## Contents

3  
Note from the editor

4  
Environmental consequences of the Russian-Ukrainian war  
How war becomes a disaster not only for people, but for the environment as well.  
Oleksii Vasylkiv

16  
Nuclear Blackmail  
The war in Ukraine strains international nuclear safety systems  
Charles Digges

22  
War in Ukraine: the threat of world hunger and the reduction of the planet’s biodiversity  
How the special operation in Ukraine affects the global food crisis and causes further destruction of ecosystems  
Evgeny Simonov *

28  
War with Ukraine or fight against climate change?

30  
Degasification and de-petrolization: impact on the global energy balance  
How the sanctions imposed against Russia change the balance of international energy markets  
Vera Kuzmina

36  
How war affects grassroots environmental protest  
The environmental movement in Russia after February 24: concerns environmental activists have now and problems they face.  
Zinaida Palvinskaya

42  
"Litigation, investigations and prosecutions will continue many years after the bullets stop flying"  
Interview by Ksenia Vakhrusheva

48  
Felling in War Time  
How the economic consequences of the special operation affect forestry projects in Russia  
Fedor Bakholdin

---

* Evgeny Simonov – recognized by the Ministry of Justice of the Russian Federation as an individual acting as a media-foreign agent
Dear readers,

Our magazine has not been published since December 2021, and in March 2022 the Bellona Ecological Rights Centre ceased its activities in Russia. But the Bellona Foundation — an international environmental organization — will continue its informational and analytical work in the Russian language. The reasons for this are obvious. At the end of February, Russia launched a full-scale war on the territory of Ukraine. It was not clear to us, the staff and authors, how to continue speaking about environmental and climate issues without mentioning the military action in Ukraine — but doing so would have carried direct risks for our colleagues. Because of this, we have decided to pause our work on the territory of the Russian Federation.

Now we are ready to present to you a new issue of our magazine, which is dedicated to the environmental and climate consequences of this war. A group of authors and experts worked on the articles, some of them from within Russia and some in other countries. A number of articles are published under pen names to protect their authors from new Russian laws severely punishing anything resembling dissent.

The articles cover a wide range of topics, including an analysis of the direct environmental consequences of hostilities on the ecosystems of Ukraine (written by Ukrainian ecologists), the threats arising from military operations near nuclear power plants, and the indirect consequences of war for the environment and climate of the world, the global energy sector, and food market. Our authors also describe other goings-on in Russia in the field of climate and forest policy, as well and what has come of the grassroots environmental movement and protests.

We hope that the new issue of the magazine will be useful for you and that you share it with your family, friends, and colleagues. And as always, we welcome your feedback.
On the morning of February 24, 2022, the first cruise missiles flew in my city. Now I am a forced migrant and spend most of my time analyzing the impact of war on wildlife. This is important because there will be a question asked tomorrow: “What shall we do after the end of the war?” Answering that is possible only once two other questions are answered: “What has changed as a result of the war?” and “How exactly did it affect the environment?”

The environment loses in any war

Assessing the environmental consequences of war is an incredibly difficult task for a scientist or expert. In the past, my colleagues and I had to analyze the consequences of the invasion of Russian troops in the Donbass region and the environmental consequences of the annexation of the Crimean peninsula. Unfortunately, each case is unique and doesn’t lend itself to easy application to the current phase of the war. So, in 2015, after the liberation of a part of the temporarily occupied territory of the Donetsk region (in the area of the Holy Mountains National Park and the Cretaceous Flora Reserve), we had the opportunity to study various forms of forest damage, and to take samples from craters on the chalk mountains. The war in the east of Ukraine, which most actively developed in 2014-2016, took place mainly in natural areas and only partially in the fields. Even the conditional border with the self-proclaimed Donetsk and Luhansk People’s Republics almost completely passed through natural areas consisting of protected areas and river valleys.

Around Crimea, it is believed that there were no military actions, but this is not entirely true. Since 2015, Russia has concentrated an unprecedented amount of military contingent on the peninsula and conducted repeated military exercises involving a significant amount of equipment and mock amphibious assault operations. The zone for conducting such exercises was mainly the Kerch Peninsula, almost completely occupied by natural steppes.
The real area of the military training ground created there was about 55,000 hectares (together with the Opuk Nature Reserve). As a result of the exercises, this entire territory was destroyed by the chemical products of ammunition. International law interprets military exercises as a kind of military activity, so, if I speak correctly, Crimea really suffered greatly from military activities, and the coastal area, where most of the ammunition was fired, even more so. In simpler terms, for animals and plants and protected areas, it does not matter for what purpose tanks drive and shells explode. The destruction of natural landscapes and the death of all living things occur with the same inevitability.

But this war is completely different. It is divided into ground operations in the south and east of Ukraine and missile strikes against critical infrastructure in other regions.

The ground operation is mainly aimed at the complete destruction of settlements by artillery and mortar fire. The fields also suffer greatly – there is a massive planting of mines in the territory. And we’re talking about a fairly large area – about 1/5 of the territory of Ukraine. With rare exceptions, it can be argued that Russia is using scorched earth tactics. This makes a difference since this style of warfare involves the destruction of the entire industrial infrastructure, any warehouses and even sewage treatment facilities.

During the first four months of the war, up to 2,800 high-precision missiles were fired on the territory of Ukraine, many of which fell on territory controlled by Ukraine, from Kyiv to the Lviv region (15 km from the Polish border). Even missiles destroyed by air defense forces cause significant damage due to toxic fuel and the explosion itself. All this means that Russia’s war in Ukraine in 2022 intentionally or indirectly releases all possible pollutants into the environment, from the contents of sewage treatment facilities, goods and materials in warehouses to raw materials from chemical plants. Obviously, we are talking about an incredibly large-scale pollution of the environment (air, soil, surface and ground water, ecosystems), not comparable to any events of the past. Most pollution will spontaneously continue for a long time.

Finally, there has been mass migration of Ukraine’s population. Fifteen million Ukrainians were forced to leave their homes, and housing for 3-4 million of them is unlikely to be repaired. The infrastructure of cities is so damaged that it is easier to build new cities than to restore the destroyed ones. So entire cities have turned into piles of construction waste. Changes in the demographic situation will inevitably affect the nature conservation issues in many prosperous regions. Also, the nature of prosperous regions is already suffering from a compensatory increase in crop land caused by the temporary loss of 32% of all agricultural land in Ukraine that is now under occupation or being mined.

Under such conditions, none of us can obtain any quantitative information about the impact of hostilities on the environment. We will not be able to get them in the future either, because it would be foolish to imagine sampling pollution that went into rivers, air or soil a few months earlier. Therefore, it remains for us to analyze the available information and give qualitative assessments of the events taking place. Unfortunately, no one in Ukraine is heeding the warnings of environmental scientists so far, to say nothing of Russia, whose actions in Ukraine threaten the environment and Russia itself too. Incidentally, here it will be enough to recall the nuclear threat in order to stop doubting whether there is a threat or not.

It is worth distinguishing between threats, influences and consequences. Not all threats lead to real impacts. Influences, in turn, lead to changes in the environment – and only changes are the direct cause of consequences. For example, at the moment, fortunately, the threat of a nuclear catastrophe has not caused any tangible impacts. But at the same time, it remains the most worrying threat for many countries in Europe.
The inability to conduct quantitative studies, that is, to measure the consequences, forces us to restrict ourselves to a qualitative assessment of the effects. How and what changes in the environment as a result of hostilities?

In addition to the direct impact (destruction of landscapes, ecosystems, and pollution), military operations and occupation also have an indirect impact on the environment, which can manifest itself in regions far from the places of hostilities, and even in other countries:

- an increase in the scale of mining, forestry and the use of other natural resources in the countries participating in the war;
- an increase in extraction of natural resources (including energy resources) and agricultural development of land in countries for which imports were limited as a result of the war;
- Spontaneous use of natural resources as a result of falling living standards among residents of the occupied, affected regions, migrants and countries affected by export restrictions.

Spontaneous nature management is rapidly gaining momentum in the occupied and front-line territories, as the needs of the population in conditions of limited resources are rapidly increasing, and at the same time, any inspections or forestry services are no longer working. Similarly, the protection services of protected areas, which until recently limited access to nature management in nature reserves and national natural parks, have stopped working. So it is the protected areas that will probably feel the most significant changes as a result of the indirect impact of the war.

Let's return to the environmental component. Explosions lead to the simultaneous destruction of most living organisms that fall into the zone of the blast wave, as well as to fire and fragments dissemination. The action in this case is very short-term, but the destruction of the vegetation and soil cover then leads to the occurrence and spread of erosion and long-term degradation of the territory. Also, the destruction of the vegetation cover subsequently causes the spread of alien plant species that create “foci” in the damaged areas.

A large number of small organisms that create and maintain soil, as well as its biological cover – such as grasses, mosses, lichens and fungi – are most vulnerable to the influence of ammunition. In other words, all living organisms located in the thickness of the soil or protecting its surface from erosion are not able to protect themselves from negative influences (short-term destructive effect of the blast wave and long-term effects of chemical pollution).

As a result of the munition rupture partial chemical reactions occur, which lead to contamination of the soil and atmosphere. In addition to relatively safe CO2 and water vapor, in the process of oxidizing one kilogram of explosives, several dozen cubic meters of toxic gases enter the air: SO2, NOx, CO (including aromatic hydrocarbons, which are much more toxic than ordinary ones). From the atmosphere, sulfur and nitrogen oxides return to the soil through acid rains, which change the pH and cause burns in plants, as well as literally burning out soil fauna, algae, bacteria, grass seeds and roots, and hyphae of fungi that are in mycorrhiza with plants. The soil becomes the final link in the chemical destruction of ammunition.

Some of the metal fragments and unreacted substances remain in the ground; the rest scatter and settle around (fragments up to 300 m, unused reagents up to 35 m). Shards carry with them a considerable threat. More often, ammunition shells are made of cast iron alloy, to which, in addition to iron and carbon, sulfur and copper are added. Artillery shells of caliber 120 mm and 152 mm produce, respectively, 1600-2350 and 2700-3500 fragments weighing from one gram(!). I don't even dare to count their total surface. Thus, chemical elements from the surface of the fragments will be oxidized (including copper – a heavy metal, some compounds of which can be quite toxic), and enter the cycle of environmental substances where they are included in the trophic chains. In addition, some of the obsolete munitions used contain elements made with depleted uranium.

By applying the methodology for calculating the consequences of shelling for soils, developed by our colleagues from the international charitable organization “Environment – People – Law” for the east of Ukraine, we can draw disappointing conclusions. For example, another satellite image we were able to view shows a 1 sq. km, sown with winter crops. In it we counted 480 craters from 82 mm
**DIRECT IMPACT OF MILITARY ACTIVITIES**

<table>
<thead>
<tr>
<th>Destruction of ecosystems, natural and agricultural landscapes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• physical impact of ammunition (explosive wave, fire damage, fragments);</td>
</tr>
<tr>
<td>• passage of military machines;</td>
</tr>
<tr>
<td>• construction of defense structures;</td>
</tr>
<tr>
<td>• occurrence of fires in natural and agricultural areas;</td>
</tr>
<tr>
<td>• destruction of reservoir dams;</td>
</tr>
<tr>
<td>• felling of plantings (forests, parks, forest belts).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Creation of technogenic risks and environmental degradation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• nuclear terrorism (destruction of nuclear power facilities and other actions leading to the spread of radioactive material and the migration of contaminated items, personnel and equipment; damage to nuclear safety/energy facilities, which may lead to the release of a “dirty bomb” into the environment);</td>
</tr>
<tr>
<td>• conducting combat actions near other dangerous facilities;</td>
</tr>
<tr>
<td>• destruction of sewage treatment facilities and waste storage sites.</td>
</tr>
</tbody>
</table>

**Environmental pollution:**

- destruction of environmentally hazardous industries and fuel storage facilities;
- fires in warehouses with materials that are hazardous in combustion;
- chemical impact of munitions (including the use of prohibited types of weapons that pose risks to the environment – cluster, vacuum, phosphorus munitions, etc., as well as obsolete munitions with toxic fuel and other components, including uranium rods);
- burning of destroyed equipment, leakage of fuel and other pollutants into the environment, ingress of destroyed equipment into inland water bodies and marine areas;
- Leaving the bodies of fallen soldiers and civilians in natural areas/water areas and settlements.

---

**The first and most obvious of all the effects of warfare is the explosion of ammunition.**

Certainly, it is this factor that is now creating the greatest environmental consequences, since the scorched earth tactics used by the Russian troops involves the use of an incredible amount of ammunition. According to the General Staff of the Armed Forces of Ukraine, during the days of especially fierce battles, the armed forces of Ukraine spent 6-9 thousand shells using cannon, rocket artillery, mortars, tanks and drones.

At the same time, the Russian army used six times more ammunition. In addition, Russia has a large stockpile of cruise missiles and air bombs of various capacities, which are also actively used against the civilian population. It’s hard to believe that some 100,000 rounds a day are used, but looking at a satellite image of a small area of Ukrainian-controlled territory is enough to dispel such doubts.
while shelling, lack of fire equipment, rescuers and direct prohibitions of the occupying authorities. Russia's military actions in Ukraine in four months led to 37,867 fires in natural and man-made landscapes. In total, 1006.62 sq.km was burned. Fire destroyed 36,154 hectares of forests and 10,250 hectares of steppes. For this calculation, we used data on thermal anomalies provided by NASA. But we still consider the results obtained to be an underestimate since we cannot obtain an accurate contour of all fires. But the conclusions are already unpleasant. A third of all territories (11,216 hectares) that burned in Ukraine during the four months of the war are nature reserves and national parks. The greatest number of them suffered in the Donetsk, Kherson and Kyiv regions.

Contrary to media reports, deforestation did not become a mass phenomenon associated with the war. Such actions took place only in part of the construction of dugouts and indeed require a significant number of even trunks, mainly from pine crops. Less significant for biodiversity, but very dangerous in terms of increased wind erosion, is the massive felling of forest belts for tactical purposes and in the first months of the war to heat checkpoints. Also in the vicinity of settlements there was a spontaneous felling of tree plantations for heating and cooking in heavily affected areas. With the onset of the cold period, the population that has not left the occupied lands is likely to greatly increase the volume of spontaneous logging —however, this should not be considered a problem for biodiversity. Firstly, most of the trees in settlements and around them are represented by alien species, and secondly, such spontaneous cuttings will never even come close in scale to the forests burned down during the first months of the war.

In addition to the damage caused by weapons, the landscape and ecosystems are greatly affected by military equipment (we are talking primarily about heavy vehicles, often caliber shells, 547 craters from 120 mm caliber shells and 1025 from 152 mm caliber shells. Only on this square kilometer of field were found 50 tons of iron, 1 ton of sulfur compounds and 2.35 tons of copper that got into the soil. It is difficult to calculate the volume of heavy metals and other compounds, less in amount, but with much more dangerous effect. In addition, at least 90,000 tons of soil have been turned up by explosions, and even by leveling the funnels, we will no longer have even a meager fertile soil layer in these areas. By the way this means that 37% of the entire area has actually lost its fertile soil layer. It is difficult even to guess how much fuel is needed to restore the recently even surface of the field.

But still, we need to understand that the incredibly large variety of ammunition used makes it impossible to get a complete picture of pollution, or even its exact spectrum. For example, Russian troops have repeatedly used incendiary munitions containing phosphorus. This has been recorded in photos and videos, but, unfortunately, the lack of accurate marking of such munitions does not permit us to say whether these are phosphorus munitions that are prohibited by international law as a particularly dangerous chemical weapon or other kind of weapons containing phosphorus.

Regardless of whether incendiary ammunition is used or not, fires occur massively both in places of explosions, rocket and artillery shell launches, in places where military equipment hits, and in natural and agricultural areas. Like any other fire, fires in ecosystems lead to the destruction of biodiversity over large areas. If somewhere in the world there are people who are skeptical about the concept of “ecocide”, then in the case of fires, hardly anyone can object: not a single living organism in Europe is able to survive during a fire. And in the conditions of the climate of the steppe zone, the burnout, in particular, of forests will become their final destruction.

In the conditions of hostilities, fires occur more often (ignition from explosions, the operation of artillery systems and the burning of destroyed equipment, the use of incendiary ammunition) and last longer (the inability to extinguish on mined fields, while shelling, lack of fire equipment, rescuers and direct prohibitions of the occupying authorities). Russia's military actions in Ukraine in four months led to 37,867 fires in natural and man-made landscapes. In total, 1006.62 sq.km was burned. Fire destroyed 36,154 hectares of forests and 10,250 hectares of steppes. For this calculation, we used data on thermal anomalies provided by NASA. But we still consider the results obtained to be an underestimate since we cannot obtain an accurate contour of all fires. But the conclusions are already unpleasant. A third of all territories (11,216 hectares) that burned in Ukraine during the four months of the war are nature reserves and national parks. The greatest number of them suffered in the Donetsk, Kherson and Kyiv regions.

Contrary to media reports, deforestation did not become a mass phenomenon associated with the war. Such actions took place only in part of the construction of dugouts and indeed require a significant number of even trunks, mainly from pine crops. Less significant for biodiversity, but very dangerous in terms of increased wind erosion, is the massive felling of forest belts for tactical purposes and in the first months of the war to heat checkpoints. Also in the vicinity of settlements there was a spontaneous felling of tree plantations for heating and cooking in heavily affected areas. With the onset of the cold period, the population that has not left the occupied lands is likely to greatly increase the volume of spontaneous logging —however, this should not be considered a problem for biodiversity. Firstly, most of the trees in settlements and around them are represented by alien species, and secondly, such spontaneous cuttings will never even come close in scale to the forests burned down during the first months of the war.

In addition to the damage caused by weapons, the landscape and ecosystems are greatly affected by military equipment (we are talking primarily about heavy vehicles, often
with treads). To disguise them all, shelters for equipment were dug at each location. The construction of fortified areas, trenches, dugouts and shelters for equipment is accompanied by significant destruction of natural landscapes. In addition, the construction of dugouts requires a large amount of even wood. This means that armed forces cut down the necessary trees in large numbers, along the way destroying unsuitable ones that prevent them from approaching the “good” trunks. Roads for equipment are also being laid by driving heavy tanks right through the forests. Thus, the passage of equipment, the construction of shelters for it and personnel in total occupies vast areas of natural ecosystems. In most cases, these are either forests or steppe slopes, the destruction along which subsequently leads to the washout of dug rock to undisturbed areas and to erosion in general.

But in addition to the massive similar violations of ecosystems that occur and multiply daily along the entire front line, there were also two cases of significant changes in landscapes. We are talking about the destruction of two dams on the rivers in the Kyiv and Kharkov regions.

As a result of the shelling, a dam was destroyed in the village of Kozarovichi, Kyiv region, separating the Irpin River from the Kyiv reservoir, which has a much higher water level. In the past, after filling the reservoir, it was separated from the river by a dam, keeping the floodplain of the Irpin unflooded, but the river itself was cut off from the Dnieper, into which it used to flow. Subsequently, Irpin was pumped into the reservoir by pumps. But now the dam has been destroyed – and in a matter of days, the waters of the Kyiv reservoir filled the Irpin valley for tens of kilometers, creating a water surface of almost 3,000 hectares, absorbing the floodplain (both the natural and plowed part) and partially the adjacent villages. It is worth giving this event its due, since the appearance of such a water obstacle helped stop the advance of the 56th Guards Air Assault Regiment of the Russian army on Kyiv and saved the western outskirts of the city from possibly significant destruction.

But the war retreated from the north of Ukraine, leaving burnt forests, sinkholes and a reservoir expanded by 3,000 hectares. Now the discussion about how to deal with flooded lands will become more and more relevant. Landowners, as well as construction companies with views of the river valley, will of course support the restoration of the dam and the pumping of water – although it is not easy to imagine pumping out such a volume. Residents of the flooded village of Demidov also want to return the water level below the level of their yards and houses. But the objective reality will rather tend to leave everything as it is. Firstly, the flooded area continues to remain an important defensive line, much more powerful than the bed of a small river with a reclaimed floodplain. Secondly, a flooded floodplain has more advantages in terms of nature conservation: it cannot be plowed up and built up; all of it will turn from vegetable gardens and degraded meadows with ruderal vegetation into exclusively natural shallow-water biotopes. And there will be no need to worry about the disturbance factor for bird colonies in shallow water. But the fate of Irpin has not yet been finally decided.

For tactical purposes, on April 2, the dam of the Oskol reservoir on the Oskol River in the Kharkov region was also destroyed. Here everything turned out the other way around, as a result of which the reservoir was drained and its bottom was exposed (9000 ha, 355,500,000 cubic meters). The drained bottom of the reservoir ceased to be an important shallow-water ecosystem, and at the same time, the incomplete destruction of the dam did not restore the flow of the river. Unfortunately, the location of the reservoir in the temporarily occupied territory does not permit us to obtain information about the state of the river and the dry bottom of the reservoir. In the future, the situation with the operation of the reservoir will definitely need to be resolved, since the water supply of the entire Donbass directly depends on the operation of the reservoir, since it is provided by the Seversky Donets-Donbass canal, which is supported by this particular reservoir in summers. It is impossible to restore the destroyed cities of Donbass without restoring the operation of the reservoir. The industrial part of this region is several hundred of compactly located mining, chemical and heavy industries. Until recently, Donbass remained the center of Ukraine’s environmental pollution. Together with the infrastructure, all this
is completely destroyed. Will someone be able to restore hundreds of factories on the site of the ruins, and is it rational to do this in its former volume? Perhaps the restored Donbass will have a completely different concept.

Pollution

Let’s get back to pollution. In the context of hostilities, environmental pollution takes on a large number of different forms. In the conditions of the Russian-Ukrainian war, many cases of pollution also have signs of violating the rules of war and even environmental terrorism, since some shelling was carried out with the aim of degrading the environment.

First of all, we are talking about the destruction of factories. As a result of hostilities, the entire network of large metallurgy and chemical industry facilities, which were concentrated in the east of Ukraine, was completely destroyed. It was these factories that traditionally posed the greatest danger to the environment in the country and formed the image of one of the most polluted regions in Ukraine. At the same time, before its destruction, Azovstal managed to stop the processes in such a way that the damaged workshops did not pose a threat to the environment. There are statements in the press that the level of air pollution in eastern Ukraine has significantly decreased, and this is presented as a certain chance to restore this region after the war – and even make it better than it was before. In terms of emissions into the atmosphere, this, of course, looks plausible, but if we recall that all factories and plants had treatment facilities, storage facilities for waste that cannot be cleaned, warehouses for raw materials and products, it becomes clear: we are talking about a very polluted territory where shelling released much more waste than was allowed during the operation of these plants.

In addition to the pollution of rivers, which are sources of water supply for industrial, municipal companies and individual settlements, cases of cessation of water treatment have also become quite massive, since a large number of infrastructure facilities have been damaged, including sewage treatment facilities. Bombardments of cities and towns have led to dozens of breakdowns of pipelines and pumping stations, leaving hundreds of thousands of people without access to safe water.

There are also a large number of coal mines in the region, which have been flooded for several years. So in terms of soil pollution, and even more so ground and surface water, it is hardly possible to imagine a bright future for the region that has abandoned the dangerous industry. All pollution – both from plants, sewage treatment facilities, and mine waters that have come to the surface – will inevitably fall into the Sea of Azov, either through the Seversky Donets River or through the Kalmius River. In both cases, the polluted rivers will carry the waste to Europe’s freshest and shallowest sea. At the same time, one should not expect a rapid extinction of life in the sea. Pollutants will accumulate in it for a long time and gradually, therefore, the disappearance of rare species in the first place, and later of background ones, is unlikely to be rapid and noticeable. But the scary thing is that pollution of the sea is inevitable, since all of the above pollution will eventually get into it from the Donbass anyway.

Fuel

From the first days of their invasion, Russian forces began to deliberately destroy critical infrastructure, using both high-precision missiles and rocket artillery. This applies not only to Donbass, but to all regions of Ukraine. It can be argued that the purpose of this was to weaken the provision of Ukrainian cities with fuel, resources for restoration and to cause maximum economic damage. However, some cases recorded by us also indicate that the purpose of individual attacks was precisely the purposeful deterioration of the environmental situation in settlements. It is possible that such goals were partially pursued by large-scale fires in construction hypermarkets, since there is no military need to burn down a construction hypermarket.

Oil depots were among the first to suffer. In total, more than 60 oil depots, large gas stations and fuel tanks at airports were destroyed by missile strikes. The Lisichansk and Kremenchug oil refineries were also destroyed. Oil depots were also shelled on the territory of Russia, in the Belgorod, Kursk and Rostov regions,
although we cannot draw conclusions about such cases, since on the specific
dates of such explosions Ukraine was
not armed with weapons capable of
reaching objects on the territory of the
Russian Federation, and even more so
in Rostov region. However, in all cases
there were massive one-off emissions
of pollutants into the atmosphere.
The second affected group was
warehouses of flammable substances
and building hypermarkets. About 20
such hypermarkets were destroyed
within Ukraine, and all of them in the
occupied territory. More than 30 more
shellings targeted warehouses of
varnishes, paints and other flammable
substances, as well as warehouses in
ports.

In the first days of May, the Russian
army focused on the destruction of
storage facilities for agrochemicals. In
the Ternopil region, after the shelling,
a large amount of nitrogen fertilizers
dropped into the Ikva River and killed all life
therein. Shelling of storage facilities for
agrochemicals continued until July.

Rocket strikes also destroyed
several gas pipelines in Kharkiv,
Mykolaiv, Zaporozhye, Kyiv, Donetsk,
and Luhansk regions of Ukraine. On
March 21, in the city of Sumy, at the local
enterprise Sumykhimprom, rockets hit
tanks with ammonia, forming a zone of
destruction with a radius of up to 2.5
km, which can be compared with the
actual use of chemical weapons. On
April 5, an industrial tank with nitric acid
was blown up by rockets in the city of
Rubizhnoye. On May 9, Russian troops
blew up warehouses with ammonium
nitrate in the Kramatorsk region. Such
actions certainly lead to a significant
deterioration of the environment, so
they should be considered as acts of
environmental terrorism.

Ammunition explodes not only
on the battlefield. Explosions also
occur in warehouses and minefields.
In the first days of the war, Russian
troops attacked ammunition depots
on Ukrainian territory in an attempt
to deplete Ukrainian stockpiles of
weapons and prevent resistance.
Since June, the initiative passed to the
Armed Forces of Ukraine, and shelling
of Russian military warehouses in the
occupied territory began with the use
of high-precision weapons. Obviously,
the detonation of a large warehouse
of ammunition is no different for the
environment from their separate use
in various places. Such explosions
and the further spread of munitions
residues can also create acute and
chronic risks to human health and the
environment through the release of
toxic components of the munitions.

The same applies to the mining of
the territory. Here it is worth clarifying
that an area exceeding 1/5 of Ukraine
is potentially mined. In places of all
hostilities, unexploded ordnance
remains in the soil, there are many
specially placed mines, trip wires, etc.
everywhere. From March to July 2022,
154,830 pieces of explosive equipment
and 662 kg of explosives, including
2,055 aerial bombs, were defused on
the territory of Ukraine. The area of
63,782 ha was surveyed. It is predicted
that the complete demining of Ukraine
will take about 10 years.

During hostilities, no one cares
if any substances and objects
contaminate the environment.
Ammunition explodes, military
equipment collapses and burns along with fuel and ammunition. Damaged equipment also poses significant risks to the public, as, for example, remnants of surface-to-air missiles (SAMs) and other types of missiles containing highly toxic propellants can pose a health hazard, as can some vehicles, often containing a range of toxic materials (including asbestos, PCBs and battery acid sources, and phosphorus).

Considering that the entire northern front of the invasion fell on the Polesie region, the most swampy part of the country, and in 2022 most of the rivers had at least partial floods and early ice melting, Russian equipment drowned in swamps in many places or fell through near the lake or rivers. It is difficult to imagine extracting it from water bodies in such a swampy region. With a high probability, such equipment will remain in ecosystems forever, continuing to pollute the environment for a long time.

**Sea**

Finally, let’s take a look at the sea. It also has become a battlefield. Shells exploded in the sea, downed planes and helicopters fell there. Gas platforms burned. Also, as a result of hostilities, a large number of military and civilian ships were sunk. Despite the fact that the destruction of even such a large ship as the Moskva cruiser seems to be a “drop in the ocean”, such events have a huge impact on biodiversity. The noise and vibration impact of explosions of powerful rockets destroys a considerable number of living organisms in a large radius from the place of the explosion. Leaking of oil products into the sea leads to the formation of a slick on the surface of the water, which can cover many square kilometers of the area where a huge number of living organisms will die.

Cetaceans are at particular risk. Three species of dolphins live in the Black and Azov Seas, and two of them are endemic. In addition to these risks, a serious problem for dolphins is the complication of echolocation, with which they communicate. The specific frequencies used by dolphins coincide with the frequencies of submarines, and this makes quite big areas of the sea unsuitable for the life of these mammals. Indeed, the number of dolphins stranded in the Black Sea has greatly increased since the beginning of the war.

But the most devastating effect of war is on land biodiversity. There are at least 20 plant species and two animal species in the active war zone alone that are superendemic and live only here in the shelling zone and nowhere else in the world.
Today it is too early to tell what exactly the environment of Ukraine will be like after the liberation of the entire territory of the state from the invaders. The most significant effects of war on nature will be associated with long-term social, institutional and economic changes, and not the tactical aspects of hostilities.

Of course, the first thing that comes to mind is not social change, but pictures of war. Explosions of ammunition, broken equipment, fires and territories turned into a lunar landscape. Such impacts rapidly destroy the natural appearance of any ecosystem, annihilating most of the visually noticeable animals and plants. Some impacts will be extended over time. Now it is difficult to assess how nature will react to the mass of destroyed military equipment scattered across forests, fields, rivers and swamps. How much and what kind of pollutants will deliver thousands of pieces of broken equipment and explosive ammunition into the environment and how long this will last. It is impossible to calculate all of this in full. First of all, this is because it is impossible to take any samples during the hostilities themselves and accidents can happen in uncontrolled territories and in combat zones. The same applies to pollutants released into the environment as a result of the destruction by the military of industrial facilities and storage sites for various chemicals.

However, damaged areas may remain in an unexpectedly favorable state when no economic activity takes place within them, which will allow nature to recover. After all, nature has a very strong potential for restoration. Forests quite easily restore damaged ecosystems after fires, river floodplains cover sandy alluviums with vegetation after a large flood, and animals rapidly populate areas where people do not interfere them. The best example is the exclusion zone of the Chernobyl nuclear power plant, which 30 years ago was populated, and land was used for agriculture by collective farms, and now it is the wildest territory in Europe.

In the case of the environs of destroyed settlements or where it is difficult to clear land from mines for various reasons, after the end of the war, there will be a period that is really beneficial for nature without anthropogenic pressure. It will also apply to adjacent territories that have not been damaged, but have the potential to become “donors of biodiversity” for the destroyed places. Protected areas destroyed today may become tomorrow areas where there will be more restrictions on people than in any protected area. The longer a reckoning is delayed, the more difficult it will be to carry it out. Therefore, it will be easier to donate certain territories to nature than to spend time clearing these areas. Incidentally, in such areas, interest in logging will drop dramatically, because wood with a large number of splinters and bullets not only has no commercial value, but is also dangerous for woodworking and logging equipment. So the interest of transnational companies in Ukrainian wood from some regions will decrease. By the way, the loss of state interest in part of the forests and territories will lead to an increase in uncontrolled nature management by the local population.

The main factor that will cause the weakening of anthropogenic pressure is, of course, the resettlement of a large number of Ukrainians from one region to another. The unprecedented rapid pace of evacuation of people from the zone of occupation and hostilities removes most of the factors of anthropogenic pressure from the territory. Despite millions of human tragedies, this situation contributes to the restoration of populations of all species, the distribution of which was restrained by economic activity. Of course, this statement should not be taken as an announcement of a positive natural processes. First of all, aggressive alien species will spread in uninhabited areas, which are not wild and only crowd out native biodiversity. Take, for example, ragweed, Canadian goldenrod, Syrian milkwort: by the beginning of the war, a certain immunity of natural ecosystems prevented the spread of these dangerous species in the wild, and intensive agriculture did not allow them to occupy agricultural

### Reports from researchers from open sources confirmed the loss of military equipment as of August 25:

<table>
<thead>
<tr>
<th>Russia</th>
<th>Ukraine</th>
</tr>
</thead>
<tbody>
<tr>
<td>5322</td>
<td>1518</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Russia of which:</th>
<th>Ukraine of which:</th>
</tr>
</thead>
<tbody>
<tr>
<td>destroyed: 3453</td>
<td>damaged: 127</td>
</tr>
<tr>
<td>abandoned: 302</td>
<td>captured in battle by Ukrainian troops: 1440</td>
</tr>
<tr>
<td>by Russian troops: 36</td>
<td>damaged: 36</td>
</tr>
<tr>
<td>captured in battle by Russian troops: 605</td>
<td></td>
</tr>
</tbody>
</table>

https://www.oryxspioenkop.com/2022/02/attack-on-europe-documenting-equipment.html

https://www.oryxspioenkop.com/2022/02/attack-on-europe-documenting-ukrainian.html
areas. The cessation of agricultural production will mean the creation of colossal epicenters of the distribution of such invasive species. The area of such zones, objectively, can be much larger than the area of natural areas. Therefore, a decrease in the population and a weakening of the intensity of agriculture, industry and the anxiety factor will indeed lead to the overgrowth of the territories recently occupied by people, but this will not mean the restoration of natural ecosystems here, but rather will give impetus to an unprecedented spread of alien species. Mutilated and abandoned settlements and natural landscapes, disfigured by sinkholes and trenches, will form types of ecosystems atypical for Ukraine in recent decades, the further development of which we still know nothing about.

When predicting change, one should also think about where people move when they leave the war zone. No administrative territory in the world is ready to accept a large number of refugees. Usually we are speaking of more prosperous and safe regions, the increase in population of which leads to increased pressure on natural ecosystems (from water consumption to logging and cutting down trees for heating) and an increase in the use of natural resources. The general standard of living in prosperous regions is reduced due to the redistribution of resources, and, accordingly, social tensions arise. After the war, not everyone will return to restore the housing and infrastructure of the destroyed cities. Therefore, after the peak load on ecosystems caused by the rapid influx of migrants to prosperous regions, the restoration of the previous state of settlement will occur only in part. The fact of the influx

No one can guess how many and what kind of pollutants thousands of pieces of broken equipment and explosive ammunition will impart on the environment, and how long this will last.

Photo Credit: Jozef Venskovich/ Ministry of Defense of Ukraine / commons.wikimedia.org
of migrants will mean a long-term burden on the ecosystems of regions remote from hostilities, which means it will significantly increase the area of influence. This area will also increase due to the loss of agricultural territories in the occupied, mined or simply war-damaged regions, the lack of which will be compensated for by additional development of natural areas.

All of the above and many more nuances not mentioned in this article turn the prediction of changes in nature into a formula with a thousand unknowns. However, the direct destruction of natural ecosystems as a result of hostilities is only part of the problem. The destruction of housing and industrial facilities, in fact, on a quarter of the territory of Ukraine means future large-scale work to restore them. The support of Western states, together with the willingness of the Ukrainians themselves to restore the state even better than it was, for nature means only the beginning of difficulties. Will it be possible to restore the cities where they were without attracting new territories for this? What to do with millions of tons of fragments of concrete and brick? What to do with the garbage that the property of several million Ukrainians has turned into? And, finally, what will be left of the nature of Ukraine if sand, crushed stone, wood and cement (chalk) are extracted from it to restore a quarter of the state?

Of course, the identified problems do not exhaust all the destructive influence of Russian armed aggression on the nature of Ukraine (and other countries as well), and there are still unknown problems to be discovered, but they will have to be solved anyway. And the quality of life of future generations of Ukrainians will depend on whether they are resolved correctly and in a way that is friendly to nature.
When Russian troops swept into Ukraine last February, it was only a matter of time before the country’s nuclear infrastructure became hostage to the combat.

On the first day of their invasion, Moscow’s soldiers took over Chernobyl, site of the world’s most notorious nuclear accident, and dug in positions within the irradiated exclusion zone. Days later, as they advanced from the east, they shelled a research reactor in the eastern city of Kharkiv.

Chernobyl was later abandoned amid unconfirmed reports of radiation sickness among the soldiers. But by then, the message was clear: In this, the world’s first major conflict in a country with active nuclear power plants, a major radiation accident could become a weapon of war.

Now intense fighting has coalesced around the Zaporizhzhia nuclear plant, Europe’s largest such facility, putting huge swathes of the continent at risk.

Nuclear Blackmail

The war in Ukraine strains international nuclear safety systems

CHARLES DIGGES
of a radiation accident – and the rest of the world on edge.

The Zaporizhzhia complex – a sprawl of cooling towers, six nuclear reactors, machine rooms and radioactive waste storage sites – produced 20 percent of the electricity used in Ukraine prior to the outbreak of war.

Located in the southeastern town of Enerhodar, it lies on the east bank of the Dnieper River and was captured by Moscow’s troops in the early days of their invasion. Still operated by Ukrainian technicians who are essentially held at their posts at gunpoint, the plant has fueled growing international anxiety as it becomes the focus of intensive and repeated shelling, with ordinance hitting alarmingly close to its most delicate, and dangerous, components.

The plant itself is overrun by Russian troops, with some 500 soldiers living on the premises of the complex and in Enerhodar. These soldiers have planted mines along the reservoir that feeds water into reactors and pools cooling spent nuclear fuel. Heavy weaponry like missiles and rocket launchers has also been moved into the confines of the plant, according to satellite imagery, Ukrainian officials, and cell phone photos smuggled out by staff.

An international mission to the plant, sent by the United Nations in September after weeks of painstaking negotiation with both sides of the conflict, confirmed damage to several critical structures – including fresh and spent nuclear fuel storage sites.

Though no radiation has been released yet, Rafael Grossi, the head of the International Atomic Energy Agency who led the mission to the complex, warned – once again – that continued fighting around the plant “may lead to radiological consequences with great safety significance.”

But the mission accomplished little other than to confirm what nuclear power experts have been saying since the occupation began – the only way to eliminate the risk of a serious nuclear accident is for Moscow to agree to a demilitarized safety zone around the plant. In the days following the IAEA plea, however, shelling around the plant has only intensified.

A new kind of nuclear weapon

For the first time ever, a nuclear power plant has been deliberately turned into a potential dirty bomb, and Russia is using it to intimidate not only Kyiv but the rest of Europe as well.

Russian troops are using a civilian facility strategically as a shield for troops on the bet that Ukrainian troops won’t dare fire upon it for fear of releasing a cloud of radiation. At times, however, it’s seems that Russia is using the plant as an auxiliary to its traditional nuclear arsenal.

Since the beginning of the invasion in February, Vladimir Putin has invoked the potential for nuclear escalation, even as some of his aides have later walked back such threats. Early in the war, the Russian leader issued a series of veiled threats, at one point televising a meeting where he ordered his aides to put the country’s nuclear forces on alert. There is no evidence that they actually did so, but the threat – meant to intimidate Ukraine and warn Western nations to stay out of the conflict – was unmistakable.

Now it would appear that Russia is using the threat of disaster at the vast nuclear complex on the Dnieper River for similar purposes. The result is that the situation at Zaporizhzhia is not only fanning fears of a new nuclear disaster, but is also coming to characterize a new kind of nuclear threat.

“The idea that a nuclear power plant would be caught in a conflict is something we have thought about a lot before, and it’s why the plants were designed to withstand attack,” Gary Samore, who was the lead nuclear adviser on the National Security Council to Presidents Clinton and Obama, told The New York Times. “But the idea that a plant would be used as a shield for forces occupying a plant, or that someone like Putin would use the risk of attacks or accident as a form of intimidation – I don’t think that was something we fully contemplated.”

As if to underscore the plant’s potential as a weapon, Russia’s defense ministry in mid-August released a map of where radioactive contamination might reach in the event of a catastrophic accident at Zaporizhzhia. It showed fallout focusing heavily on Germany, Poland, and Scandinavia – parts of Europe that have been especially supportive of Ukraine.

As shelling around the complex continues, even in the wake of the IAEA visit to the facility, Ukrainian officials have called on residents who lived near the plant to evacuate. Since early this summer, officials have been distributing anti-radiation potassium iodide pills to the tens of thousands of Ukrainians who live within 50 kilometers of the plant.

A symbol of Ukrainian independence

Of Enerhodar’s 55,000 residents some 11,000 worked at the Zaporizhzhia plant before the Russian invasion began. That number has dwindled significantly with the exodus of residents seeking safer ground. But hundreds of workers who initially fled or were otherwise scrambled by the invasion have returned to take up their posts at the plant, despite the torment of working under the threat of Russian guns.

“The staff came back to maintain control because the security of Ukraine is at stake and that of the whole

Zaporizhzhia NPP

20% of electricity production in Ukraine

50% of annual production from NPPs in Ukraine
European continent and the world,” one nuclear technician, who asked his name not be used for fear of reprisals, told Reuters.

The construction of Zaporizhzhia began in 1984 while Ukraine was still a Soviet republic. When its sixth VVER (the Russian acronym for water-water energetic reactor, the analog of the foreign pressurized water reactor, or PWR) came online in 1995, four years after the collapse of the Soviet Union and Ukraine’s independence, Ukrainians celebrated Zaporizhzhia as an accomplishment.

The plant became both a source of pride and a symbol of Ukrainian perseverance in the impoverished, early post-Soviet years and the aftermath of the 1986 Chernobyl nuclear disaster.

After Chernobyl, and after Ukraine’s independence, the authorities issued a brief moratorium on nuclear construction, but it was not long before the country forged ahead with its nuclear ambitions. Today, Ukraine runs 15 nuclear reactors spread across four plants and is second only to France in relying on nuclear power to meet its electricity needs.

But the memory of the Chernobyl is still potent in the Ukrainian conscience. The explosion forced the evacuation of 200,000 people and left 240,000 square kilometers of land uninhabitable. Its effects on health, the environment and the economy were unparalleled.

The main dangers to the plant

Yet though the world’s imagination has been captured – and terrorized – by the threat of a second Chernobyl erupting on the Ukrainian front, there are several differences between Zaporizhzhia and its afflicted older cousin that are if not comforting, then at least slightly encouraging.

Chief among those is that Zaporizhzhia’s reactors are of more modern design that uses water as a moderator instead of the graphite moderators that were used in Chernobyl’s flawed RBMK reactor design. Eight such reactors are still operating within Russia itself after sluggishly undergoing safety upgrades in Chernobyl’s wake.

Zaporizhzhia’s reactors are also highly fortified. Unlike the Chernobyl reactors, Zaporizhzhia’s six units are enclosed in pressurized steel vessels, which in turn are housed inside massive reinforced-concrete containment structures.

The reactors also have multiple safety backup systems, Michael Bluck, the director for the Center for Nuclear Engineering at Imperial College London, told Nature magazine. He said it would be very alarming if Russian forces deliberately tried to breach a containment structure, but that catastrophic damage from an accidental hit is unlikely.
“If a missile goes astray, I’m less worried about that,” he said. “These are very robust structures.”

Spent fuel ponds

But if something as dramatic as a Chernobyl-scale reactor explosion is unlikely, other threats lurk within Zaporizhzhia’s spent nuclear fuel ponds.

Like other nuclear power plants, Zaporizhzhia has numerous pool-like structures full of water where spent nuclear fuel is placed to cool off after it is withdrawn from the reactors. Damage to one of these six pools, whether accidental or intentional, could cause irradiated water to leak out or even boil off. In such circumstances, the fuel rods would be exposed to the open air, causing them to overheat and possibly melt.

Although an artillery strike on one of these is unlikely to spark a Chernobyl-level event, such a fire would nonetheless be very hazardous to people in the vicinity of the plant – and possibly further afield – as dangerous radionuclides became airborne.

One factor that may work in favor of the Ukrainians who live around the plant is that any fuel rods that have been in the pools for several weeks are less dangerous than when they were loaded into reactors. That’s because the main cancer-causing isotope – iodine 131 – decays quickly. The report that the IAEA presented after its safety mission to Zaporizhzhia made no special note of damage to any of the spent fuel pools.

The critical necessity of outside Power

Of all the dangers facing the plant detailed in the IAEA’s 52-page report, loss of outside power is the gravest.

A stable electricity supply is essential for any nuclear power plant to maintain cooling systems for the radioactive fuel in its reactors, and Zaporizhzhia is no exception. But it is this need that has been most consistently put under threat by the war.

During five weeks in August and September, shelling twice severed powerlines and isolated the complex from external power, leaving the cooling of reactor cores and spent nuclear fuel ponds to backup power sources of only limited resources.

When the complex was again deprived of outside electricity sources in early September, Ukrainian technicians were forced to take the technically precarious step of powering cooling and safety systems via what was then the plant’s single operating reactor. Such a work-around is outlined in technical document for plant workers, but it had never been tried for more than a few hours.

However, as of September 12th, that tenuous situation had dragged on for days. On that date, Ukrainian technicians were finally able to reestablish a single powerline to connect the plant to outside power.

Energoatom, Ukraine’s national nuclear operator, subsequently announced it was powering down that last reactor and bringing it into cold shutdown alongside the plant’s five other units, which have been cycled down and taken off the grid over the past several months of the invasion.

This measure, which had been urged on Energoatom by the IAEA and the Biden Administration, will leave the reactors in a safer state than when they were operating. While a direct military strike on their cores could still trigger a radiation accident, the effects would be greatly reduced if they are not producing power.

But the reactors are far from out of the woods. Energoatom’s statement noted that the risk of further damage to the powerlines “remains high” and that if the plant were forced to rely on its 20 diesel backup generators to perform vital cooling functions, the length of time they could run “is limited by the technological resource and the amount of available diesel fuel.”

According to Energoatom’s head, Petro Kotin, the generators can only power cooling and safety systems for about 10 days.

That’s a thin line of defense for six idled reactors that are still loaded with nuclear fuel. But if shelling again imperils power lines, those generators will be the plant’s only hope of keeping the reactor cores cool.

Keeping idle reactors cool

Under normal operations, uranium nuclei in fuel rods undergo fission, or break up, leaving behind nuclei of lighter elements. These isotopes accumulate during the lifetime of the rods, and many of them are highly radioactive, continuing to produce heat even after the reactor is shut down.

This means that the core of a reactor that has just been shut down must be actively cooled, which requires power to keep water circulating around the core – and that power normally comes from the grid.

“You have to remove the decay heat,” Imperial College’s Bluck says. “If you don’t cool it until it’s gone, then the core will overheat.” If the reactors’ active cooling suddenly stopped, Zaporizhzhia could face a scenario analogous to what happened at the Fukushima Daiichi Nuclear Power Plant in Japan, when power was cut off in the by the March 11, 2011 earthquake and tsunami. Within days, three of the reactors melted down.

“If the power goes off, we’re then reliant on fairly elderly diesel generators to run the safety systems,” Hamish de Bretton-Gordon, an expert in chemical, biological, radiological and nuclear weapons, told CBS News. “Once you lose the main power supply, you’re almost in a two-engine airplane which loses one engine, and then you’re in a bad position.”

He added that “for a nuclear power station in the US or UK to have to go on emergency power might happen once or twice in a decade. So when you’ve got it happening once or twice a week ... the chances of further problems increase exponentially.”

What is the plant’s future?

Amid the chaos of the invasion and the deliberately stoked fears of disaster, many experts in Ukraine and the West say they have detected a method to the madness. Russia’s goal, they say,
is to disconnect the Zaporizhzhia plant from the Ukrainian grid altogether and reroute its 6.7 gigawatts of power to Russia.

“What Russia is trying to do is the utility equivalent of annexation,” Suriya Jayanti, former energy head at the US Embassy in Kyiv, told the Wall Street Journal.

She said the expropriation of such a large supply of cheap and reliable power would upend energy markets, leaving Ukraine dependent on the European Union, where electricity prices have hit record highs for months. “Russia stealing a nuclear-power plant is a problem for Europe,” she said.

Energoatom’s Kotin told the Associated Press that the Russians “have a crazy idea to switch the ZNPP to the Russian power system; in fact they are trying to steal the Zaporizhzhia Nuclear Power Plant of Ukraine and steal all the electricity it produces.”

He added in an interview on Ukrainian television that Rosatom staff were initiating a “special procedure that will allow them to reconnect the plant’s electricity to Crimea,” through substations in territories occupied by Russian forces.

Several Zaporizhzhia employees backed that up in interviews with The Wall Street Journal, saying that Rosatom technicians at the plant have openly discussed rerouting electricity to territories occupied by Russia and eventually back into Russia. Senior Russian officials, including deputy prime minister Marat Khusnullin, have publicly pledged to integrate Zaporizhzhia with Russia’s energy system, or force Ukraine to pay for the electricity.

This line of thought was further developed during an early August meeting of Russia’s Federation Council, which ruled out ever returning the plant to Ukrainian control.

“The only way to ensure safety at a nuclear-power plant is one hundred percent control over its activities,” said Konstantin Kosachev, vice speaker of the council, in remarks reported by Interfax. Asked whether it would be possible to return the plant to Ukraine, he said: “No, and again no.”

Yet, for its part, Rosatom – which would presumably be responsible for operating the plant should the Russians win – denies that it has any plans to take control of the plant and reroute its output to the Russian grid, writing in a statement to The Journal: “We categorically and unequivocally deny these allegations. They are completely untrue.”

But on October 5, after “referendums” were conducted in a number of Russian-occupied territories, including the Zaporizhzhia region, that supposedly now make them part of Russia, Putin signed an order transferring the Zaporizhzhia complex to the control of a daughter structure of Rosatom. Therefore, it’s possible that an attempt will be made to integrate the plant into the electrical networks of the seized territories and the unification of those networks with Russia.

Indeed, what might prevent Russia from carrying out this massive rewiring project are the conditions of the war itself. The more than ten thousand-strong force of Ukrainians that manned the plant before the outbreak of war has dwindled and will be hard to replace. Now that the plant has fully entered a cold shutdown – which requires far fewer personnel – that brain-drain will likely intensify.

In those circumstances, it’s doubtful that Rosatom would be able to recruit several thousand skilled nuclear technicians from among its ranks to man a nuclear power plant located on an active front. Further, Russia would have to build the infrastructure necessary to reroute Zaporizhzhia’s output to occupied territories and Russia itself all amid the fog of a grinding war.

Is there a hope of keeping reactors safe in war?

By mid-September, days after completing its mission to the plant, the IAEA’s 26-member board of governors adopted a resolution...
demanding Russia end its occupation of Zaporizhzhia.

The agency “deplores” Russia’s “persistent violent actions against nuclear facilities in Ukraine,” and “calls upon” Russia to “immediately cease all actions against, and at, the Zaporizhzhia nuclear power plant.” It further demanded the plant be returned to the “full control” of “competent Ukrainian authorities.”

The agency’s plea represented a rare departure from the more neutral tone the UN agency usually employs by putting the blame for the danger to the plant squarely on the Russian side.

To most observers, however, that’s akin to stating the obvious. But assignment of blame coming from a body as hamstrung in its authority as the IAEA is a remarkable rhetorical development.

Created in 1957 as an arm of the UN, the agency’s primary job is to verify that nuclear material intended for civilian use does not get diverted to weapons programs. It further has the authority to raise alarm if it sees evidence of diversion, and to help train workers about safety protocols. But it has no mandate to deal with the current threat at Zaporizhzhia.

The agency cannot order the creation of a demilitarized zone around the plant, or an end to shelling. It does not have the expertise or intelligence units to come to a determination over whose forces are responsible for the attacks. But in these circumstances, clearly casting the Russian side as the one stoking the conflict at the plant is farther than many expected the agency to go.

Still, in practical terms, that doesn’t mean much. Russian diplomats to the agency again blamed Ukraine for shelling the plant and repeated their resolve to keep it under their control.

Ultimately, the world needs better agreements and treaties surrounding the status of nuclear facilities in conflict. For example, a 1977 amendment to a protocol of the Geneva Conventions forbids attacks on civilian nuclear power plants and other infrastructure, but the Russians withdrew from that part of the agreement in 2019.

Another scenario would be widespread adoption of the treaty between India and Pakistan, who have agreed not to attack one another’s nuclear facilities and even clarify annually which facilities are to be avoided.

The war in Ukraine has shown the necessity of adopting wider international agreements defending operational civilian reactors and civilian nuclear infrastructure, which are under the control of the IAEA, against military attack. Until then, nuclear power plants in combat zones risk becoming a new kind of nuclear weapon.
War in Ukraine: the threat of world hunger and the reduction of the planet's biodiversity

How the special operation in Ukraine affects the global food crisis and causes further destruction of ecosystems

EVGENY SIMONOV *
UWEC WORK GROUP

Since February, the world has watched in horror as Russia’s special operation in Ukraine creates and exacerbates a food crisis, preventing ready-to-sell agricultural products from being sold on world markets. We also see how the food crisis causes the destruction of natural ecosystems. The first agreement that the parties of the conflict managed to reach concerns specifically the transportation of grain from Ukraine to world markets and the removal of barriers that impede trade of Russian agricultural products and fertilizers. How can this affect the situation in the world and will the solution to the food problem be guaranteed?

The war exacerbated the global food crisis

The Russian invasion of Ukraine reduced agricultural production and largely blocked Ukrainian food exports. The international backlash against Putin’s crime has also complicated exports from Russia and Belarus as international sanctions have been imposed on banks, companies and individuals in those countries.

Meanwhile, according to the 2022 Global Report on Food Crises, in 2021 Ukraine and Russia accounted for a significant share of global exports of wheat (33%), barley (27%), corn (17%), sunflower seeds (24%), and sunflower oil (73%) (IFPRI, February 2022). The Russian Federation is the world’s largest exporter of nitrogen fertilizers and the third largest exporter of phosphate fertilizers (GRFC2022). Russia and Belarus together control 40% of the world’s potash supplies.

The decline in exports exacerbated the problems caused by the already sharp increase in global food prices, which hit an all-time high at the end of 2021. At this point, Russia imposed

Countries Restricting Trade of Certain Basic Foods, May 2022


* Evgeny Simonov – recognized by the Ministry of Justice of the Russian Federation as an individual acting as a media-foreign agent.
temporary restrictions on the export of grains, vegetable oils, sugar and certain fertilizers, which pushed up prices.

The global crisis has further intensified as other exporting countries, including India and Indonesia, have restricted the export of wheat, vegetable oils and other food products to protect their populations from malnutrition and price spikes.

In 2021, 36 of the 53 food insecure countries and territories in the world depended on exports from Ukraine and Russia for more than 10% of their total wheat imports, including 21 countries battling a major food crisis (e.g. Yemen, Sudan, Nigeria and Ethiopia).

A region like East Africa receives 90% of its wheat imports from Russia (72%) and Ukraine (18%) (GRFC2022).

In April 2022, the UN Secretary-General’s “Global Energy, Food and Finance Crisis Response Team” released its first report, which clearly demonstrated that it is the global rise in food prices that poses the greatest danger to the poorest segments of the world’s population, since they spend half of their income on food.

In May 2022, UN World Food Program officials feared that the decline in food exports exacerbated by the war in Ukraine would lead to an increase in the number of undernourished people, from 8 to 13 million people in 2022 and 2023. This organization gets 50% of its wheat from Ukraine and Russia, which helps feed 125 million people around the world.

In August 2022, the UN reported that the number of people experiencing acute food risks had reached 345 million, an increase of 47 million from the original figure, and all this is a consequence of the problems that have arisen in connection with the war in Ukraine.

**First wartime agreement**

With the mediation of Turkey and the UN, on 22 July 2022 in Istanbul, Ukraine and Russia signed a series of documents known as the “Black Sea Grain Initiative”. The “initiative” makes it possible to safeguard from war atrocities ships with agricultural products coming from three Ukrainian ports. The document provides for “the procedure for the passage of ships, their inspection, monitoring the functioning of the humanitarian corridor, the modality of demining and preventing dangerous incidents by a special Joint Coordination Center (JCC) in Istanbul with the participation of representatives of Russia, Ukraine and Turkey with the involvement of UN staff.” The “Initiative” defines an order for ships coming from Greater Odessa to the Bosphorus, guarantees of safety for them and procedures for their inspection by JCC employees.

Commercial ships must register with the JCC, which publishes detailed information about each transport, ports of destination, products carried and their volume, date of inspection, etc. The agreement is valid for 120 days and can be extended by agreement of the parties.

During the first month of the JCC Initiative, more than one hundred departures with different consignments of food cargoes to different ports of destination were registered. In total, they loaded on board 2.4 million tons of grain and other vegetable products.

According to documentation from the Ministry of Infrastructure of Ukraine dated September 9, 54 ships with a million tons of agricultural products went to Asia, 32 ships with 850 thousand tons went to Europe and 16 ships with 470 thousand tons of cargo went to African countries.

It is important to remember that the agreement itself provides for free trade without regulating destination regions in any way, and a significant part of the ships that were already in Ukraine at the beginning of the war were chartered by specific customers from specific countries. Thus, dozens of ships carrying feed corn to developed countries were loaded at the beginning of the war and waited for many months to be sent.

Simultaneously with the Black Sea Grain Initiative, the UN and Russia signed a “Memorandum of Understanding between the Russian Federation and the UN Secretariat on Facilitating the Promotion of Russian Food and Fertilizers to World Markets”. Russia is the world’s largest exporter of grains and fertilizers and is experiencing difficulties with transportation and financial transactions due to sanctions and the changed attitude of counterparties during wartime. The memorandum is valid for three years, during which the UN should facilitate Russian agricultural trade. Russia and the UN consider this agreement as important for providing the world with food as the unblocking of Ukrainian ports. Rebeca Greenspan, Secretary General of the United Nations Conference on Trade and Development (UNCTAD), is responsible for the implementation of the memorandum from the UN.
"Black Sea Grain Initiative" and famine

It is still difficult to say how the Initiative will help starving countries, because at the moment it has supplied only 3% of the grain transported to the needs of UN programs, and only half a million tons of grain went to the "countries of starving Africa".

Indeed, in order for the grain to go to starving regions, some sponsor must pay. In recent weeks, the United States and Sweden have allocated new funds for the purchase of Ukrainian grain for UN programs. In total, according to the Ministry of Infrastructure of Ukraine, 280 thousand tons of grain will be exported to the needs of the UN World Food Program in the near future.

That is, even if Russia does not join these humanitarian actions, the "Initiative" will still have a significant effect on a number of starving countries (including Ethiopia, Somalia, Yemen, etc.).

But a much greater effect is expected from the stabilization of food markets and lower prices for basic agricultural products. The Black Sea Grain Initiative is an important mechanism that marks the transition from chaos to the creation of anti-crisis mechanisms, which contributes to changing the behavior of market participants. So both the total amount of food exported and the Initiative itself as a symbol of stabilization that is understandable to everyone is important. If the "Initiative" is not extended, then this will give the world a signal of a return to chaos and may cause prices to rise and markets to destabilize. But big food exporters will earn even more.

The UN Food and Agriculture Organization (FAO) price index shows that by August 2022 they have fallen significantly, but are well above the pre-pandemic level and 5-10% above the pre-war level.

According to the FAO, the world expects a good wheat harvest, similar to the 2021 crop – 777 million tons. From the main producing regions, a significant drop is observed only in the European Union, but is offset by growth in Canada, the United States and Russia. Perhaps that is why a significant part of the ships from Ukraine went to European countries. As food prices fall, the cost of chartering ships to transport food is also gradually decreasing. UNCTAD has published very informative charts on the impact of food and shipping prices on countries of various incomes, showing that low-income countries are the least dependent on the transport of grain by ships and the most on food prices, since they mainly buy already processed grain.

All this confirms the thesis of the UN Secretary General that the Black Sea Grain Initiative is of a paramount importance as one of the measures to reduce world food prices, and has a great beneficial role for the poorest countries.

There is another important threat that could potentially be mitigated by the beneficial effects of Ukraine’s resumption of grain exports. This is a threat to the destruction of wildlife. After all, the direct consumption of wild plants and animals by humans and agricultural production are two key factors in the reduction of biodiversity on the planet.

At a time when countries are forced to respond to wars and food crises, their leaders often seek to alleviate these pressures by developing key biodiversity hotspots and valuable habitats on which the well-being of endangered species depends.

For example, in March 2022, the government of Ukraine simplified the rules for short-term leases of agricultural land that is not currently plowed to make it easier for agricultural workers evacuated from war zones to other parts of the country to produce food.

According to the Ukrainian Nature Conservation Group (UNCG), the move is putting pressure on natural steppes and grasslands, one of the world’s most endangered ecosystems, already severely damaged by the
indiscriminate expansion of arable land during the Soviet Union's planned socialist economy. In May 2022, the Verkhovna Rada of Ukraine adopted the Law "On the Peculiarities of Land Relations under Martial Law" (No. 2211-IX), which encourages the resumption of exploitation of natural meadows and steppes, including those located in protected areas. The new law conflicts with several older pieces of legislation, and definitively seeks to open up non-agricultural land for plowing. Considering that Ukraine has the capacity to produce 85 million metric tons of grain per year, most of which is exported, another 1-2 million tons of grain obtained through additional land development adds little to the gross harvest and, therefore, does not contribute to food production security or economic prosperity of Ukraine. On the other hand, the development of the last remaining unplowed natural pastures can lead to large losses of biodiversity.

Russia's agricultural sector was booming long before the invasion of Ukraine this year. It boasted an all-time record grain harvest in 2021 and steady but modest annual increase in arable land. The food trade, which is not subject to Western sanctions, may be the most lucrative export Russia can still count on. To fill the gap in the grain market left by the blockade of Ukraine, Russia expects to harvest a record 130 million tons of grain in 2022.

As a result, the expansion of arable land in Russia this year may go even faster. In April, President Putin sought to accelerate the re-use of arable land abandoned by Soviet-era collective farms, while the United Russia electoral bloc lobbied the Duma for state funding to reclaim 13 million hectares over three years. As a result, by the end of this year, arable land will grow by at least 1 million hectares. In this process, the remaining untouched natural grasslands can be involved first of all — due to the relative ease of their involvement in circulation, while the clearing of old fields overgrown with secondary forest requires large investments.

All Russian and Ukrainian ecologists – specialists in the protection of the steppes agree on the onset of the most likely negative consequences. Many species of birds, mammals, reptiles and invertebrates living in natural pastures will be displaced by reclamation of arable land in Ukraine and Russia. The steppe eagle, harrier, red-footed falcon, little bustard, steppe marmot, spotted ground squirrel, steppe viper and several species of crickets found in western Russia are species of particular concern to biologists. These are just some examples. Restoring the endangered saiga population in the Trans-Volga region will not be possible if at least some of the 900,000 hectares of now fallow land on which this species depends are returned to circulation.

For example, in the Kurilovskaya steppe (Saratov region, Russia) again plow up long-abandoned deposits with natural steppe vegetation.

**Food as a weapon**

Today we are witnessing the negative impact of the global crisis on environmental conservation programs around the world. Several other grain-producing regions have attempted to take steps to open up natural areas of high conservation value to agriculture and mining.

On March 23 this year, the European Commission held an extraordinary meeting to approve subsidies to farmers and allow Member States not only to reclaim fallows previously intended to protect biodiversity, but also to treat these lands with...
pesticides. This attempt, which is a step backwards for the EU Green Deal, was undertaken by France, the current EU Presidency. The EU farmers’ union Copa-Cogeca has also opposed the EU’s “Farm to Table” policy, stating that ‘since the Russian government is using food security as a weapon, we must counter it with a food shield’.

Many environmental NGOs criticized the move and insisted that the Green Deal could be a cure rather than an obstacle to food and energy security. Meanwhile, scientists argue that instead of plowing up fallow land, the EU should abolish the use of biofuels, the production of which consumes 9% of the world’s crops. The full extent of the damage from the plowing of “biodiversity lands” will be known at the end of 2022, when each country will notify the European Commission of the extent of their “derogation” plans. The cumulative negative impact could be significant: Ireland has already indicated its plans to plant 25,000 hectares of new arable land, and Bulgaria, according to the Ministry of Agriculture, plans to make full use of the “derogations” and encourage farmers to use all available land for food production and fodder. Only 5% of the land in Bulgaria is set aside for environmental purposes.

The EU’s decision to sacrifice biodiversity for agriculture seems rather controversial in light of the recent Eurostat report “Sustainable Development in the EU 2022” showing good to moderate progress on all UN Sustainable Development Goals (SDGs) (including energy and climate), but rollback on SDG 15 on terrestrial biodiversity. Over the past 15 years, populations of common bird species have declined by 5%, and butterflies in grassy ecosystems by 20%. The report clearly identifies a key driver: “Agricultural intensification is reducing natural nesting sites such as hedgerows, wetlands, grasslands and fallow land, while pesticides and changing crop plowing times are disrupting reproduction and reducing available food sources”. Eurostat, probably anticipating the negative consequences of the recently approved “derogations”, adds the disclaimer that “the impact of the Russian invasion of Ukraine has not yet been reflected in the SDG 2022 report”.

On the same day in March that the EU approved farm subsidies for land reclamation, seven lobbying organizations representing American farmers and their food industry petitioned the USDA for permission to grow crops on more than four million acres of “prime farmland” currently under the protection of the Land Reserve Conservation Program (CRP). Ironically, the 20 million acre CRP is an environmental protection system created 50 years ago when the Soviet invasion of Afghanistan led to a ban on grain exports from the US to the USSR, while many American farmers were producing surpluses. CRP subsidizes long-term fallow or limited use of eroded lands, wetlands, and pastures located on private farmlands. The new proposal is still under consideration.

In early March, Brazilian President Jair Messias Bolsonaro used the looming threat of fertilizer shortages linked to a potential disruption to Russian and Belarusian exports as an excuse to advance a bill to allow mining on indigenous tribal lands in the Amazon. The law was first proposed in February 2020, but was challenged in the courts and found to be unconstitutional. Bolsonaro said mining in the Amazon would make Brazil self-sufficient in the production of potash and phosphate fertilizers. A big scandal erupted when the Social and Environmental Institute of Brazil discovered that only 1.6% of Brazil’s potassium and 0.4% of phosphorus are on indigenous lands. It immediately became apparent that this proposed law was actually aimed at mining gold and developing hydroelectric power on the same indigenous lands. The proposal was again shelved after a major outcry. In April and May, Brazil legally purchased a sufficient amount of fertilizer from Russia, as the deal was not subject to sanctions in connection with the war in Ukraine.

If high food prices and food shortages continue to exacerbate the situation in countries affected by the crisis, it will certainly have a significant impact on natural ecosystems and species. First, people will try to extract food they can no longer buy at retail from the environment, leading to widespread hunting and gathering for food and increasing stress on flora and fauna. Second, to compensate for food shortages, families will expand inefficient but reliable subsistence agriculture. This kind of livelihood-oriented expansion took place on the outskirts of Russian cities during the collapse of the Soviet Union in the 1990s, when the development of “collective gardening partnerships” led to the degradation of many areas of high conservation value important for biodiversity, such as floodplains, wetlands and peatlands. As the current crisis in Russia develops, there are signs that such an expansion could be repeated.

It is very unfortunate that, in the 21st century, the world’s largest food producing countries cannot find better ways to deal with the effects of war. The cases reviewed here show that preserved natural areas, wild flora and fauna are used to compensate for disruptions in food security caused by the war in Ukraine and sanctions against Russia. With the help of governments, industry lobbyists use the crisis as an excuse to exploit natural areas of high conservation value, while starving populations extract food from the environment in every possible way. These adaptations can seriously undermine the implementation of the UN Sustainable Development Goals on biodiversity and biological resources. And this is if we do not take into account the direct invasion of the preserved natural areas. The war in Ukraine and its aftermath certainly provide ample opportunity to find new creative solutions, and the Black Sea Grain Initiative could be one of them, as it reduces incentives to develop valuable natural areas, increasing the supply of food on the world market at more affordable prices.

26 ENVIRONMENT & RIGHTS / 10.2022
Overview of EU progress towards the SDGs over the past 5 years, 2022
(Data mainly refer to 2015–2020 or 2016–2021)

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice and strong institutions
17. Partnerships for the goals

Progress towards EU implementation of the SDGs
Source: EU SDG progress monitoring report, Eurostat, May 2022, ec.europa.eu
https://ec.europa.eu/translate.google/eurostat/en/web/products-statistical-books/-/ks-09-22-0197_x_tr_sl=en&x_tr_tl=ru&x_tr_hl=ru&x_tr_pto=wapp
War with Ukraine or fight against climate change?

**Sunken Russian warship**

**Moskva**

₽42 billion*

≈ $541 935 483

* It is not known whether the cost of armaments was taken into account.

5 wind farms with a capacity**

of 90 MW each

200 days of war between Russia and Ukraine

₽3 trillion

≈ $38,709,677,419

Approximate value calculated on the exchange rate on February 1, 2022

---

The shelling of Ukraine on October 10, 2022 cost

$400-700 million*

The estimated costs of missiles fired vary widely because the exact type of each missile used is unknown. According to Forbes*, Kh-101, Kh-555, Kalibr, Iskander, Tornado-S and S-300 missiles were fired on the territory of Ukraine.

<table>
<thead>
<tr>
<th>Type</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kh-101</td>
<td>$13 млн</td>
</tr>
<tr>
<td>«Kalibr»</td>
<td>$13m</td>
</tr>
<tr>
<td>«Iskander»</td>
<td>$3m</td>
</tr>
<tr>
<td>«Onyx»</td>
<td>$1.25m</td>
</tr>
<tr>
<td>Kh-221</td>
<td>$1m</td>
</tr>
<tr>
<td>«Point-U»</td>
<td>$0.3m</td>
</tr>
</tbody>
</table>

The total cost of released drones is several million dollars.

Total launched
- 84 missiles
- 24 drones

≈ energy efficiency improvement of
12 000 five-story buildings

Degasification and de-petrolization: impact on the global energy balance

How the sanctions imposed against Russia change the balance of international energy markets

VERA KUZMINA
The war in Ukraine has made Russia the world leader on the number of sanctions imposed by other states. The most sensitive of them concern the refusal of the European Union and the United States to buy Russian fossil fuels — gas and oil. How these sanctions will change the energy balance in the EU, Russia and the world, tells Environment and Rights correspondent Vera Kuzmina.

Gas export from Russia until the beginning of 2022

The volume of gas production in Russia in 2021 amounted to 762.3 billion cubic meters. In 2021, 204 billion cubic meters of gas were exported: ¾ to the EU, ¼ to China and Turkey.

In 2021, Russia supplied China with 10.5 billion cubic meters of gas, and this year it plans to deliver around 16-20 billion. Turkey gets around 27-28 billion cubic meters, the CIS countries — 30 billion, and Belarus — 20 billion.

But most of the production — about 500 billion cubic meters — goes to the domestic market.

How Russia reduced gas supplies to the EU by 10 times

The most significant chain of events since the start of the special military operation has been the gradual self-disconnection of Russian gas from the European market, said Maria Pastukhova, senior policy adviser at the E3G think tank.

Gazprom began cutting gas supplies to Europe in December 2021. Daily deliveries fell from 500 million cubic meters per day in December 2020 to 350 million cubic meters per day in December 2021. The state-owned company reported that it had no applications from customers. At the same time, Piotr Naimsky, the representative of the Polish government for strategic energy infrastructure, argued that Russia was trying to speed up the launch of the Nord Stream 2 gas pipeline.

Further, on March 31, 2022, the president signed a decree that foreign buyers must pay for gas in rubles. After some time, the Russian government explained how the payments should be made. In fact, foreign partners had to open accounts in Gazprombank, transfer payments in euros and dollars, and the bank itself would transfer these funds into rubles. However, there were countries that, in principle, did not want to adjust to the scheme proposed by Moscow — Bulgaria and Poland. Then they were joined by the Netherlands, Estonia, Lithuania, Latvia, Great Britain, Czech Republic, Slovenia, and Finland. Russian exports decreased by 30.4 billion cubic meters per year (~20% of supplies to the EU in 2021).

On May 12, Gazprom stopped using the Polish section of the Yamal-Europe gas pipeline, citing a Russian government ban. The gas pipeline runs from Russia through Belarus and Poland to Germany.

In the end of July Gazprom cut gas supplies to the EU even more. Only 20% of the Nord Stream throughput capacity was pumped to customers, that is around 33 million cubic meters daily, while the planned daily volume was 167 million cubic meters. At the end of August, Nord Stream was stopped for repairs — and deliveries were reduced to zero. And in September, after sabotage at both Nord Streams, gas supplies are unlikely to resume in the next few years.

Nord Stream, as Gazprom previously claimed, was launched for greater flexibility in gas supplies. Previously, the gas pipeline passed through Ukraine. At the same time, Germany insisted on using both supply routes. One can only speculate what happened to Nord Stream 1 and why it stopped; says Pastukhova. The backup gas pipeline, Nord Stream 2, could have been used to replace the first Nord Stream, but this became impossible after the sabotage. At the same time, gas transit is still carried out to the EU through Ukraine.

As a result, the EU in October receives no more than 9% of Russian gas from the volume it had before, Pastukhova notes. In her opinion, it will not be possible to switch gas flows to Asia in the next 10 years: there is no infrastructure. So far, there is only a political declaration of intent to build the “Power of Siberia – 2”, but there is no agreement on investments in the project.

In addition, there is a problem with technology, Pastukhova emphasizes. Russia could switch to liquefied gas supplies, but the technologies for its production are European or American, and they are currently not available due to sanctions.
By 2030, gas will occupy a minimal part in the energy balance of the European Union, giving way to renewables and hydrogen.

MARIA PASTUKHOVA,
Senior Policy Advisor, E3G think tank

What the EU will replace Russian gas with

The energy balance of the EU, according to the IEA for 2019, looks like this: coal — 13.85%, gas — 25.6%, oil — 31.7%, nuclear power plants — 12.47%, hydroelectric power plants — 2.75%, renewable energy — 4.14%, biofuels and waste — 9.37%.

The energy balance includes all three sectors: electricity, heating and energy for transport, explains Tatyana Lanshina, a renewable energy expert. “The highest penetration of renewables is in the electric power industry, where more than 37.5% of all electricity in the EU is now produced from the sun and wind. However, in the heat power industry and energy for transport, the share of renewables is much lower. Replacing generation from gas to renewables can increase its share by 10%, but on a global scale it depends on China and India, so it is difficult to link the EU’s refusal of Russian coal and gas with this indicator,” says the expert.

In connection with the Ukrainian crisis, the European Union increased its plans for renewable energy in the electric power industry: earlier, by 2030, it was supposed to reach a share of 40%, and now — up to 45%. Meanwhile, emphasizes Lanshina, we are speaking here only about energy industry, and in 2021 the share of renewable energy was already 37.2%.

The segment of the energy market left by Russian gas is the most promising for replacement with renewable energy sources, Maria Pastukhova believes. In her opinion, the refusal of gas will go in two directions: reducing demand through the introduction of energy-efficient technologies and replacing gas generation with solar and wind energy. Such a transition will take at least 2-3 years.

“It is easier to build a new solar or wind station than to discover new gas fields,” the specialist explains. Also, the EU is actively switching to electric pumps for heating houses, which will lead to an increase in the share of electricity in this segment of the energy balance.

The biggest problem will be the refusal of gas by EU heavy industry, where production technologies require very high temperatures, which so far only conventional generation can provide. Heavy industry will be the driver of change, says Pastukhova. Expensive gas (rising from $600 per cubic meter under long-term contracts in August to $1,246 per cubic meter in October), the price of which, according to forecasts, will not fall to pre-war levels in the coming years, will lead to higher prices for metallurgical products. According to Pastukhova, the rapid transition from gas to other types of fuel is likely to occur through the use of hydrogen.

Experts single out Germany as an example of a country for which gas phase-out would be difficult. There is a large volume of heavy industrial production and 50% of the volume of gas is in the energy balance. The situation in Finland is completely different: the share of Russian gas in its energy balance was only 2%. It was used for heating. The Finns easily gave it up, replacing gas for heating with pellets, or compressed sawdust.

According to Pastukhova, by 2030 gas will take only a minimal share in the energy balance of the European Union, giving way to renewable energy sources and hydrogen.

Will the EU return to Russian gas

Russia has discredited itself as a supplier, so there will be no return to previous deliveries, says Maria Pastukhova. The European Union is trying to work in two directions to overcome the gas crisis: to negotiate contracts with other suppliers and to increase the share of other energy sources.

European companies have begun to actively enter into long-term contracts (10-15 years) for the supply of gas from the US and North African countries. Short-term contracts are currently signed on the spot market: whoever sells will sell. However, Pastukhova believes that this is a temporary measure: dependence on external suppliers is not reliable, as the Ukrainian crisis showed.

Oil. Russia. EU

The EU countries accounted for 47% of Russian oil supplies in physical terms (108.1 million tons; $50.9 billion), TASS reports with reference to the Federal customs service.

The Druzhba oil pipeline connects fields in Western Siberia with refineries, ports and storage facilities in Eastern and Western Europe. Through the territory of Belarus, oil goes along the northern branch of the pipeline to Poland, Germany and the Baltic countries, and through the territory of Ukraine, along the southern branch to Hungary, Slovakia and the Czech Republic.

On May 30, the EU countries reached an agreement in principle to ban the import of Russian oil. The United States, together with the countries of the G7
and the European Union, will impose a ban on the sea transportation of Russian oil on December 5, and a ban on the transportation of oil products by sea on February 5, 2023, Kommersant writes. Sea transportation accounted for about 65% of Russian supplies, the remaining oil went through the Druzhba pipeline.

Hungary, Slovakia and the Czech Republic, most likely, this year will not be able to significantly reduce the volume of imports. They have no other option for importing oil products. Meanwhile, Germany and Poland have announced that they will completely abandon Russian oil by the end of 2022, including the supplies through Druzhba.

With regard to maritime transport, tanker deliveries from Russia to the EU are carried out through ports in the Baltic, Black Sea and Arctic. A growing number of oil tankers are leaving ports with no specific destination, according to Bloomberg. This oil may unofficially enter the EU in one way or another, which will partially offset the effect of the embargo.

When Russia Gets in Trouble With Sanctions

The consequences of sanctions against Russian oil will become clear in late 2022 or early 2023, after they are introduced, says Maria Pastukhova. The head of the European Commission, Ursula von der Leyen, expects that by the end of the year the EU will give up 90% of Russian oil imports.

Maritime deliveries from Russia to the EU after the start of sanctions may be reduced by 60-70%, Druzhba will go 54% of the volume that was a year earlier, BCS Express analysts predict. Meanwhile, Russia intends to redirect oil flows to Asia, Energy Minister Alexander Novak said at the Russian Energy Week. The minister's words are confirmed by the data provided by Neftegaz.ru: Russian oil supplies to China in May 2022 were 55% up compared to the same period last year — they reached 2 million barrels per day. They also exceeded Russia's deliveries to the EU in previous periods. Deliveries to India reached a record high of 975,000 barrels per day in July. The trend towards an increase in the export of oil and oil products was already noted in 2021, when they tripled compared to 2020.

Oil, unlike gas, can be transported by tankers and trains, so it is easier to change the direction of transportation, says Maria Pastukhova. Now we can assume that Russia has lost 1.5 million barrels per day in supplies (about 7-8% of total supplies) in the EU market. There is no exact data on losses due to the ban on the publication of these data by the Russian government.

Pastukhova points to obstacles for Russian oil to move to Asian markets without losing volumes. Previously, tankers with oil were sent from the Arctic ports to the EU, now they will have to go to Asia. These routes are longer, and their capacity is not completely clear. Pastukhova believes that the traditional suppliers of oil to Asian markets from the Gulf of Mexico countries will not cede their share to Russia, so it is not clear whether India and China will be able to “absorb” all the oil no longer going to the EU.

Will the OPEC+ decision save Russia?

In October, the OPEC+ countries agreed to reduce quotas for the extraction of oil by 2 million barrels per day. The reduction will not affect real production, but production quotas, explains Maria Pastukhova. Russia has not worked out its oil production quotas anyway. If we remove quotas that are not reached anyway, it turns out that countries will reduce real production by 0.8 million barrels per day. In her opinion, the reduction in production is reasonable. In most countries of the world, there is an economic recession and falling demand for oil. In addition, oil demand has not yet reached prepandemic levels and is 83% of the 2019 level.

“I believe that this should be considered as a political signal of some kind of unification, but even without the Ukrainian crisis, it would be reasonable for the OPEC + countries to make such a decision,” Pastukhova said. The real blow to the markets will be the start of sanctions.

Will oil sanctions change the EU energy balance?

Most likely, the European Union will replace Russian oil with supplies from Saudi Arabia and the United States, says Maria Pastukhova. To compensate for the loss of Russian raw materials, European refineries are already switching to West African oil from Nigeria, Angola and Cameroon, whose shipments grew by 17% in April compared to the average for this month in 2018-2021, Forbes quotes the opinion of an analyst at the financial group “Finam” by Alexander Potavin. Europe also increased oil imports from the United States — in April it increased by 15% compared to March, to 1.45 million barrels per day.

Russia’s withdrawal from the European oil market in the short term will only lead to a change in suppliers, Pastukhova believes. The change in the energy balance will depend on the replacement of gasoline and diesel car engines with electric cars. In 2020, EU leaders planned to switch to electric motors by 2050. But in July 2021, the European Commission proposed reducing that timeframe to 2035.

Will coal return?

The coal economy has been very volatile throughout the world in recent years. Environmental problems were added to this, explains Maria Pastukhova. Coal has already become the most unattractive investment, even for developing countries.

As a result, almost 50 countries announced in 2021 at COP26 their intention to completely phase out the use of coal in the future. However, China, India, Australia, the US and Russia refused to sign the joint statement.

Coal prices have tripled since the start of the war (a December 2026 Newcastle coal contract is worth
In the EU, the energy balance will affect the global energy balance. Pastukhova also notes that the volume of investment in coal has been declining over the past years, so it is unlikely that anyone will actively invest in it.

What else will affect the energy balance in the EU

First, technology has an impact. In the EU, "green" technologies have reached such a level that there is no need to build traditional standby capacities, as it was before, and it has become possible to include renewable energy sources in the power grid, explains Georgy Safonov, director of the Center for Environmental Economics and Natural Resources at the Russian National Research University Higher School of Economics.

Secondly, the increase in the proportion of hydrogen as an energy carrier has an effect. Now in the EU, the share of hydrogen in the fuel mix is less than 2%. The European Union intended to increase the volume of hydrogen production to 5.6 million tons per year by 2030, and after the start of the Ukrainian crisis, it increased the share of hydrogen to 10 million tons per year from its own sources and imports of the same amount of hydrogen. The EU is creating many programs to support hydrogen production, says Pastukhova. Eighty percent of gas networks can be used to pump hydrogen, Safonov specifies, which means that the infrastructure for its use already exists. According to the forecasts of the specialist, in ten years, changes in the hydrogen market will be noticeable.

How the refusal of Russian gas will affect the global energy balance

In the world energy balance, coal takes 26.9%, oil — 31.6%, gas — 22.8%, nuclear power plants — 4.9%, hydroelectric power plants — 2.5%, biofuels and energy from waste — 9.35%, renewables — 2%.

According to the ExxonMobile's forecast, by 2040 the global energy balance will look like this: the share of oil, gas and coal will be 27%, 25% and 25% respectively, the share of non-fossil fuels will be 23%. The current energy crisis could accelerate the transition, experts say.

The G7 countries in August released a statement of intent to achieve carbon neutrality by 2050. The US, EU and Japan have more ambitious plans. They intend to switch to clean energy sources by 2030-2035. This will mean that the share of renewable energy sources, including hydropower plants, in the energy sector will be 80%, and 20% will be nuclear power plants, says Georgy Safonov.

According to him, the EU will become a leader in the transition to green energy. China, India have also opted for clean energy. 20-30 years ago in India there was a problem with access to energy in general, but now it has been solved, Safonov explains. Technologically, nothing prevents India from switching to renewable energy. This trend is supported by investors who have limited investment in fossil fuels and are investing in renewable energy.

The long-term trend towards an increase in the share of electricity from renewable energy sources will continue, but in the next two or three years there will be a deviation from it, believes Igor Bashmakov, director of the Center for Energy Efficiency — XXI Century. The EU and other countries will reconfigure their energy systems to make them independent from Russian gas. The situation will stabilize in two or three winters, Bashmakov predicts.

The decline in coal-fired generation occurs naturally: old thermal power plants fail, and no one wants to build new coal power plants because of their low efficiency, he recalls.

The Ukrainian crisis has accelerated the transition to green energy sources in those countries that were already going to do it, such as the EU and the US, says Maria Pastukhova. However, countries in Africa and the poorest countries in Asia cannot afford such a transition. Moreover, they are now faced with a shortage of oil and gas. Previously, supplies of liquefied gas went to Pakistan, Bangladesh, Sri Lanka, now, most likely, they have been "taken" by Europe. The same is true with oil. The question arises: how to replace the deficit? Part of it could be covered by Russian oil if these countries are able to pay for it. On the other hand, developed countries were going to allocate $100 billion for the introduction of "green" technologies in developing countries from 2023. But the fulfillment of this intention is still in question. Developed countries are cautious about investing in developing countries because of widespread corruption, Safonov notes. The energy crisis may accelerate the resolution of the issue of Western countries' investments in the "green" energy of the countries of the global South.

Pastukhova suggests that at the international UN climate talks (COP27), which will be held in Egypt, developing countries will criticize the EU and the US for the tense energy situation and ask for effective assistance.

What will happen in Russia

In March, Anatoly Chubais, who was actively promoting the renewable energy agenda and the introduction of hydrogen fuel, left Russia. After his departure, there is no ambassador for the energy transition in Russia. The "green" lobby has been blown away, says Georgy Safonov. Tatyana Lanshina points to the termination of work in Russia and investments by the Finnish company Fortum, the Italian Enel and the Danish Vestas — large energy companies working in the field of renewable energy. Now only the Russian renewable energy development association (RREDA) promotes green energy. All previously approved renewable investment projects remained, the RREDA notes. But this year competitions for renewable energy generation in the wholesale and retail markets...
were canceled by the government. Competitions scheduled for 2023 have not yet been cancelled.

Until the end of hostilities, it seems unreasonable to talk about the development of renewable energy sources in Russia, Lanshina believes. Activities are currently more focused on maintaining competencies.

According to Safonov, against the backdrop of a reduction in the export of gas, coal and oil within Russia, the question will arise – where to direct the volumes that used to be exported. This situation will lead to a struggle within the country between different suppliers of fossil energy resources. The oilmen will have a problem in order to attach fuel oil and low-quality diesel, which have been under an embargo since February-March. After that, the market will have to be divided between three players. Perhaps, fuel oil and diesel will simply be burned so as not to be stored.

The prognosis for the fall of the Russian economy is about 2.4% of GDP in 2023, Interfax cites IMF calculations. Under these conditions, energy consumption will decrease, its market will decrease, competition between gas and coal will intensify, Igor Bashmakov believes.

With such competition between traditional energy sources, there is no place for renewable energy. According to Georgy Safonov, Gazprom is likely to expand the market in the European part of Russia, while it is more convenient for coal miners to stay in Siberia and the Far East. The share of coal-fired generation will depend on gas prices and environmental requirements, says Bashmakov.

"Gasification of small and remote settlements is unprofitable. It is possible to convert large cities such as Kemerovo to gas, but the question arises: will coal be used only for export, which will decrease? The second question is – coal pollutes the environment and has a bad effect on people’s health, maybe we should think about it?" – says Bashmakov.

The economist noted that “Gazprom” can take a niche of gasification of vehicles.

In addition to the internal struggle, the development of renewable energy will also be hindered by a ban on the supply of technologies to Russia, Safonov notes. Even with a high localization of renewable technologies, up to 80%, critical technologies may become inaccessible. In the foreseeable future, the scale of the local market will not be enough to develop localized production capacities. The sanctions pressure and the limited support program – 9-10 GW of new commissioning by 2035, that is, less than 1 GW per year – negatively affect the investment attractiveness of the industry, said Alexei Zhikharev, director of the RREDA, in August 2022 at a meeting of the State Duma. Meanwhile, nevertheless, the high localization of renewable energy technologies in the country will allow increasing the volume of wind and solar generation to a certain extent, Bashmakov believes.

In his opinion, the share of imported equipment for oil and gas production is large, and it is expensive and difficult to replace it under the sanctions. In this situation, domestic renewable energy technologies can become more profitable and will be actively implemented.

In order for renewable generation to develop, a country-level goal is needed, Lanshina believes. The availability of technology is not a sufficient incentive itself.

Thus, two main factors led to the energy crisis: the habit of the EU to receive cheap energy resources from Russia and the war in Ukraine. The European Union was more dependent on Russian gas than Russia on the income from its sale, says Maria Pastukhova. Therefore, Russia had reason to believe that the manipulation of energy resources would put pressure on the Europeans and stimulate the resolution of the Ukrainian crisis in favor of Russia. However, now the EU intends to continue to support Ukraine in the war and replace Russian oil and gas in its energy sector. In the next two years, this will lead to a change in fossil fuel suppliers and an increase in coal consumption, but this is a temporary solution. In the medium term, developed countries will only accelerate the energy transition to clean energy sources.
How war affects grassroots environmental protest

The environmental movement in Russia after February 24: concerns environmental activists have now and problems they face.

ZINAIDA PALVINSKAYA

The shock of the first months and the lull

The grassroots environmental movement has been actively developing in the last decade, celebrating both resonant victories (for example, the movement for the preservation of Kushtau or against the Shies waste dump), and others not so noticeable in to the media, but nevertheless important. The development of the protest movement was not halted by systematic episodes of pressure on eco-activists – neither by the launching of administrative and criminal cases against them, nor by the violence, damage to property and other forms of repression visited upon them (a review of cases of such pressure is regularly published by the Russian Social and Ecological Union, https://rusecounion.ru/ru/ehrd-watch).

After the start of the so-called special military operation in February 2022, there was a lull in the grassroots eco-movement for some time. The lull was also noticeable among environmental organizations, to which initiative groups turn for advice and assistance, and telegram channels that cover environmental protests. One reason is that environmental activists, as part of civil society, experienced the shock of the declaration of war, which, as expected, led to a paralysis of action and a decrease in people’s activity. For many, it was also a kind of crisis of meaning – the inability to continue their usual activities against the backdrop of what was happening. Some activists switched to anti-war protests, and some received administrative fines for this, or served administrative terms in pre-trial detention centers. Others left the country because of their anti-war stance. Inside the eco-community, they started talking about the fact that repressions against opponents of the special operation will also impact environmental protest. Thus, the telegram channel “Ecoprotests” wrote in early March: “The state, which until recently put up with the manifestation of environmental protests, will now consider them as attempts to destabilize the situation. Local leaders, for whom ecoactivism has become a significant obstacle, will certainly use the opportunity to eliminate this obstacle.”

However, a number of protests that were loudly voiced in the information space immediately before the start of the war (for example, the high-profile conflict around the felling of the Trinity Forest) continued, though they were soon forced out of the news agenda.

Secondly, the uncertainty of the situation, the lack of understanding of how to protect one’s environmental rights, of how to solve environmental problems within the current realities, of what will be subject to pressure, of what is ‘possible’ and what is ‘not allowed’, also caused the lull in the eco-protest movement.

Nature does not tolerate emptiness

However, as soon as April and May environmental protests appeared again in the information flow. This, among other things, was influenced by the onset of spring — in the warm season, as a rule, companies begin construction and land work, cutting down green areas, conducting unauthorized dumping of waste, etc.

If we talk about the problems that most often cause protests, they are mostly the same as in recent years: waste problems (pollution from old landfills or the construction of new ones, unauthorized dumps, etc.), preservation of green areas in cities (cutting down urban forests, parks, squares, etc.), atmospheric air pollution, industrial pollution from existing plants and plans for the construction of new ones.

Basically, protest stories are associated with environmental degradation, people’s concern about the damage to their health, and the loss of their usual comfort. Some examples of current protests will be given below.

Speaking about the formats of protest activities, people continue to use traditional formats: collection of signatures (on paper and online), pickets, rallies (which are often either not permitted by the authorities under the pretext of coronavirus restrictions, or activists are allowed to march only far from the city centre), gatherings, flash mobs, etc. Sometimes activists set up tent camps. Some recent examples include: a camp against cutting down the Chelyabinsk city forest for the construction of an ice palace; a camp in the Kemerovo region near road under construction from the Chuazassky coal mining site to the village of Verkhny Berenzas (construction has been suspended).

At the same time pressure on environmental activists continues. According to the monitoring conducted...
by the Russian Social and Ecological Union, in the first five months of 2022, more than 110 activists were attacked, detained, and subjected to administrative prosecution. The total amount of fines under administrative articles amounted to at least 430,000 rubles, or $7,285. (The entire amount of fines assessed in 2021 was 866,000 rubles, or $14,761). Twelve people received administrative arrests for a total of 129 days. In a June interview to The Moscow Times, Vitaly Servetnik, co-chair of the Russian Social and Ecological Union, said: “We have about 20 cases of prosecution of environmentalists for anti-war actions. Activists realize that war is a catastrophe, both humanitarian and ecological. Therefore, I do not know environmentalists who would justify military action. At the same time, there are cases when members of initiative groups in the regions support a special military operation, and this causes tension and splits within activist groups.”

In addition, the possibility of media coverage of the protests has become more narrow because many independent media outlets have been forced to close down, and a number of social networks were declared extremist. The latter, among other things, has reduced possibilities for bloggers and other luminaries covering the protests (a vivid example of this is when a number of Instagram influencers spoke about the protest against the development of Kushtau in Bashkoria). In general, the environmental agenda was supplanted by the news about the war. Nevertheless, there is a tendency for certain environmental issues to be more actively covered by opinion leaders who are far from the “green” agenda, which attracts a wider range of people to join forces for addressing them. Perhaps this is due to increased attacks on freedom of speech and political freedoms, and the environmental sphere remains one of the few areas where people can exercise their civic conscience.

Another systemic problem that has recently become more pronounced in the information field is the pressure on employees of protected areas and nature preserves. This problem, well known within the environmental community, has already begun to go beyond its boundaries. For example, the verdict against employees of the Kronotsky Reserve, who received serious prison terms on charges of embezzling funds allocated to clean up the preserve’s accumulated environmental damage, was widely reported. At the same time, neither during the investigation nor in court, despite numerous petitions, no examinations or assessments of work

Tent camp against cutting down the Chelyabinsk city forest for the construction of a skating rink. Verification of documents.
https://vk.com/wall-205404789_1930
We have about 20 cases of persecution of environmental activists for anti-war actions. Environmentalists absolutely understand that war is a catastrophe, both humanitarian and ecological.

VITALY SERVETNIK, co-chair of the Russian Social and Ecological Union

and the state of nature in the area were carried out. The environmental community and even the regional authorities (the governor and the minister of ecology) came out in support of the convicted employees, expressing confidence in their innocence. The Environmental Crisis Group released a review with a number of cases of pressure on employees of protected areas over the past few years, which begins with the words: “Nature preserves areas have long been a juicy morsel for “business development. Those who really protect them are obviously barriers to enrichment.”

Initiative groups continue to actively exchange experiences both at online conferences and offline meetings. For example, in May 2022, Tolyatti hosted the second interregional conference on civil air quality monitoring. In August, a round table entitled “Preservation of natural monuments and their protection” was held, timed to coincide with the victory of residents in the struggle for the Kushtau monadnock in Bashkiria, where other regions joined in a remote format to exchange experience.

The Authorities’ Response: Protest Without Politics

Analyzing recent environmental protests, one can see that local authorities, both municipal and regional, periodically make concessions and fulfill the demands of the protesters. Some activists attributed this to the upcoming elections in the fall and believe that it was too early to relax. There is also such an opinion about the attitude of the authorities towards eco-activists and the non-political nature of the protest from the telegram channel “Ecoprotests”: “The attitude of the authorities towards this movement is amazing. It can be expressed in a formula: as long as people protest without touching political topics, they have a chance to be heard. There are more examples when mayors and regional heads met halfway and fulfilled the demand of eco-activists than in the calm 2021.” Another observation by the author of this channel concerns the position of the authorities: “It is surprising that we learn about rallies and gatherings in the context of statements from authorities, who promise to investigate, take measures, appoint a prosecutor’s inquiry, etc. There is not even a hint from them that foreign special services are using the protesters. In the old days, although not often, the authorities could discount environmental protests that way.”

There is news about the intensified fight against environmental violations by law enforcement agencies. The Telegram channel “Green Serpent” at the end of July reported that, following the results of a thematic coordination meeting of heads of law enforcement agencies chaired by the Prosecutor General with the participation of top officials of the FSB, the Ministry of Internal Affairs, the Investigative Committee, the Federal Customs Service and the FSPP, a draft resolution was prepared providing for tougher criminal and administrative penalties for environmental offenses: “The participants of the meeting put under control the work on corruption on the part of officials exercising permitting and control and supervisory functions in the environmental sphere.”

From Kaliningrad to Vladivostok

Another common trigger for protests is the inefficient implementation of the waste reform. At the same time, residents are not only against landfills, but also against waste sorting and processing enterprises: they are sure that instead of sorting, a landfill or an enterprise will appear where they choose a minimum of recyclable materials for processing, and the rest will be buried. Residents also fear that they will incinerate waste under the name of recycling, especially because by law incineration is acknowledged as a form of reuse. Public distrust is caused by the secrecy of information and the unwillingness of local authorities to engage in dialogue. As an example, locals of Berezovsky, a satellite city of Yekaterinburg, oppose the construction of a landfill. In the Arkhangelsk region, residents of Nyandoma demand the construction of a waste sorting complex with a landfill be halted. The possible construction of the landfill is opposed in the Sosnovsky district of the Tambov region. In the Kirov region, as a result of mass discontent among residents, the acting governor suspended the construction of a waste sorting complex until the circumstances were clarified. Protesters in different regions collect signatures to the authorities. These are just some examples of anti-waste protests. In summer, the problem is exacerbated.
by the fact that fires break out at obsolete and overloaded landfills and unauthorized dumps, residents are disturbed by strong odors.

Another problem that often causes protests is developing wood cutting in green areas. Among recent examples is the conflict over plans to cut down the Pychimsky pine forest in Komi for sand mining. In the fall of last year, in response to a 1,600-signature petition, the head of Komi forbade logging closer than 10 km from the settlements. But the conflict escalated this summer with the start of logging: residents stopped workers and blocked roads. To resolve the situation, the authorities initiated a working group, and at the end of July terminated the lease agreement for the plot — though the official version says the project was halted over debt.

The conflict around Birch Grove in Yekaterinburg has escalated, most of which is planned to be cut down for the construction of a residential complex. People are seeking to give the grove the status of a protected area — an idea that was supported by the Ministry of Natural Resources of Russia in an official response. Nevertheless, preparations for development continue. At the same time, in Yekaterinburg, activists managed to defend a local park from being razed for the construction of an office building. After collective appeals from citizens, the mayor’s office stopped the project.

In Karelia, where in 2017 local activists managed to defend the Sunsky Forest, there is a struggle to protect a spruce forest on Mount Kurgan in Petrozavodsk from the construction of a sports cluster in the forest. Activists and scientists from the Karel Scientific Center of the Russian Academy of Sciences have united their efforts.

In the Ryazan region, as a result of a protest against the sale of a forest belt (residents, confident that it will be cut down after the sale, collected signatures and held pickets), the acting governor suspended the deal. At the end of July, in Novosibirsk Academgorodok, people went out on the streets demanding a halt to the destruction of forests for the construction of a university campus, as well as against cutting down trees for the construction of residential building and a highway in one of the districts.

Many conflicts around deforestation occur in the Moscow region (for example, the fight against the construction of a school in the Kraskovsky forest in Lyubertsy or against cutting trees for the construction of a church in Salaryevo in the southwest of Moscow) and in the Leningrad region.

One trend is protesting against so-called improvement plans that threaten the urban natural environment of different cities. Thus, serious conflicts, even clashes between residents and builders, are observed around the improvement program for Moscow protected areas (Bitsevsky Forest, Pokrovskoye-Streshnevo, Kuskovo), for which more than 60 billion rubles, or $990 million, have been allocated. Scientists and conservation organizations consider these plans a threat to urban biodiversity and against federal law. Similar conflicts occur in other regions as well.

The number of protests related to the protection of natural protected areas or the struggle to give territories the status of protected areas is growing, and periodically the initiative groups win. In Nizhny Novgorod, environmentalists and activists collected signatures against the construction of a bypass road in Artemovsky meadows. This area is home to dozens of species of rare birds. Some time ago, the authorities allowed the creation of a natural park on the territory of the Artemovsky meadows, but the plans were scrapped for construction.

After several years of active struggle by residents of the Kurortny district in St. Petersburg against the construction of a ski-roller track on the territory of the Shchuchye Lake reserve, the prosecutor’s office finally suspended the project and filed a motion with the Chairman of the Environmental Committee. The cost of designing the facility was excluded from the targeted investment program for 2022. However, activists write in a VKontakte group: “We are sure that it is too early to relax, and the threat of construction in the reserve has not disappeared.”

The struggle of Kaliningrad activists for the preservation of the Suzdal park from development ended successfully. Activists managed to ensure that the territory will be assigned the status of a protected area of regional significance. On this path, activist Yevgeny Tokar and other park defenders had to overcome many obstacles.

In Khabarovsk, residents filed a lawsuit with the Central City District Court demanding that the felling in the Khabarovsk Arboretum be declared illegal and that authorities be required to restore the cut trees. The arboretum has the status of a protected area, where the authorities have planned to build various sports and entertainment facilities. According to residents, this threatens unique plants. In August, the court took the side of the residents and declared illegal the actions of the director of the arboretum in cutting down trees.

Another acute environmental issue that continues to stimulate civic engagement is the fight for clean air. There is a growing number of cities where residents are deploying a network of atmospheric air quality monitoring sensors in order to receive independent data (for examples, groups in Chelyabinsk, Moscow, St. Petersburg, Ryazan, Tolyatti, Sterlitamak, Cherepovets, Sibay and other cities). There is an intensive exchange between the groups and even inter-regional face-to-face conferences. The general aim is to organize round-the-clock monitoring of emissions from industrial enterprises and publish data online so that people know what they breathe.

The problem of air pollution will soon be exacerbated by the fact that the government, against the background of sanctions interrupting supply chains from other countries,
has allowed the production of cars that produce three times more carbon monoxide than was allowed by the previous Euro-5 standard.

The causes of air pollution are different, and the results of environmental protests are also different. For example, residents of the village of Gorki Leninskie in the Moscow Region have been demanding for years to solve the problem of illegal waste incineration in industrial zones at night, unfortunately with no result. But the appeals of citizens in Orel about regular air pollution by excessive dust emissions led to the owner of an asphalt concrete plant terminating its lease to Orlovsky Asphalt LLC and the reconstruction of the plant with replacement filters.

A significant number of protests are caused by plans for the construction of various facilities and industrial projects. Basically, the rhetoric of authorities boils down to the argument that public environmental indignation is contrary to the economic interests of the state, and that the protesters are hindering the creation of jobs, the flow of taxes, etc. This is the position of authorities in Primorsky Krai, where people are protesting against pollution from new oil and coal terminals, as well as the possible construction of the Nakhodka mineral fertilizer plant.

In St. Petersburg, protest has been ongoing for several months against the new artificial widening of the Island of Decembrists in the Vasileostrovsky district to accommodate housing construction, which would deprive people of beach access. Residents handed over 22,000 signatures to the authorities and even blocked the road for construction vehicles.

In April, the residents of Kazan succeeded in halting the construction of a mosque in a recreational area along the Kazanka River, a favorite recreation spot for local residents. More than six thousand signatures were collected, and activists appealed to the Prosecutor General’s Office.

And this is only a small part of the local environmental protests in recent months that began or continue after the declaration of war.

**Deterioration of environmental legislation**

Environmentalists predict an increase in industrial pollution and other environmental offenses due to a moratorium on routine inspections by Rosprirodnadzor until the end of 2022, as well as because of a number of changes within a packet of anti-sanction laws. These include a two-year delay on establishing quotas for polluting emissions and the creation of requirements for large
polluting enterprises in order to control emissions of harmful substances. They also include automatic extension and simplification on issuing a number of permits for natural resources users, the adoption of a number of acts that threaten forests and other similar measures.

Thus, Alexander Kolotov, director of the environmental organization "Plotina", notes with great concern that, according to satellite data by the "Rivers Without Borders" ecological coalition, the number of detected cases of pollution from gold mining, as well as the pollution of rivers, increased significantly after the moratorium on Rosprirodnadzor inspections went into effect. Before the moratorium, environmentalists managed to combat pollution by involving supervisory authorities when they identified violations via satellite monitoring. But now inspections are carried out less often, and Rosprirodnadzor is often limited to issuing warnings to possible violators of environmental legislation instead of taking more severe measures.

Another problem is the increase in agricultural pollution occurring as a result of intensive farming, particularly after the adoption of a law that allows the use of animal waste as fertilizer – which also exempts this waste from legislation governing waste and pesticide management. This legislation was adopted despite opposition from the All-Russian Popular Front and the Public Chamber of the Russian Federation.

The public is also reacting to attempts to water down environmental legislation against the backdrop of the so-called special operation in Ukraine, and it has scored victories in a number of cases. One of the clearest examples is public opposition to the planned amendment of a number of federal laws governing protected natural areas, the protection of Lake Baikal, environmental impact studies, and town planning and building codes. The version of the draft law adopted in the first reading allowed for building infrastructure on protected lands. In addition, the draft law would have permitted the construction of such infrastructure without conducting environmental impact assessments on the concerned nature reserves, national parks, federal reserves and Lake Baikal. The law caused a backlash among environmentalists and the public, which sent tens of thousands of letters to relevant Duma committees as part of a campaign launched by the Russian branch of Greenpeace. Popular bloggers and opinion leaders urged opposition to the draft law. The State Duma Committee on Ecology and Environmental Protection criticized the law. This led to the drafters making significant changes in the text. Plans to redesignate protected areas were abandoned, environmental impact studies remained mandatory (except for main infrastructure). According to experts, the new form of the law poses less of a threat to protected areas and Lake Baikal, representing a significant victory for civil society.

Another draft law, according to which public organizations would be stripped of thier right to initiate and conduct public environmental impact studies also caused a stir among environmentalists and civil society. In the draft legislation this right would be reassigned to regional and municipal public chambers, which may refuse to conduct the impact studies. According to the draft law, experts involved in public environmental reviews are not entitled to transfer project documents to third parties, which would thereby deprive citizens of their right to information about environmentally hazardous projects. Seventy-five civic organizations and initiative groups sent a collective letter against the law to the chairman of the committee of the State Duma. The Human Rights Council under the President of the Russian Federation and the Commission on Ecology and Environmental Protection of the Civic Chamber of the Russian Federation opposed the adoption of the document. As a result, the profile committee of the State Duma said the law would not be considered in the current version. The draft law was sent back for revision.

In general, attempts to weaken the legislation on protected areas, aimed at withdrawing territories for economic activity, have intensified, which the environmental community has observed and beat back in recent years.

Thus, looking at how the grassroots "green" movement is developing today, it can be said with confidence that as long as activists do not express anti-war sentiment, they will be able to continue environmental protests and even seek solutions to problems from the authorities at various levels.

At the same time, environmental activists continue to be under pressure. Attempts to oust independent public organizations and groups by government-organized non-governmental organizations – so-called GONGOs – are noticeable. Military actions and anti-crisis measures taken by the state have aggravated of a number of environmental problems. It is difficult to predict what will happen next. In any case, the eco-community, environmental organizations and initiative groups should unite for joint action.

Attempts to weaken the legislation on protected areas, aimed to ease the withdrawal of its territories for economic activity, have intensified, which the environmental community has observed and “beat off” in recent years.
“Litigation, investigations and prosecutions will continue many years after the bullets stop flying”

Doug Weir: We usually start talking about this with World War I as an example. The industrialization of warfare has given great potential for environmental impact on a significant scale. On the battlefields of northern France and Belgium, we can still observe high levels of heavy metal contamination.

More focus came around 1970s in Vietnam, and it was closely linked to the worldwide rise of the environmental movement and environmental consciousness in general. On the footage, everyone saw what was happening in Vietnam, how Agent Orange and other herbicides were sprayed around and how Rome plows drove, causing massive deforestation in the east of Vietnam. That was the time of rise of the environmental movement, which led to a corresponding political reaction – an international humanitarian law during conflicts started to include elements of environmental protection.

The consequences of which other military conflicts have been well studied?

Cornell University did a study on air war in Indochina (air attacks on northern and southern Vietnam, Cambodia, northern Laos, and the Ho Chi Minh trail during the Vietnam War of 1965-1968, spraying of herbicides and other chemicals over agricultural fields in Vietnam in 1951–1967. – Note ed. ) and their environmental consequences.

In the Iran-Iraq war of 1991, oil spills and oil well arsons triggered a political response from the United Nations (the Compensation Commission, established by decision of the UN Security Council, satisfied 109 claims from Kuwait and other states and international organizations against Iraq to cover the damage inflicted during the war, including environmental damage, totaling $5.261 billion US – Note ed.).

Lastly, after the wars in the Balkans (1991-2001 – Note ed.), the UN environmental program started to do quite detailed post-conflict environmental assessments. Since then, we started to have much deeper understanding about the environmental dimension of the conflicts and what kind of damage we can see in them.

Then more recently, in 10-15 years, with increased access to satellite images, open-source intelligence and social media, we were able to track environmental issues in conflicts much closer to real time, and this visibility has quite significant implications for policy work and legal frameworks for the protection of the environment.
What are the main environmental consequences of wars?

I think the simplest way to think about it is through direct and indirect damage. First of all, when we think about war and the environment, we think about direct damage from bombings in forests or oil facilities blown up, and then they get most of the headlines.

And in addition we see indirect effects, many of which are linked to the changing socio-economic conditions in areas affected by conflict. This may be an increase in mining due to the permissive legal environment. It might also be overharvesting of firewood. The collapse of environmental management can have a big impact – in a lot of conflicts, states tend to fall apart or governance may be distracted, so you don’t have an environmental ministry for example and miss the access to domestic and international funding for environmental projects.

So you have this huge legacy from a lot of conflicts which can last for years way beyond the direct damage.

Are the environmental consequences different from the wars of this century and the wars of the past?

Comparing today to the Vietnam War, you would no longer see the widespread massive use of defoliants (chemicals that cause plants’ leaves to fall off – Approx. ed.) and herbicides. But since most countries are now much more dependent on energy, industrial and water infrastructure than they were a hundred years ago, the destruction of such facilities is becoming more frequent in conflicts and can carry environmental risks. For example, looking at the conflict in Ukraine, which has a highly developed industrial sector, we see a great environmental risk in the conflict area.

In addition, with biodiversity crisis, climate change, and pollution, a lot of ecosystems are in a much worse state than a hundred years ago, so they are more vulnerable to any negative impact.

Can the war affect the work of environmental activists?

I have been studying the environmental impact of wars since 2005, and I think at least historically there was a sense that when a war happens, people stop caring about the environment because they have more immediate priorities. But lately there have been more media and more access to communication tools, more developed and diversified civil society organizations in many conflict areas, and we see that environmental organizations do continue to operate both on a community level and nationally.

We see an active civil society in Iraq, Syria, Yemen, Libya, which is trying to do very difficult work in very challenging circumstances. They need support from the international community in any form. For example, this could

---

DIRECT DAMAGE

The result of the bombing and explosions.

INDIRECT DAMAGE

The state ceases to fulfill its obligations for environmental protection. Environmental projects lose funding.

---

Photo Credit: State Emergency Service of Ukraine
https://www.facebook.com/photo/?fbid=434848132016415&set=pcb.434851995349362

Photo Credit: Martin Wegmann / commons.wikimedia.org
https://commons.wikimedia.org/wiki/File:Deforestation_NZ_TasmanWestCoast_2_MWegmann.jpg
be the provision of satellite images for data collection, funding training for those who work on the ground. We work with some organizations in Yemen and Libya, providing them with technical advice and support.

- Is it possible to use the data you collected in future international courts?
- The main problem is a lack of precedents for states to be accountable for environmental damage during military conflicts. There is only one significant case from the Gulf War, when the UN Security Council set up a UN Compensation Commission to use Iraqi money to pay reparations to neighboring countries for the damage, also to the international community and corporations. And some of these claims referred to environmental damage.

Another example, although less successful, is when Israel built the separation wall across the Occupied Palestinian Territory. A UN commission was established to collect evidence of damage and destruction to water sources as a result of the building of the wall. But there was never any money for the compensation process. Perhaps at some point in the future there might be a potential for some compensation related to it. But so far this was an example, when there was lack of political will to allocate money from Israel for the environmental damages that it caused by the building of the wall.

Since then, there have not been such significant cases where compensation for environmental damage would have been established. In my opinion, we would need a some kind of ad hoc tribunal. In this context, it wouldn’t be coming from the UN Security Council, but the General Assembly could consider something.

Theoretically, it is possible to freeze Russian assets in other countries and use them to pay reparations, including compensation for environmental damage.

Another side of the question would be what environmental data can be collected to be used in court. The tribunal will set the rules of what kind of information could be used. This was sort of a question for us when we were collecting data from Ukraine remotely. But we cannot collect something like water samples. How archived social media data and satellite imagery can be used in future litigation is also a question. The Ukrainian government is taking some field samples from the affected areas. So the data is being collected, and, probably, it will be possible to use it in some form in a future international tribunal. But the better question, mostly political rather than legal, is whether such a tribunal can be established and whether money would be available for reparations.

- Do we need a new international law to protect the environment during conflicts?
- Yes, I think it is necessary, because over the past 10-15 years we have made significant progress in collecting environmental data and evidence from the field. The criteria developed after the Vietnam War under international humanitarian law were extremely permissive. For environmental harm to be recognized as an environmental war crime, it must be wide spread, long-term, and severe – has to be all three of those things and those thresholds are not particularly well defined.

In 2009, the United Nations Environment Program published a major report on the state of legal protection of the environment in conflict situations. They argued that we can try to develop environmental protection during conflicts using not only international humanitarian law, but also international environmental law, human rights and international criminal law. UN lawyers have been developing a new set of legal principles describing how the environment should be protected during conflicts and how to assess damage not only directly during the conflict but also after it has ended, as well as steps that can be taken before the outbreak of conflicts to reduce environmental problems. Soon they should be adopted at the UN General Assembly.

Many of these principles will be non-binding on states, but it is still a step forward in terms of legal protection. The Principles establish a normative framework for expectations of what governments should and should not do in terms of protecting the environment in conflict.

- What are the most serious environmental consequences of the war in Ukraine?
- We see massive destruction of constructed areas that creates a lot of environmental risks from waste that should be disposed of, asbestos

"For environmental harm to be recognized as an environmental war crime, it must be wide spread, long-term, and severe – has to be all three of those things and those thresholds are not particularly well defined."

DOUG WEIR,
Research and Policy Director
at the Conflict and Environment Observatory (CEOBS)
which would be released, in addition we see fighting around industrial areas as well and there was a kind of narrative which was there since 2014 and Donbass was a terrible place to have a conflict, because of many highly risky industrial sites. Huge impact on natural protected areas on land and at sea.

From a legal point of view, industrial facilities cannot be attacked. But in practice, during a conflict, everything looks much more complicated. The Azovstal metallurgical plant became involved in the conflict and was bombed and shelled with a wide range of weapons from Russia. Civilians took shelter under it, and the Ukrainian military chose it as a last resort. At the same time, the ecological narrative around these events was completely absent.

Thus, we need to look at real examples of how industrial facilities can be drawn into conflict and think about how to prevent such cases. At a minimum, the environmental narrative around these incidents should not be hushed up.

What we see happened around nuclear facilities in Ukraine, in Zaporizhzhia, in the Chernobyl exclusion zone, is completely extraordinary. Occupation, using a nuclear power plant as a shield, Ukrainian drone strikes near the reactors, gunfights on the territory of the nuclear power plant itself... We must make sure that this does not become the norm in any way, this is absolutely unacceptable.

Do you think the Ukrainian government continues to take measures to protect the environment, or are they relegated to the background?

I think that there has been a shift in the priorities of the Ministry of Environmental Protection and Natural Resources of Ukraine from its usual activities to trying to financially assess the environmental damage caused by the conflict in order to make claims for damages in the future.

There are also changes in environmental legislation, which Ukrainian NGOs are paying attention to. For example, the introduction of a simplified mechanism for converting land into agricultural land and a number
of additional permits for economic activities that clearly affect the environment. It will be interesting to see how it will play out, because Ukraine is a country which has a quite well developed environmental civil society, who are quite vocal and experienced in dealing with their government and whether they will be able to kind of hold a line on this stuff remains to be seen, but they are perhaps in a better situation than in many other countries.

– *In your opinion, does the war affect the environmental and climate policies of other countries?*

– I believe that this conflict can have the most serious impact on global environmental regulation. As soon as the Russian invasion of Ukraine began, climate change was just knocked off the international agenda. We have an IPCC report coming out, it’s a prediction of what our civilization will look like unless we take action to limit our impact on the climate. Normally it would be in headlines around the globe but after the war, it lost priority. We have not seen this in other recent conflicts. Agreements within the framework of the climate negotiation process at the UN level, the convention on biodiversity, the preparation of a new international treaty on plastic – everything is sidelined reflecting the geopolitical disturbance caused by invasion. I think the third kind of environmental impact of this conflict is the impact on global environmental governance.

– *Do you see any changes in the environmental and climate policy of the UK related to the war in Ukraine?*

– The government reacted to the fuel crisis caused by the conflict and tried to push for more oil drilling in the North Sea. There was also a situation a couple of months ago when money which were kept for climate change adaptation funding in developing countries was re-prioritized to spend on weapons for Ukraine. I also expect pressure in the agricultural sector now, to loosen the control on pesticides and to increase the productivity of land.
From a legal point of view, is it possible to hold anyone accountable for the negative impact of armed conflicts on the environment? How is this regulated by international law?

Carroll Muffet: The answer to that is quite complex. I think you need to begin from the recognition that the Russian invasion of Ukraine was in clear violation of international law – that creates a really important backdrop for analyzing the legal consequences of what occurs from here going forward.

If you look at Iraq’s invasion of Kuwait, here was again an example of a clearly illegal war. The international community dealt with it by setting up a special commission to address legal claims arising from the war, including environmental claims. So that precedent exists, and is very relevant here.

Obviously there wasn’t the additional complicating factor that a commission was set up underneath the UN Security Council and Russia as a member of the UN Security Council. (each permanent member of the UN Security Council has the right to veto when resolving any issue. – Note ed.). But I think that the international community will find a pathway for establishing accountability both for Russia as a state and for individual actors who are complicit in the aggression with respect to accountability for the environmental harms.

I think there are multiple potential Routes for that. First, it is important not to ignore accountability under Ukrainian law. Ukraine has already begun to investigate war crimes. Since these crimes are of universal jurisdiction, other countries are also investigating, including Germany and France.

It is also important that Ukraine had a relatively solid baseline of data, against which to compare the consequences of the war, and I think that baseline of data, coupled with the fact that there is active monitoring and data collection going on even during the conflict positions, I think, lays a really strong foundation for long term accountability of Russia.

I think that accountability is ultimately going to take many forms. For example, there are clear instances in which the conduct of the Russian troops violates well established laws of war, including the Martens Clause (the principle of the law of international conflicts, which says that in situations not regulated by other provisions of international law, the parties must be guided by the principles of humanity, the requirements of public conscience and international customs. – Note ed.) and the Rome Statute of the International Criminal Court (an international treaty that established the International Criminal Court, adopted in 1998 and entered into force on 01.07.2002. – Note ed.). Those provisions speak to not only causing widespread and irreversible harm to the environment where I think there are numerous instances but also the threats that threaten to unleash dangerous forces, which significantly increase the risks of environmental catastrophe. The risks associated with the occupation of the Chernobyl nuclear site or the Zaporizhzhia nuclear power plant are very hard to ignore. I don’t think the nature of legal action in this context is extraordinarily complex.

One of the things that we learn from the history of war and the environment is that the litigation, the investigation, the prosecution, all of those things will continue for many years after the bullets stop flying. And it’s really important. Everybody wants everything to happen right now. But no responsible lawyer will say that is going to happen quickly. But if you look at the evidence and the foundations of the law, I think that there will be prosecutions arising out of this, that there will be routes to long term accountability not only for individuals, but for the Russian state itself.

Were there any changes to the international law regarding the protection of the environment during military conflicts in recent years?

I don’t think that there has been a significant development in formal standards. In general, I think that the existing law is sufficiently clear to encompass the sorts of crimes that we are seeing.

Where there is chemical contamination from warfare, direct attacks on nuclear facilities, attacks on industrial facilities in heavily populated areas, my own sense is that the existing law is sufficiently broad and clear enough to encompass those sorts of harm. In addition, there is responsibility for ecocide under the Ukrainian laws, so there are opportunities for prosecution and accountability not only under international law, but also under the laws of Ukraine itself.

Is it possible to prosecute citizens of Russia and other countries for war crimes under Ukrainian laws, and how might this look in practice?

Yes, citizens of other countries may fall under the jurisdiction of Ukrainian courts, including Russian citizens who are in Ukraine and those who make military decisions while remaining in Russia. They can be taken into custody in other countries outside of Russia, transferred to Ukraine and prosecuted.

If you look at the legacy of conflicts over the last half century you will see case after case after case in which ultimately a high level decision maker flees the refuge of the place where they’re beyond jurisdiction and travels to France, travels to Switzerland, travels to South Africa, travels to Mexico and can be taken into custody and moved into a place where they will be held accountable. In the current context the key decision makers are safely ensconced in Russia and not exposed to jurisdiction. But the flip side to that is that anyone with true accountability for these processes for decades to come will be leaving Russia at their peril because they will face the risk of being taken into custody and held accountable. That is why I emphasize the slow nature of legal liability. This means that although in the near future it may seem that the main criminals will escape justice, in the long term it will be very, very difficult for them to do so.
The war in Ukraine and subsequent sanctions dramatically changed the situation for the Russian economy, affecting its ties with the outside world. Sanctions have significantly hampered the export of raw materials and access to modern technologies and technological products. As the climate and environmental policy of the country is primarily the regulation of the economy, management in the field of fossil resources use, as well as the use of new technologies in cooperation with other countries, the outbreak of military action on Ukrainian territory and the subsequent rupture of economic ties Russia has with many countries has a direct influence on the policy of the state in environmental and climactic spheres.

At the same time, the Russian economy continues to function, and within the country there are various natural ecosystems, the preservation or degradation of which affects the climate balance and the ecological well-being of the planet. One example of these ecosystems are the boreal forests, which cover an area of 12 million square kilometers in Russia.

Russia – when other types of forests are also taken into account – accounts for one fifth of the planet’s forest reserves. The hope for the absorption capacity of Russian forests in solving the problems of greenhouse emissions, which is mentioned both in the speeches of authorities and in important documents concerning the directions of the decarbonization of the Russian economy (for example, in the Low-Carbon Development Strategy), makes the forest an important element of the overall construction of Russia’s climate policy. And in this sense, the impact of the general changes taking place in the Russian economy after February 24, 2022 on forestry makes it possible to understand what metamorphoses this structure has undergone, and also whether additional risks have appeared for the safety of important Russian ecosystems.
Changes in Russian climate policy

In the face of all these dramatic turns, Russia’s climate policy has remained unchanged since February 24, most likely because it is so unambitious. On March 21, at a meeting with representatives of the United Russia political faction, Deputy Prime Minister Alexander Novak, who oversees the government’s fuel and energy complex, confirmed that the government does not support a revision of the approved course for decarbonization, and said that “strategically changing goals and objectives is not advisable.”

Presidential advisor on climate issues Ruslan Edelgeriev, speaking at the national oil and gas forum at the end of May, also stated that it was “unreasonable” to revise Russia’s climate obligations, even in the face of sanctions pressure. It’s possible that the climate agenda remains almost the only area for interaction with countries that are now commonly referred to in Russian official Newspeak as the “collective West”. This is apparent in a comment by Edelgeriev, who confirmed at the St. Petersburg Economic Forum that negotiations with the Biden administration on climate issues are “on pause”, but, nevertheless, “because of a local conflict, international activity cannot be nullified.”

The goal set out in the preferred scenario of Russia’s Low Carbon Development Strategy is to achieve climate neutrality by 2060. Traditionally, in documents related to climate and low-carbon policy, Russia makes a reservation that the country plans to achieve the declared indicators with maximum consideration for the absorption capacity of natural ecosystems, primarily forests. At the same time, some important elements of preparations for carbon emissions regulation, which were approved before February 24, are now somewhat postponed, but not canceled.

In particular, the launch of the so-called Sakhalin Experiment, a pilot project to regulate greenhouse emissions and achieve carbon neutrality within one Russian region, the Sakhalin Region, has been postponed by six months, from March 1 to September 1, 2022. However, it should be acknowledged that the decision to postpone the experiment was made on February 15, that is, before the start of hostilities on the territory of Ukraine. At the same time, the law on conducting a regional experiment, which involves achieving carbon neutrality in the Sakhalin region by the end of 2025 and preparing a regional system for recording greenhouse gas emissions and introducing carbon quotas, was signed by the President of Russia in March 2022 – after launching Russian troops on the territory of Ukraine.

As far as one can judge from the official documents of the regional authorities of the Sakhalin Oblast, it has at present been decided to combine the programs already being implemented to increase energy efficiency and improve the environmental situation. In any case, the governor of the region, Valery Limarenko, at the forum “Environmental Policy and Sustainable Development”, held in Yuzhno-Sakhalinsk on October 6-7, 2022, spoke about energy efficiency as the main tool for reducing the carbon footprint. “At first glance, ‘global competitiveness’, ‘new technologies’, ‘innovation’, ‘energy efficiency’ sound somewhat abstract to the average person. But “clean air”, “clean water”, “comfortable environment” are quite specific,” Limarenko said. From these words it follows that the framework of the Sakhalin experiment, envisions “repackaging” some of the previous long-term measures that have already been implemented by the authorities that affect the reduction of greenhouse emissions.

Igor Makarov, head of the climate change economics laboratory at the National Research University Higher School of Economics, believes that big changes in Russia’s low-carbon development plans due to the outbreak of hostilities in Ukraine and sanctions pressure on the Russian economy should not be expected: “The strategy itself and the goals stated in it are not too ambitious and do not imply the adoption of any radical decisions to reduce emissions, so the new factors that appeared after February 24 cannot affect it much.” And he explains that the expected slowdown in the Russian economy under the new conditions will lead to a reduction in emissions even without the special measures of a low-carbon strategy. However, he says the Russian-
Ukrainian conflict could have a significant impact on the corporate plans of Russian companies to reduce carbon emissions.

In Makarov’s view, a number of export-oriented companies in Russia had planned to launch major projects aimed at reducing their carbon footprint in order to meet Western criteria for corporate practice. However, now that they have lost access to international funding and necessary technologies due to the current sanctions, they will most likely be forced to curtail or reschedule their plans. At the same time, companies are unlikely to abandon the steps already being taken to decarbonize their activities. “Western markets, where accounting for such measures is important, are far from being closed for all Russian business. In addition, many companies are considering plans to develop Asian markets, which also have their own carbon regulation,” the expert says.

The absence of changes in plans to decarbonize the Russian economy means the preservation of a large role for forests, the absorption role of which is given special emphasis in Russia’s climate commitments.

Makarov points out that in recent years the state has allocated considerable funding to scientific research and the development of new methods to determine the actual amount of carbon absorbed by Russian forests. “As I understand it, the results of these studies were supposed to help achieve several goals. The first of them was ‘imaging’ – the establishment of presumably larger volumes of absorption than current ones, would allow Russia to talk about a significant role in solving the problems of Earth’s climate change. But now the international image of Russia is determined by completely different factors, and this goal can be forgotten,” he explains.

According to the expert’s explanation, authorities also wished to use the data to promote international business schemes for offsetting carbon credits. But these projects, apparently, will not be possible to implement anytime soon. Therefore, only the fundamental goal remains – that of obtaining new scientific data on carbon sequestration in natural systems. These data, Makarov hopes, could eventually form the basis of new projects on the use of natural mechanisms for carbon absorption and will be important for a better understanding of the mechanisms of carbon turnover on the planet.

The new and old realities for forests

As follows from the analysis of Russia’s climate strategy, the forest is the basis of climate policy and should be under the protection of the state in order to meet carbon sequestration targets. But since the start of the war, the forest sector, like other sectors of the Russian economy, is under threat. The revocation of FSC trade certificates from Russian manufacturers in March 2022, which confirmed that products were manufactured in accordance with environmentally sustainable forest management standards, effectively closed western lumber markets for Russia, as well as Russia’s ability to supply products to global producers who pay attention to whether raw materials are obtained in accordance with environmental standards. Along with the sanctions imposed by the European Union and Japan against the supply of timber and wood products from Russia – and the counter-sanctions of Russia prohibiting the supply of raw materials to produce plywood and paper to unfriendly countries – this had a significant impact on the entire forest industry (especially in Northwest of Russia, where the extraction and processing of wood has traditionally focused on export deliveries to Europe). Nevertheless, as numerous reports show, at least some Russian forest products continue to reach Europe through re-export channels from Asian countries. In particular, Vietnam has become a major supplier of birch plywood to the United States in 2022. In addition, Singapore increased the supply of lumber from Russia by 17 times, which may also indicate that this island state, with its developed port infrastructure, is being used for the re-export of Russian products.

It’s possible that the partial compensation of significant export restrictions, as well as the implemented line of maintaining the previous settings in environmental and climate policy, leads to the fact that after February 24 there were no fundamental changes in the field of forest management. In any case, Konstantin Kobyakov, the chief
coordinator for projects for forests of high conservation value at the WWF.

Russia, when assessing the latest innovations in forest legislation, believes that the vast majority of them are associated with the continuation of previous trends in the weakening of forest management, and not with extraordinary changes in the situation after February 24.

Kobyakov draws particular attention to the postponement of introducing the Federal State Information System for the Forestry Complex (FSIS LC) – a consolidated complex of digital accounting on the state of Russian forests and the economic activity conducted within them, which should combine the existing elements of regional accounting, as well as control and individual details of national accounting operations in forestry (for example, EGAIS Les, which digitally controls the turnover of wood). The commissioning of the first stage of this system, planned for 2022, was postponed until 2025. However, according to Kobyakov, the technical complexity of implementing this measure, and the additional burden placed on timber producers due to its introduction, made it unlikely that the initial deadlines would be met even absent the additional difficulties that arose in the timber industry after February.

One important piece of draft legislation that changes the regulation of economic activity in forests is a set of amendments currently being considered, which would allow for sanitary felling in the central ecological zone of the Baikal natural territory. The area around Lake Baikal has a special protected status, where since 1999 such actions have been prohibited.

Such a decision, after the introduction of numerous sanctions, at first glance, fits into the course proclaimed by the Russian authorities to free businesses from “excessive” inspections and deregulate to stimulate economic activity. This raises fears that one of the directions of such deregulation will be the weakening of environmental compliance. However, from Kobyakov’s point of view, the possible return of sanitary felling in the areas around Lake Baikal rather reflects a general trend characteristic of fluctuations in environmental legislation in recent decades: “Sanitary felling itself is a necessary and useful procedure for forestry. Another issue is that companies often use permits meant for sanitary felling for ordinary deforestation, which has nothing to do with protective measures. When scandals start around this, the authorities, instead of establishing an effective system of control over such logging, prefer to simply ban them. Then, when diseased trees begin to accumulate in the forests, the idea arises that their sanitary removal is still necessary, and the pendulum swings in the other direction.”

In the spring, a draft law prepared by the Ministry of Defense was circulated, which proposed conferring to the Ministry the right to cut down forests without any approval (but with subsequent notification of the oversight authorities) in the event that such felling was necessary “for the needs of defense.” Should the law be adopted, the harvested timber in these cases could be transferred skirting general procedure and without accompanying electronic documentation. Kobyakov admits certain grounds for such a law: “In the end, one can imagine a situation where the military needs to quickly build some object and cut down a forest for this. Indeed, in such circumstances, approval for felling may not be required.” In any event, this law has not yet been adopted.

Nevertheless, Kobyakov notes some initiatives to weaken environmental regulation for logging. He points primarily to the possible elimination of the conservation status that applies to forests on the banks of spawning rivers. These areas measure from several hundred to several kilometers along the banks of rivers where spawning by valuable species of fish takes place. Currently, such forests are prohibited from being cut down, but the Federal Forestry Agency plans to eliminate this category of forests (while maintaining the ban on cutting down small water protection belts).

According to Kobyakov, this measure could be dictated by the interests of the timber industry, since in many regions these protected bands along rivers remain one of the last sources of valuable timber. As such, abolishing the rule – according to which the area of a single cut area cannot exceed fifty hectares – is being discussed.

According to the WWF representative, an increase in the area of clear cuts will, of course, complicate reforestation and increase pressure on biodiversity. But it will not have a critical impact on the state of Russian forests. In general, as Kobyakov points out, the problem of Russian loggers after February 24, is primarily bound up in the search for new markets and the establishment of transportation. As such changing environmental requirements is not among their primary wishes.

We can observe that the “military factor” has so far had only a limited impact on the climate policies implemented by Russia and has little effect on the management system of economic activities in forests, whose absorbing capacity is an important element of Russia’s climate strategy. Instead, this state of affairs indicates the long-term passivity shown by Russia in the climate arena. In this case, the dramatic changes in Russia’s economic ties since the start of the war have had little effect on its climate commitments, which can be sustained largely by what momentum the Russian economy still has. At the same time, Russia’s isolation in many traditional markets deprives it of the opportunity to sell traditional export goods, including forestry products, according to previous schemes. This, in turn, reduces many of the incentives for intensifying timber production, indirectly contributing to the conservation of forests.