See eg Emma Farges, '[UN Investigation Examining "Devastating" Attacks on Ukraine Infrastructure](#)' (Euro News, 3 December 2022).

⁶¹ For the US see eg Amanda Macias, '[Pentagon Says Moscow's Deliberate Targeting of Ukrainian Energy Grids Is A War Crime](#)' (CNBC, 16 November 2022); for the EU see eg Radio Free Europe/Radio Liberty, '[EU's Von Der Leyen Says Russian Attacks on Ukraine's Infrastructure Are War Crimes](#)' (19 October 2022); for Germany see eg Ayhan Simsek, '[Germany Says Russia's Attacks on Ukraine's Electricity Infrastructure Are "War Crimes"](#)' (Anadolu Agency, 29 November 2022). A G7 communique was more nuanced: 'We condemn these attacks in the strongest possible terms and recall that indiscriminate attacks on innocent civilian populations constitute a war crime': UK Prime Minister Office, '[G7's Leaders' Joint Statement on Ukraine](#)' (Press Release, 11 October 2022).

⁶² Michael N Schmitt, '[Ukraine's Symposium – Attacking Power Infrastructure Under International Humanitarian Law](#)' (Lieber Institute – West Point, 20 October 2022).

proportionate to that advantage. That depends on whether foreseeable⁶³ collateral damage (principally civilian deaths and illness) is excessive compared to the direct military advantage.⁶⁴

A second question is whether the attacks could amount to ‘[a]cts or threats of violence the primary purpose of which is to spread terror among the civilian population’, which are also prohibited.⁶⁵ Whether, factually, the attacks have the ‘primary purpose’ of terrorising the civilian population depends on a factual inquiry. It is not possible to give a definitive answer to this question here.

SETTLEMENT OPTIONS

Energy has been a key issue in the Russia-Ukraine conflict and will undoubtedly feature as a key aspect in any Russia-Ukraine peace settlement. This Option Paper has set out four different energy-related issues which may feature in a Russia-Ukraine peace agreement.

Firstly, a peace agreement may cover Ukraine’s energy security. Energy security is a major concern for Ukraine, both long-term, in the form of energy independence from Russia, and in the short-term, to be able to supply sufficient and affordable energy to Ukrainians. While Ukraine’s long-term energy self-sufficiency does not need to feature in a peace settlement, Ukraine’s short-term energy security probably will. In the short-term, similarly to Europe, Ukraine might still need to import energy resources and in particular gas from Russia, either directly or, most probably, indirectly (in the form of reverse-flow imports of energy originally from Russia) to be able to meet its energy needs. This need might also explain President Zelensky’s request in his 10-point peace plan that a price export restriction be imposed on Russian energy sources to protect Ukraine, Europe and, more generally, energy consumers worldwide. Whether in the form of an energy supply guarantee ([1979 Egypt-Israel Peace Treaty](#)) or of an export price guarantee ([2020 UK-EU Trade and Cooperation Agreement](#)), some obligations concerning Russian supply of energy to Ukraine could feature in a Russia-Ukraine peace agreement.

Secondly, and even more than energy security, a peace agreement will most likely cover the fate of the abundant energy resources located in Ukraine’s Russian-occupied territories (on the assumption that these remain occupied). These resources are crucial to Ukraine’s energy security. It is possible that a Russia-Ukraine peace agreement, as that advocated by President Zelensky in his 10-point peace plan, would provide for the withdrawal of the Russian troops from these territories and the restoration of Ukraine’s territorial integrity over them as well as the reaffirmation of Ukraine’s rights over the resources located there.⁶⁶ But assuming that this is not possible, and based on the alternative solutions considered by Weller’s ‘[Ukraine Settlement Options: Territory](#)’ paper, this paper describes various settlement options, including bypassing or deferring the question of ownership over the resources ([2005 Sudan-SPLM Comprehensive Peace Agreement](#)) and focusing instead on the issue of sole or joint management ([2005 Indonesia-Aceh MoU](#)) and revenue sharing ([2018 Philippines-Bangsamoro peace settlement](#); [2005 Indonesia-Aceh MoU](#)). The paper also presents a settlement option ([2022 Israel-Lebanon Maritime Delimitation Agreement](#)) in which management and revenue

⁶³ On the scope of the ‘foreseeability’ requirement, see Charlie Dunlap, ‘[Is Attacking the Electricity Infrastructure Used by Civilians Always A Crime?](#)’, (Lawfire Blog – Duke University, 27 October 2022), referring to Ian Henderson and Kate Reece, ‘Proportionality under International Humanitarian Law (IHL): The “Reasonable Military Commander” Standard and Reverberating Effects’ (2018) 51 Vanderbilt Journal of Transnational Law 835.

⁶⁴ Article [51\(5\)\(b\)](#) and repeated in Articles [57\(2\)\(a\)\(iii\)](#) and [57\(3\)](#) of Additional Protocol I.

⁶⁵ Article [51\(2\)](#) of Additional Protocol I.

⁶⁶ President Zelensky, ‘[Ukraine’s 10-Point Peace Plan](#)’, above at n 15, Points 5 and 6.

sharing are outsourced to a third-party private operator, which is suitable when, as in this case, there is a lack of trust between the parties.

Thirdly, a peace settlement will also most likely cover the fate of the Zaporizhzhia nuclear power plant, which has been uninterruptedly occupied and controlled by Russian forces since the beginning of the conflict, despite still being run by Ukrainian personnel. In an ideal scenario for Ukraine, a peace settlement would provide for the return of the plant to Ukraine's control and the restarting of electricity generation, given that this plant was responsible for 20% of Ukraine's electricity supply prior to the conflict. This scenario could also be acceptable to Russia if Ukraine, for example, agreed to share part of the electricity generated with one or more autonomous regions. However, given its strategic location in a region (Zaporizhzhia) illegally annexed by Russia in October, it might be easier for Russia and Ukraine to reach an agreement over the demilitarisation of the area around the plant and the establishment of a 'zone of nuclear safety and security' under the IAEA's control. This compromise solution, which features as Point 1 of President Zelenskyy's 10-point plan, has been persistently suggested by the IAEA to avoid the threat of nuclear accident or the risk of the plant being used as a radioactive bomb. The plant could also be placed under the IAEA's control ad interim, that is before its return to Ukraine.

Fourthly, a peace settlement will also most likely cover reparations for the damage to the energy infrastructure concertedly targeted by Russia since October and which amounts, at the time of writing (December 2022), to half of Ukraine's energy infrastructure. The paper refers to damaged infrastructure as a head of claim considered for war reparations by the [Eritrea-Ethiopia Claims Commission Final Award](#) (cf [2000 Eritrea-Ethiopia Peace Agreement](#)). The paper also considers options for cooperation between Russia and Ukraine in rebuilding the damaged energy infrastructure (especially if this is shared with one or more autonomous regions). Furthermore, the paper briefly considers the extent to which these concerted attacks may constitute a war crime and might not be justifiable under international humanitarian law but refers to [another paper](#) in this series in relation to the question of war reparations and the range of settlement options on this matter.