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# WAR OF ATTRITION: COMPARING CAPABILITIES

Analytical report
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# SUMMARY

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The Russia-Ukraine conflict has approached yet another critical phase that could become a turning point in the war, or at least determine the further course of events more clearly. It is needles to repeat about the global significance of the issues that Ukrainian defenders are addressing now. Ukraine's military success will not only determine the fate of our country, but also shape the prospects for security and stability around the world.

It is also important to understand the broader international context, which has a direct impact on the shape, scale and speed of Ukraine's success. First, it is about the radical changes in the perception of the current Putin regime. While many Western politicians used to believe that Russia should be an integral part of collective security, the longer the conflict continues, the more it becomes clear that it is Russia's aggressive policy that generates the main danger. Awareness of this fact by other countries determines their positions on the Russia-Ukraine, their measures to deter the aggressor and help Ukraine.

Prospects for a political and diplomatic settlement of the Russia-Ukraine conflict are currently almost non-existent, despite numerous mediation initiatives. One of the key reasons for this is the situation typical of many armed conflicts, when both sides are optimistic about the possibility of achieving a military victory and seek to improve their future negotiating position on the battlefield. Only time will tell whether the calculations of each of the warring parties were reasonable — those based on conclusions about the superiority of their own capabilities over the enemy's combat potential.

The goals of Ukraine's offensive campaign are to liberate all the occupied territories, inflict losses on Russia that would render it impossible for it to aggress again for a long time, and at best, start the process of Russia's disintegration.

Russia still has a rather strong mobilisation and military-technical potential to last for a while. The ongoing depletion of replenishment sources is to some extent compensated by the concentration of forces on the most important areas of combat operations. If the current Ukrainian offensive does not reach a strategic turning point, Russia will be able to accumulate forces, reinforce defences in the occupied territories and turn the war into a protracted one.

Some Western partners' political circles pin certain hopes on a decisive, fast-paced offensive by the Ukrainian Armed Forces. Accordingly, there are questions and even complaints about the slow pace of the Ukrainian forces' current offensive. But given the current balance of power, a single, even decisive offensive will almost definitely fail to achieve the desired result — a complete victory over Russia — and will be accompanied by huge Ukrainian losses.

Ukrainian forces' offensive campaign will consist of a set of offensive and defensive operations interconnected in terms of goals, resources, and time. Its main tasks (stages) are the following:

- Engaging in active defence and deterring Russian counterattacks in certain areas of the front. The main types of combat action include:
  - ✓ counter-battery artillery fire;
  - ✓ exchanging assault operations in certain areas of the front;

- ✓ holding positions;
- ✓ striking the enemy's command and control and logistics systems at a tactical and operational depth.

• Breaking through of the enemy's echeloned, well-equipped defences; capturing bridgeheads to deploy and build up the offensive group of forces and their logistical support. The success of this task will depend on the Ukrainian Armed Forces' ability to

- ✓ cross large and dense minefields and pierce well-equipped defence lines;
- ✓ inflict fire damage to enemy groups at tactical and operational depth;
- ✓ advance through mined terrain under enemy fire deep into the Russian troops' defensive order;
- ✓ ensure reliable air and flank cover for the advancing troops;
- ✓ prevent the approach of enemy's operational reserves by destroying them in places of concentration and on routes of advance;
- ✓ ensure timely replenishment of losses and throw own reserves into the battle;
- ✓ move up logistics;
- ✓ ensure rapid evacuation of the wounded and damaged equipment.

• Bringing operational and strategic reserves into action; manoeuvring forces and means; developing an offensive on a broad front or in several separate directions with the encirclement of enemy groups; liberating and clearing settlements and territories. This will require the availability of

- ✓ powerful, highly mobile, fully equipped, and trained formations;
- ✓ a large number of means of high-precision and area destruction of the enemy troops, reserves, command and control systems and logistics at operational and strategic depth
- ✓ engineering equipment to cross minefields, natural and artificial obstacles;
- ✓ assault units trained to operate in urban settings;
- ✓ military gendarmerie trained to counter sabotage groups and interact with the population in the de-occupied territories;
- ✓ reserves to replenish losses.

• Defeating Russia's strategic reserves and restoring the state border of Ukraine. One should be prepared for the possibility of Russian troops holding off the Ukrainian offensive in certain areas and launching a counter-offensive using strategic reserves. Under these conditions, the need for artillery, tanks, army aviation, and long-range weapons is growing.

Effective intelligence, air defence and support, and electronic warfare will be vital at all stages of the offensive campaign. No less important is covering large cities and strategic infrastructure from missile and drone strikes.

Along with the skill of the Ukrainian Armed Forces' high military command, operational and tactical commanders and non-commissioned officers, training and courage of personnel, coherence and interaction of units and formations, other important conditions for implementing the above capabilities and achieving necessary results are timely accumulation and replenishment of sufficient reserves of manpower, weapons, ammunition, military and special equipment. Ukraine's sources for creating and replenishing the necessary mobilisation and military-technical potential are the country's own, currently limited, capabilities of the state and society, and invaluable assistance from partners.

The pace, volume and range of weapons, military and special equipment — primarily long-range missiles and aircraft to support the advancing forces and provide them with cover from air strikes — will have a significant impact on the pace and results of the Ukrainian offensive. The delay in the provision of such equipment is due to differences in how Ukraine and some of its Western partners see the «victory over Russia».

# WAR OF ATTRITION: COMPARING CAPABILITIES

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**This report attempts to compare Russia's and Ukraine's combat capabilities as of July 2023. Given reservations about the completeness and reliability of openly available information, the dynamism and unpredictability of events on the front line, it is clear that the balance of power can change quite quickly. At the same time, there are currently good reasons to believe that the parties are very likely to maintain a relative parity of combat capabilities, suggesting the continuation of the war of attrition with uncertain outcomes.**

## CURRENT SITUATION AND ITS POSSIBLE DEVELOPMENT

Russia's attempted large-scale offensives in the winter and spring of 2023 were thwarted by the Armed Forces of Ukraine's (AFU) skilful active defence, demonstrating the limited ability of the Russian General Staff to plan and implement strategic offensives. With the failure of large-scale offensive, Russian troops limited themselves to tactical assault operations in certain areas of the frontline and focused on building an echeloned defence system and launching massive missile and drone strikes against peaceful Ukrainian cities throughout the country.

At the current stage of the war, Russia, having lost its strategic initiative, is increasingly resorting to threats of using nuclear weapons**, and after blowing up the Kakhovka Dam, there is a real threat of Russia** destroying the Zaporizhya NPP and other man-made hazardous facilities in the occupied territories, such as the Crimean TITAN. Russia's outright genocide and ecocide in Ukraine, its attempts to exert political and economic pressure on Western countries, and its flirtations with the Global South are aimed at bringing Russia out of isolation and persuading the West and the Ukrainian leadership to negotiate exclusively on Russian terms.

In turn, Ukraine has launched a summer and autumn offensive campaign of its own. The Ukrainian military command does not disclose its plans for the current campaign, and even warned against inflated expectations. In any case, it may well be a turning point or another stage on the way to the strategic goal of defeating

the Russian military group and liberating all occupied territories. While fulfilling the tasks of protecting Ukraine from air strikes, de-occupying Ukraine's east and south from Russian invaders, facing stubborn resistance of Russian troops that relies on the aggressor's still powerful mobilisation and economic potential and that of its foreign allies, and suffering painful losses of their own, the Ukrainian defence forces need a large number of weapons, military and special equipment, and replenishment of trained mobilisation reserves.

The success of Ukraine's summer and autumn offensive campaign depends on the availability of not only a strong offensive but also defensive grouping, including forward forces and operational reserves in the second echelon. Ukrainian forces are currently engaged in active defence and tactical counter-offensive actions along the front of almost 1,500 km long. Military operations of this scale and intensity also require powerful strategic reserves designed to reinforce the defence forces (if necessary) and form an offensive group. The AFU have created new brigades, including 17 (the total strength of 63,000) that have been trained and equipped with the help of Western partners. Nine assault brigades of 20,000-30,000 troops have been created within the Ministry of Internal Affairs.

The sources for forming and maintaining Ukraine's defence and offensive potential include the system of mobilisation and training of human resources; military and technical support from Western partners, including training of troops; own defence industry, including preserved and restored domestic enterprises and joint companies with European partners; and the volunteer movement. After 18 months of a war of attrition, even the Russian leadership acknowledges that Ukraine's offensive potential is far from exhausted.

To deter the Ukrainian «counter-offensive» and hold the occupied territories, Russia, disregarding its own losses, is conducting tactical counterattacks in an attempt to force the AFU use its strategic reserves, inflict significant losses and then launch its own counter-offensive. For this purpose, Russia is currently using operational reserves and redeploying troops to the most dangerous areas from other segments of the frontline.

Also, while attempting to address the current manning and equipping problems, Russia has been repeatedly trying to create a powerful strategic reserve. By the end of June, it planned to complete the formation of a reserve force, which, according to Shoigu, will receive more than 3,700 pieces of equipment and which already includes an army corps, an army and five tank regiments, with 1,336 people entering service every day and 114,000 contract soldiers and more than 50,000 volunteers already recruited. There are reports of an enemy forming a strategic reserve of new military units and divisions within the 25th Combined Arms Army of the Central Military District (motorised rifle division, two motorised rifle brigades and one tank brigade) and the 40th Army Corps of the Southern Military District — a total of 22 divisions, including 10 motorised rifle, 5 artillery, 5 marine and 2 air assault divisions. Even though they are expected to be ready in early 2024, this task will hardly be fully completed. Recalling how Russia used the reserves during its winter offensive, when they had to use a significant number of troops trained for this purpose to replenish losses at the front, the newly created strategic reserves may be depleted before the beginning of their desired large-scale offensive.

The key question that will affect the situation at the front is whether warring parties have sufficient capabilities to maintain the defence forces in a combat-ready state and create strategic reserves. The main sources of their formation are the systems of mobilisation and military-technical support. The availability and effective use of these sources will determine the parties' and their partners' vision of the end of the war and the actual course of events. Moreover, Ukraine and Russia alike have faced, albeit to varying degrees, the problem of limited domestic capabilities and are forced to resort to external assistance.

## MOBILISATION CAPACITIES

The problem of securing human resources for warfare is becoming increasingly important as the fighting continues. This problem has both quantitative and qualitative dimensions. The need to fully restore losses and build up forces at the expense of mobilisation reserves has become one of the most difficult tasks for both sides. To address this problem,

the warring parties use similar (traditional) and radically different approaches.

## *RUSSIA*

After the Kremlin's initial plans for a so-called «special military operation» ended in a fiasco and AFU had successful counter-offensive operations in autumn 2022, the Russia-Ukraine conflict gradually evolved into the war of attrition. At least one party to it, namely the Russian Federation, openly declares its readiness for the long-term combat, as well as confidence in the sufficiency of own resources to achieve its goals. The Kremlin believes in its superiority in almost all material and human components of its military potential, despite the number of objective reasons to doubt such assumptions. For example, Russia's economic and military-technical advantages are largely offset by comprehensive external support available to Ukraine, and Russia's quantitative advantage in human resources — by the quality of Ukrainian forces and differences in the attitudes to soldiers' lives.

Even according to conservative estimates, Russia's losses exceeded 200,000 personnel as of July 2023. The size of the Russian force early in the invasion was about 330,000, including ground forces — 150,000, naval and air forces — 70,000, FSB and Rosgvardia — 18,000, private military companies — 8,000 and mobilisation reserve — about 80,000. According to Russian calculations, this was sufficient to complete their «special military operation» (SMO). However, the unexpected fierceness of Ukrainian resistance and the losses incurred in the first weeks of fighting forced the Russian leadership to adjust its SMO plans. The first involuntary step was to withdraw troops from the northern regions of Ukraine at the end of March 2002 and redeploy them elsewhere along the frontline to strengthen other groups. Initially, the task of replenishing losses and creating reserves was successfully carried out through various alternatives to forced mobilisation (contract soldiers, volunteers, mercenaries).

In early autumn 2022, it became apparent that the contingent of those willing to volunteer for war did not cover the growing need for manpower. At the end of September 2022, the Kremlin was forced to declare a «partial mobilisation», which allowed it to increase the nominal number of troops by 300,000 in a short time. The mobilisation process revealed problems related to the coercion to participate in the war, shortcomings in the registration and recruitment system (military enlistment offices), and the inability to accommodate such a large number of recruits (placement, uniforms, weapons, training). Hundreds of thousands of Russians subject to conscription urgently left the country to avoid mobilisation.

The first wave of large-scale «partial mobilisation» caused no serious political consequences for the Russian authorities. At the same time, it has become clear that Russia, while possessing a huge mobilisation potential, has significant resource and time constraints on its use. There is also a growing need for a constant supply of personnel to man up the warring units and create reserves. To address this problem, the Russian authorities are resorting to various measures, including atypical ones, such as exemption from criminal punishment in exchange for readiness to fight, or recruitment of people with criminal records.

The practice of involving prisoners in hostilities, introduced by the notorious owner of the PMC Wagner Group, was later adopted by the Russian MoD to form *Storm Z* assault units as part of the regular army. According to various estimates, Wagner's Prigozhin, with the Kremlin's consent and support, recruited approximately 50,000 recruits from Russian penal colonies in a few months, with 40,000 of them eventually killed or seriously injured.

Since the onset of the war, Russia has never abandoned conscription and even increased the number of conscripts. Such soldiers are not involved in combat operations in Ukraine, except cases early in the invasion, although there are known instances of conscripts killed in action in the areas bordering Ukraine. Conscripts help the Russian military leadership address the problem of creating a trained mobilisation reserve and fulfilling plans for recruitment to contract service. In the spring of 2023, 147,000 persons were to be drafted into the Russian army, 12,500 more than in the previous year. That is, the annual replenishment with conscripts could hypothetically amount to almost 300,000. It is known, however, that the actual figures are considerably lower than planned, and the spring conscription in 2022 attracted only about 90,000. In 2023, Russia decided to raise

the upper limit of the conscription age from 27 to 30 years, allowing it to recruit some of those who previously avoided the draft.

According to German intelligence, Russia can mobilise up to 1 million soldiers for the war against Ukraine within a year. Hypothetically, Russia could mobilise up to 4 million more by lifting a number of restrictions, but this should take into account factors such as the exhaustion of potential in the occupied territories and Russia's peripheral regions, which provided a disproportionately high share of the mobilised.

In any case, Russia's mobilisation potential is significant, but not unlimited. Russian experience of mobilisation has shown that the Putin regime is not ready to wage a prolonged, high-intensity war. In addition to time and resource constraints on the rapid build-up of personnel, it is also necessary to mention Russia's lack of mid-level officers, which is especially relevant for the army, where NCOs do not have the appropriate instructional and commanding powers and skills.

### *UKRAINE*

Just before the war, Ukraine's mobilisation potential was estimated at 2-2.5 million, including almost 420,000 with combat experience. From day one of the war, the Ukrainian authorities adopted all necessary decisions provided for by legislation in the event of armed aggression, including the announcement of general mobilisation. According to Ukrainian law, men between the ages of 18 and 60 who are fit for military service, as well as women in certain professions, are subject to mobilisation. In the first days and even months of the war, long lines of volunteers formed at the territorial recruitment and social support centres (TRSSC). Preference was given to those with relevant military specialities, military training and combat experience. As late as autumn 2022, officials claimed that there were no problems with mobilisation. However, later, there were increasingly frequent reports of difficulties with recruitment, as well as the quality of recruits through «forced» mobilisation.

According to official reports, the size of the Armed Forces of Ukraine at the end of 2022 was about 700,000, and with the personnel of other security agencies, the total size of Ukraine's defence forces was close to 1 million. A sharp increase in the size of the AFU from 261,000 to 700,000 occurred at the beginning of the war, and there were no other «peak» mobilisations thereafter. Despite the lack of reliable latest data as of July 2023, it can be assumed that the Armed Forces' total size has not changed significantly, and the purpose of mobilisation is to replenish losses and create small reserves. One of the key factors of the number of troops is obviously the supply capabilities. Ukraine's top military and political leadership has repeatedly emphasised that «Ukrainian army is sufficiently manned, but needs more weapons».

Ukraine has also suspended military conscription and lowered the age limit for conscripts from 27 to 25. This has reduced the burden on TRSSCs related to the r egistration of this category of individuals liable for military service, who are also not subject to conscription or mobilisation in wartime as persons registered as conscripts.

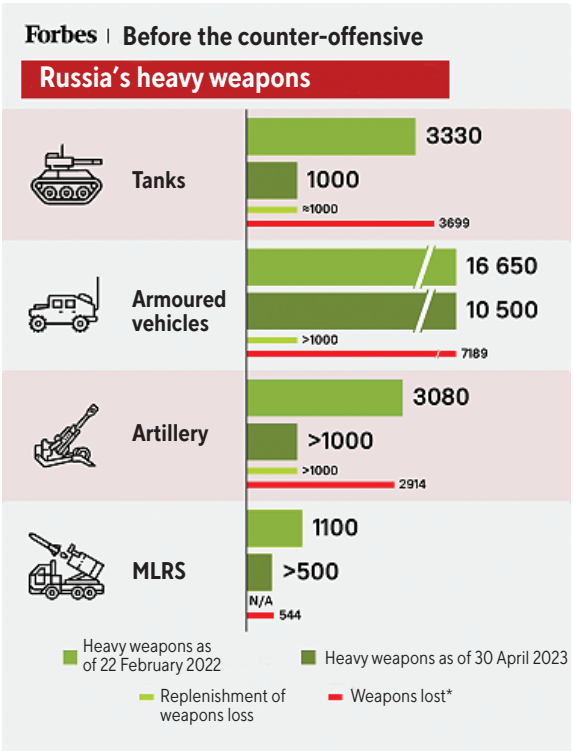
Unlike Russia, Ukraine has never involved prisoners to participate in combat action.

## MILITARY AND TECHNICAL CAPABILITIES

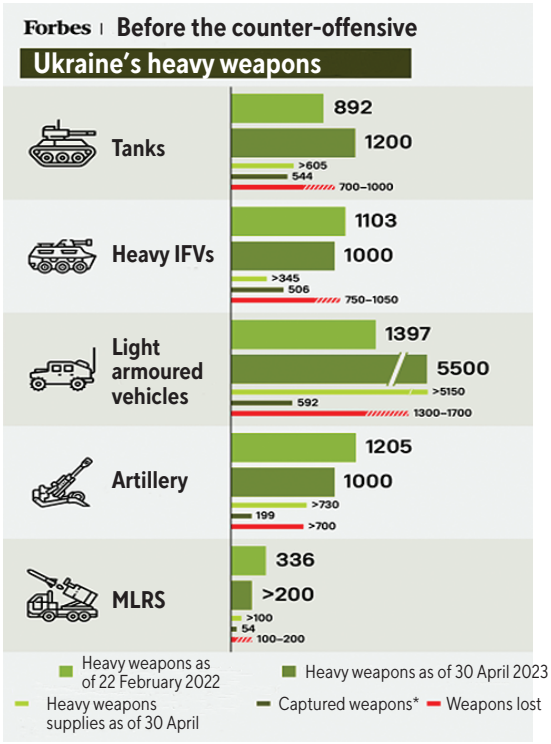
In an attempt to assess the Russia and Ukraine balance of powers in the context of the AFU's summer and autumn campaign, it should be noted that the data presented below are purely indicative due to the limited and closed nature of relevant information, as well as the prevalence of large amounts of heterogeneous, unverified, often contradictory, politically charged and incomparable data.

If at the beginning of the full-scale invasion Russia had a significant advantage in weapons, then by the end of April 2023, there was a relative parity of forces on the front (Figure 1). In the meantime, opposite trends are becoming increasingly evident — the depletion of Russia's reserves of modern weapons and the consistent build-up and support of Ukraine's military and technical potential through the transfer of high-tech weapons from the international coalition.

**ВІЙСЬКОВО-ТЕХНІЧНІ ПОТЕНЦІАЛИ РОСІЇ ТА УКРАЇНИ, СТАНОМ НА 30 КВІТНЯ 2023 р.**




*Ukraine General Staff data
**Sources:** open sources, Forbes estimates




*Oryx data as of 30 April 2023
**Sources:** open sources, Forbes estimates

## *RUSSIA*

Various estimates suggest that since the beginning of its full-scale aggression, Russia has lost 30% of tanks, 27% of armoured vehicles, 21% of artillery, 23% of aircraft, and 32% of helicopters, including weapons removed from storage. The trend in the rate of Russia's losses in armaments, military and special equipment has been upward over the past six months (columns 3 and 4 of Table 1).

**LOSSES OF RUSSIAN TROOPS SINCE THE ONSET OF THE WAR, AS OF 1 JULY 2023**

| Personnel and military equipment | Total losses, as of 1 July 2023 | Average monthly losses during: | | | Cost of losses, $ million |
|---|---|---|---|---|---|
| | | October-December 2022 | January-March 2023 | June 2023 | |
| Особовий склад | 228,870 | 15,450 | 22,213 | 19.970 | |
| Танки | 4,042 | 225 | 195 | 237 | 6,280.6 |
| ББМ | 7,868 | 375 | 301 | 385 | 4,709.1 |
| Гармати | 4,162 | 206 | 218 | 653 | 3,350.4 |
| РСЗВ | 632 | 29 | 34 | 55 | 573.9 |
| Засоби ППО | 389 | 12 | 22 | 56 | 2,730.0 |
| Літаки | 315 | 6 | 8 | 2 | 5,921.7 |
| Гелікоптери | 308 | 14 | 7 | 10 | 3,214.6 |
| БЛА | 3,545 | 246 | 152 | 388 | 316.6 |
| Крилаті ракети | 1,261 | 155 | 63 | 154 | 3,783.0 |
| Кораблі (катери) | 18 | 0.03 | 0.7 | - | 936.0 |
| Автотранспорт | 6,794 | 307 | 267 | 456 | 1,015.6 |
| Спеціальна техніка | 580 | 16 | 38 | 111 | |
| **Total cost** | | | | | |

Combat losses in money terms (column 5 of the table) and Western sanctions have significantly affected Russia's financial capacities and the capabilities of its defence industry. In 2022, Russia spent 5.51 trillion rubles on defence (or $80.61 billion at the Bank of Russia's exchange rate of 68.35 **USD/RUB**). Official budget expenditures on defence in 2023 are estimated at about 5 trillion rubles ($65.4 billion, at the 2023 exchange rate of 76.5 USD/RUB projected by the Ministry of Economic Development). Meanwhile, Bloomberg concludes that the classified share of the Russian budget will account for nearly a quarter of all expenditures for the whole of 2023 and will be due to an increase in expenses classed as «other expenses in the field of national security» (2023 expenditures under this item are planned in the amount of 4.4 trillion rubles, or almost $58 billion) and other «peaceful» expenditures. In the first months of 2023, Russia's military spending exceeded 2 trillion rubles (nearly $29 billion), which is more than 40% of the officially planned defence spending for the whole of 2023. According to official Russian forecasts, GDP will fall by 0.8% next year, but the cost of mobilisation and the impact of Western sanctions are set to blow a hole in the government's budget forecasts — according to pessimistic estimates, Russia's GDP will fall by 8%. Independent analysts predict the Russian economy shrinking 2.5%; the World Bank expects a 3.6% contraction.

Russia's defence industry is currently facing significant difficulties with the supply of production equipment and components, especially microchips, bearings, and materials. Under these conditions, even with its «parallel» imports, Russia is unable to roll out a full-scale serial production of high-quality weapons and at least bring the rate of its supply to troops closer to the rate of losses. The main sources of partial compensation include illegal and semi-legal imports; search for weapons and ammunition in countries that once received Soviet military equipment (Belarus, North Korea, South Africa); purchase of weapons from countries supporting Russia (drones and ammunition from Iran); localisation of foreign weapons production (Iranian drones); transfer of defence enterprises to a round-the-clock operation and the use of low-skilled workers, including prisoners.

Below are expert assessments of Russia's current capabilities to rebuild its armed forces' technical fleet — with certain adjustments for financial, sanctions and traditional Russian management problems — in terms of major types of weapons and ammunition.

### *Tanks*

In early 2023, the Russian armed forces had about 1,900 tanks, plus about 5,000 tanks of outdated models at storage bases. Among the latter, 57% are generally suitable for use after refurbishment or overhaul. However, the ability of Russia's defence industry to produce new tanks and repair damaged and old ones is not enough to fully compensate for their losses on the battlefield. According to The Economist, Russia's main tank manufacturer, UralVagonZavod, and three other armoured-vehicle repair plants can only build 20 new tanks and deliver 59 upgraded and refurbished tanks (with simplified equipment) every month. Two more plants with a total capacity of 34 vehicles per month are due to come online by the end of the year. Such capacities will hardly ensure the delivery of the promised 1,500 new T-90 tanks in 2023 and are almost three times less than the monthly losses. According to the Military Balance, the Russian army received 33 T-90 tanks, which most likely went to the strategic reserve. Last year, Russia also received 111 T-72 tanks from Belarus. Further use of arms supplies from abroad is unlikely due to both sanctions and the exhaustion of these sources.

### *Armoured vehicles*

At the beginning of 2023, the number of APCs/IFVs in the Russian army was about 9,500. To replenish combat losses, Russia had about 6,000 APCs/IFVs in storage in early 2023, of which no more than 3,500 vehicles can be delivered to the troops after repair. The status of the development and production of six IFV modifications of the promising *Armata*, *Kurganets-25* and *Boomerang* series (two T-15, B-11, B-14, B-15, K-17) with strong armour and weapons is unknown. However, due to the lack of funds and relatively high cost, their launch into production is currently unlikely. Therefore, Russia's losses in armoured vehicles cannot be compensated for either by supplying IFVs/APCs from storage bases or by producing new ones.

### *Artillery*

Russian troops are beginning to feel the shortage of artillery, given its heavy losses

(653 units in June 2023 alone) and insufficient capabilities to compensate for them. This is confirmed by the use of recommissioned T-54, T-55, T-62, and even the latest T-14 tanks as field artillery, as well as the increased use of attack helicopters on the contact line. Early in 2023, Russia had about 5,500 self-propelled and towed cannons, 3,120 MLRS and 500 mortars in storage. Due to the high intensity of fire, artillery barrels are wearing out rapidly. Some stocks are still available in storage, but further restoration of these stocks and artillery capabilities on the battlefield is complicated by the lack of appropriate equipment in the Russian defence industry, as it was imported from the West.

### *Ammunition*

Early in its full-scale invasion, Russia had approximately 15-20 million artillery shells. 12-14 million were either fired or destroyed by the AFU. Production is estimated at 2.5 million shells per year. Russia received hundreds of thousands of artillery shells of various calibres from Belarus, Iran, and North Korea. The rate of Russian fire during the first quarter of 2023 averaged 24,000 shells per day. At the current rate of fire, as many as 7 million shells could be used in 2023. This is quite a significant amount, but heavy losses, limited production capacity, logistical problems, and the need to maintain a strategic reserve force Russian troops to reduce daily shell consumption and look for more effective ways to use artillery, including the widespread use of *Orlan-10* drones for target reconnaissance, the use of 152-mm *Krasnopol* shells with laser guidance, partial replacement of artillery fire with *Lancet* drones for precise target killing, etc.

### *Aircraft*

Currently, Russia is able to keep the existing number of aircraft in its grouping, but with the increased density of Ukrainian frontline air defences, Russian aviation losses will rise significantly. In 2022, the Russian defence industry transferred 29 combat aircraft to the MoD. In 2023, it is planned to deliver up to 7 Su-57 Felon fighters, 12 Su-35S Flanker-E fighters, 12 Su-34 Fullback fighter-bombers, 10 Su-30SM2 Flanker-C fighters and 12 Yak-130 Mitten trainer jets, as well as 1 or 2 Tu-160M2 Blackjack strategic bombers, up to 4 Il-76MD-90A Candid transport aircraft and one Il-78M-90A Midas refuelling aircraft. However, it is believed that Russia has traditionally overstated real figures both in terms of quantity and quality of production. Moreover, according to Ukrainian intelligence, the Russian aviation industry is having issues with production of engines for long-range aircraft, and information about these planes' production essentially means the extension of their service life. Taking into account the existing production capacity and cost indicators, it will take 10 years and $12 billion to restore the Russian aviation industry's losses.

### *Helicopters*

As of June 2023, the number of helicopters in the Russian armed forces was about 1,300. When preparing to its winter offensive, Russia concentrated 300-400 combat helicopters at airfields in Russia, Belarus and Crimea. By redeploying them from other military districts, Russia is able to replenish the losses of army aviation. However, its helicopter fleet will reduce due to losses, as well as problems with their repair and production. In 2023, according to Russian experts, Russia may lose 30% of its helicopters due to problems with engine supplies (their main supplier was Ukraine's *Motor Sich*) and other components. The decline in production is already affecting not only the Russian army, which has to resort to «technical cannibalism» to repair helicopters, but also the country's export potential, which provided funds and access to technology and components: Russia is losing markets in India and African countries. The situation will hardly improve, at least in the near future, because of the Russia-Iran agreement on the joint production of Mi-28 and Ka-52 attack helicopters.

### *Missiles*

As of 1 June 2023, the Russian Federation has fired about 2,700 precision-guided missiles at Ukraine since the onset of the war. Taking into account the missile stocks before the war (2,257 units) and production in 2022 — early 2023, their balance is currently about 440 units. Despite the sanctions, Russia's military defence industry is increasing production of long-range missiles and is capable of producing more than 10 Iskander missiles, up to 30 Kalibr sea-launched cruise missiles, 35 X-101 missiles and 60 air-launched missiles, including Kinzhal air-launched ballistic missiles, every month. It should also be borne in mind that part of these

missiles should be kept in reserve as potential carriers of tactical nuclear weapons (Table 2). However, it seems that Russia no longer considers the stock of these missiles to be «inviolable». In order to save high-precision long-range missiles, Russia is massively using old X-22 aircraft missiles and S-300 missiles for air defence systems, which are already out of production but whose stocks are estimated at several thousand units.

### *Unmanned aerial vehicles*

The main source of replenishing UAVs, which are massively used and lost at the frontline and in terrorist attacks on Ukraine, is supplies from Iran and China. According to the Ukrainian General Staff, as of early July 2023, Russia has already used about 1,600 of the 1,800 drones received from Iran, but deliveries continue. Russia has managed to reach an

**RUSSIAN NON-STRATEGIC NUCLEAR FORCES, JANUARY 2022**

| Type/Russian designation (NATO designation) | No. of launchers | Year first deployed | Range (km) | Warheads × yield | No. of warheads |
|---|---|---|---|---|---|
| **Non-strategic nuclear forces** | | | | | **1,912** |
| **Navy weapons** | .. | | | | **935** |
| Submarines/ surface ships/ naval aircraft | .. | Land attack cruise missiles, sea-launched cruise missiles, anti-submarine weapons, surface-to-air missiles, depth bombs, torpedoes | | | 935 |
| Air force weapons | 260 | | | | **500** |
| *Tu-22M3 (Backfire-C)* | 60 | 1974 | .. | 3 x ASMs, bombs | 300 |
| *Su-24M/M2 (Fencer-D)* | 70 | 1974 | .. | 2 x bombs | 70 |
| *Su-34 (Fullback)* | 120 | 2006 | .. | 2 x bombs | 120 |
| *Su-57 (Felon)* | - | [2024] | .. | [bombs, ASMs] | .. |
| *MiG-31K (Foxhound)* | 10 | 2018 | .. | 1 × ALBM | 10 |
| **Air, coastal and missile defence** | *886* | | | | **387** |
| *53T6 (SH-08, Gazelle)* | 68 | 1986 | 30 | 1 × 10 kt | 68 |
| *S-300/400 (SA-20/21)* | 750 | 1992/2007 | .. | 1 × low kt | 290 |
| *3M55/P-800 Oniks (SS-N-26 Strobile) 3K55/K300-P Bastion (SSC-5 Stooge)* | 60 | 2015 | >400 | 1 × [10-100 kt] | 25 |
| *SPU-35V Redut (SSC-1B Sepal)* | 8 | 1973 | 500 | 1 × 350 kt | 4 |
| **Army weapons** | *164* | | | | **90** |
| *9K720 Iskander-M (SS-26 Stone), 9M728 Iskander-K (SSC-7 Southpaw)* | 144 | 2005 | 350 | 1 × [10-100 kt] | 70 |
| *9M729 (SSC-8)* | 20 | 2016 | 2 350 | 1 × [10-100 kt] | 20 |

Source: H.M.Kristensen, M.Korda, Russian nuclear forces – SIPRI Yearbook 2022, subsection II, Section 10.

agreement with Iran on the construction of a drone production plant on Russian territory with an annual capacity of about 6,000 units. The total period of full localisation of production could well be 2-3 years, but one can already observe the use of Iranian drones with Russian warheads. At the tactical level, Russia actively uses Chinese *DJI (Mavic 3)* and *Autel* and also increases production of its own UAVs, in particular, *Zastava* (a copy of the Israeli *Bird Eye 400*), *Forpost* (a copy of the Israeli *Searcher Mk II*), *Orlan-10*, *Lancet* and its cheaper equivalent with a range of up to 25 km. The production rate is 50-100 units per day.

### *Ukraine*

According to various estimates, the ratio of Russia-Ukraine military equipment losses is approximately 3/1. As noted above, there is a certain parity in the number of weapons on the frontline. However, a purely quantitative comparison of forces is rather provisional and does not answer the question of how successful the offensive campaign will be, as it does not take into account the strategy and tactics of warfare or the methods of weapons use. In this regard, it is more appropriate to talk about the sufficiency of forces and means to perform the relevant typical tasks and achieve certain results. The main groups of interrelated tasks to be performed by the Armed Forces of Ukraine during the summer-autumn campaign are as follows:

- Engaging in active defence and deterring Russian counterattacks in certain areas of the front. The main types of combat action include:
  - ✓ counter-battery artillery fire;
  - ✓ exchanging assault operations in certain areas of the front;
  - ✓ holding positions;
  - ✓ striking the enemy's command and control and logistics systems at a tactical and operational depth.
- Breaking through of the enemy's echeloned, well-equipped defences; capturing bridgeheads to deploy and build up the offensive group of forces and their logistical support. The success of this task will depend on the Ukrainian Armed Forces' ability to:
  - ✓ cross large and dense minefields and pierce well-equipped and fortified defence lines;
  - ✓ inflict fire damage to enemy groups at tactical and operational depth;
  - ✓ advance through mined terrain under enemy fire deep into the Russian troops' defensive order;
  - ✓ ensure reliable air and flank cover for the advancing troops;
  - ✓ prevent the approach of enemy's operational reserves by destroying them in places of concentration and on routes of advance;
  - ✓ ensure timely replenishment of losses and throw own reserves into the battle;
  - ✓ move up logistics;
  - ✓ ensure rapid evacuation of the wounded and damaged equipment.
- Bringing operational and strategic reserves into action; manoeuvring forces and means; developing an offensive on a broad front or in several separate directions with the encirclement of enemy groups; liberating and clearing settlements and territories. This will require the availability of:
  - ✓ powerful, highly mobile, fully equipped, and trained formations;
  - ✓ a large number of means of high-precision and area destruction of the enemy troops, reserves, command and control systems and logistics at operational and strategic depth;
  - ✓ engineering equipment to cross minefields, natural and artificial obstacles;
  - ✓ assault units trained to operate in urban settings;
  - ✓ military gendarmerie trained to counter sabotage groups and interact with the population in the de-occupied territories;
  - ✓ reserves to replenish losses.
- Defeating Russia's strategic reserves and restoring the state border of Ukraine. One

should be prepared for the possibility of Russian troops holding off the Ukrainian offensive in certain areas and launching a counter-offensive using strategic reserves. Under these conditions, the need for artillery, tanks, army aviation, and long-range weapons is growing.

Effective intelligence, air defence and support, and electronic warfare will be vital at all stages of the offensive campaign. No less important is covering large cities and strategic infrastructure from missile and drone strikes.

Along with the skill of the Ukrainian Armed Forces' high military command, operational and tactical commanders and non-commissioned officers, training and courage of personnel, coherence and interaction of units and formations, other important conditions for implementing the above capabilities and achieving necessary results are timely accumulation and replenishment of sufficient reserves of manpower, weapons, ammunition, military and special equipment. Ukraine's sources for creating and replenishing the necessary mobilisation and military-technical potential are the country's own, currently limited, capabilities of the state and society, and invaluable assistance from partners. Moreover, weapons are needed not only before the start of the offensive, but also during the entire campaign to replenish losses.

### *Tanks*

Taking into account losses, supplies from abroad and captured equipment, the AFU had about 1,100 tanks in service in early July 2023, including 1,000 Soviet-made T-55, T-64, T-72, T-80, T-90 of various modifications, and about 100 Western vehicles (*Challenger, Leopard*). By the end of the year, Western partners are expected to deliver about 300 more tanks (T-72, *Abrams, Challenger, Leopard, Leclerc*). Poland, the Czech Republic, Slovenia, the United Kingdom, Germany, the United States, Denmark, Spain, Norway, the Netherlands, and France have already provided or announced their intention to provide Ukraine with Soviet- and Western-made tanks. Germany's *Rheinmetall* plans to open an armoured vehicle production plant in Ukraine within 12 weeks with a capacity of about 400 vehicles annually, but its products will hardly be available by the end of 2023.

Thus, the current Ukraine-Russia ratio in tanks is approximately 1/0.9. Taking into account the quality of weapons, this proportion is further improved in favour of Ukraine, but the balance may change due to unpredictable losses in the course of the offensive.

### *Armoured vehicles*

During the full-scale war, Ukraine received about 7,000 units of heavy and light armoured vehicles — both Soviet and Western models — from the allies. Key suppliers of Western armoured vehicles are the United States (*M113, M1117, Bradley M2, Cougar, Stryker, MRAP M1224 MaxxPro, HMMWV*), the United Kingdom (*Land Rover Defender, FV103 Spartan, Mastiff*), Canada (*Senator APC*), Turkey (*MRAP BMC Kirpi, Otokar Cobra II*), Germany (*Grenzschutzfahrzeuge, Marder, MRAP Dingo*), Poland (*Rosomak*), Italy (*Iveco LMV*), Australia (*Bushmaster PMV*), France (*VAB, AMX-10P, ACMAT Bastion*), Sweden (*CV-90*), and Finland (*Sisu XA-180*). Also, Ukrainian troops captured more than 1,000 armoured vehicles from the enemy.

Before the war, Ukraine had own facilities for producing domestic armoured vehicles, including *BTR-4 Bucephalus and BMP-U* (which are now virtually out of production), armoured cars *Novator, Varta, Kozak-2, Kozak-2M1* and *Kozak-7* (which are being supplied to the Armed Forces and the National Guard in small batches, including through volunteer organisations). According to the Minister for Strategic Industries, it is planned to increase production of tanks and armoured vehicles in 3-6 months. Taking into account losses, the AFU may have about 7,500 armoured vehicles in service. By the end of the year, more than 1,200 APCs/IFVs are expected to be delivered by Western partners.

The current Ukraine-Russia ratio in armoured vehicles is approximately 1/1.2. However, the Western aid packages are dominated by light armoured vehicles that are hardly suitable for current offensive operations.

Instead, Ukraine is in dire need of APCs/IFVs such as the American *Bradley*, German *Marder* and Swedish *CV-90*.

### *Artillery*

As of the end of June 2023, Ukraine received more than 1,000 pieces of artillery of various calibres and missile systems from Western partners. The main suppliers are the United States (*L119, M777, M109, MRLS M270, M 142 HIMARS*), the United Kingdom (*AS-90, FH70*), Germany (*PzH 2000*), France (*Caesar*), Sweden (*Archer*), Poland (*AHS Krab*), Slovakia (*Zuzana 2*), the Czech Republic (*RM-70 Vampire, Dana M2*), and Croatia (*RAK-SA-12*). By the end of the year, it is planned to supply about 200 additional units of field artillery and 170 howitzers. More than 200 pieces of artillery were captured from the enemy.

In early 2023, Ukraine started mass production of its own *Bohdana* self-propelled artillery system and mortars. In early July, the Kramatorsk Heavy Machine Tool Plant signed an agreement with Slovakia's *Konstrukta Defence* to jointly develop 155-mm howitzers.

At the moment, Russia probably has a numerical advantage in field artillery and mortars, but due to the uncertainty on losses, it is impossible to determine the ratio. It is also very difficult to estimate the ratio of howitzers and MLRS. However, the qualitative characteristics of these weapons systems give Ukraine an advantage, as evidenced by the Russians' own reports of huge artillery losses. The quantitative Ukraine-Russia ratio in artillery and MLRS is approximately 1/1.3, but the qualitative ratio is on Ukraine's side. Nonetheless, the realisation of the quantitative advantage in artillery largely depends on the availability of shells and their effectiveness.

### *Ammunition*

At present, Ukraine's main source of artillery ammunition is Western partners that provide both NATO and Soviet calibres. The partners' defence economies have encountered the problem of limited capacity to supply ammunition to Ukraine and replenish their own stocks. To address this problem, the United States intends to double its monthly production of 155-mm shells to 24,000 by the end of 2023 and increase it six-fold over the next five years. The EU has agreed plans to increase production and supply of ammunition to Ukraine by 1 million ammunition rounds by the end of 2023. The supply of cluster munitions for 155-mm howitzers from the US will have a positive impact on solving the ammunition shortage problem and improving the Ukrainian forces' ability to destroy the enemy.

According to the Minister for Strategic Industries, Ukrainian enterprises have finally established production facilities and are already supplying the AFU with mortar and artillery shells, as well as domestic *Stugna-P* anti-tank systems. In particular, Ukrainian Armour has resumed mass production of 60-mm mortar rounds and has already supplied the AFU over 100,000 rounds of ammunition. The state-owned Ukroboronprom has launched mass production of 82-mm mortar rounds at the facilities of one of the NATO member states. Therefore, there are prerequisites for overcoming the so-called «shell hunger» during the Ukrainian forces' summer and autumn offensive campaign.

Due to the extremely limited capacity of the domestic defence industry to produce tactical missiles such as *Borysfen*, *Sapsan* and *Neptune*, the AFU have high hopes for long-range missiles from their Western partners. For political reasons, Ukraine has been denied the supply of such missiles until recently. However, the arrival of the UK's *Storm Shadow* and France's *SCALP* cruise missiles has opened a window in the ban on such supplies and will encourage other countries to join this initiative. The possibility of supplying ATACMS missiles to Ukraine is currently being discussed in the Biden administration.

### *Aviation*

Ukraine is losing out to Russia in terms of the number of aircraft. The Ukrainian forces' Su-27 Flanker-B and MiG-29 Fulcrum fighters, many of which have been donated by Eastern European countries, including as spare parts, are inferior in quality to Russian Gen 4+ aircraft. A similar situation is with Ukraine's helicopters, the vast majority of which are Soviet-made. The few Western-made helicopters, including British *Westland WS-61 Sea King* and American *UH-60 Black Hawk*, cannot change the

situation. Aviation is known to be a critical factor in influencing the situation on the battlefield, especially during the preparation and conduct of an offensive campaign, determining its pace, and most importantly, minimising the loss of manpower and ground equipment. Ukraine is in dire need of aviation to carry out long-range strikes, prevent the enemy from seizing air dominance, and cover troops from air strikes. However, the promised aircraft from the US to other countries of the anti-Russian coalition can be expected no earlier than the end of 2023 — beginning of 2024.

The situation with UAVs is somewhat better. Since the start of active hostilities, Ukraine has received about 5,500 UAVs from partners, including about 2,500 multipurpose/reconnaissance drones, more than 3,000 kamikaze drones, and more than 50 strike drones. It is planned to supply more than 500 additional UAVs of various types. The key suppliers are Turkey (*Bayraktar TB2*), the United States (*Phoenix Ghost, Switchblade, Autel EVO, Quantix Recon UAS*), Australia (*DefendTex D40*), and Poland (*Warmate*). Ukraine critically lacks long-range reconnaissance and strike drones such as *Reaper* and *Grey Eagle*.

Ukraine is making great efforts publicly and privately to arrange production and supply of UAVs to its military. According to the Minister of Digital Transformation, as of June 2023, the UAV production in Ukraine in some categories has increased ten-fold and sometimes hundreds of times compared to last year. The regulatory framework has been simplified, and initiatives have been introduced that significantly reduce the time to develop, manufacture and transfer products to the military. In total, more than 100 drone manufacturers operate on the market; 40 Ukrainian UAVs of various types have passed the commissioning procedure and are receiving government contracts, including *Vidsich* with a range of 30-40 km and a payload of 2-4 kg, and *Yatagan* with a range of up to 15 km and a 1.5 to 2-kg warhead. The production of the *Kyivska Rus* with a range of up to 700 km and a 16-kg warhead has begun. The Ukrainian Armed Forces receive many drones from volunteer organisations. The main challenges are limited financial resources, limited ability to integrate production facilities due to the risk of damage, and poor coordination between government and volunteer organisations.

### *Air defence*

*Air defence systems provided by Western partners (Patriot, NASAMS, IRIS-T, Aspide, SAMP-T, Hawk, Crotale, Stormer, Gepard, Avenger, Stinger, Starstreak, Mistral*) have boosted Ukraine's air defences, which were initially armed with outdated Soviet models. In June 2023, air defence forces destroyed 74% of the enemy's cruise missiles and almost 60% of strike drones. However, the AFU losses, the destruction of infrastructure and civilian casualties in the frontline regions from missile and bomb attacks indicate that available weapons are insufficient to ensure a reliable multifunctional, layered system of protecting troops and civilian objects across Ukraine from air strikes. Given the objectives of the summer and autumn offensive campaign, the AFU need both long- , medium- and short-range momile air defence systems; of similar importance are means of destroying aircraft at airfields and missile bases in the enemy's operational rear and on Russian territory.

### *Special equipment*

An offensive campaign's success largely depends on how troops are equipped with engineering, demining, communications, command and control, electronic warfare, repair, medical and sanitary, and other equipment. As with many other categories of military equipment, the Ukrainian defenders have to rely on the West's help. However, during and after the Cold War, many specialised equipment was produced in the West in small batches to meet the current needs of national armed forces. Therefore, the existing Western countries' arsenals are unable to meet all the needs of the AFU.

The Ukrainian Armed Forces have the greatest demand in counter-battery radars (*AN/TPQ-36, 64, TRML-4D, COBRA*); repair and evacuation vehicles (*M88A2 Hercules, CRARRV, M984A4 HEMTT, M1089A1P2*); armoured support vehicles (*Bergepanzer 2, 3*),

armoured engineering vehicles NM189 (*Ingeniorpanservogn, Pionierpanzer 2A1 Dachs AEV*); demining vehicles (*Leopard*-based), demining systems (*M58, Minröjningsorm*).

One of the ways to mitigate this problem is to produce new or repair damaged equipment, either on one's own or in cooperation with European companies. Since the onset of the war, public and private companies and the Ukrainian volunteer movement alike have developed an extensive network of production, repair and return of special equipment. In doing so, they use non-standard approaches, including conversion of damaged own and captured tanks and armoured vehicles with irreparable weapons systems into mine sweepers, repair and evacuation vehicles, and shielded vehicles.

**The goals of Ukraine's offensive campaign are to liberate all the occupied territories, inflict losses on Russia that would render it impossible for it to aggress again for a long time, and at best, start the process of Russia's disintegration.**

**Russia still has a rather strong mobilisation and military-technical potential to last for a while. The ongoing depletion of replenishment sources is to some extent compensated by the concentration of forces on the most important areas of combat operations. If the current Ukrainian offensive does not reach a strategic turning point, Russia will be able to accumulate forces, reinforce defences in the occupied territories and turn the war into a protracted one.**

**Some Western partners' political circles pin certain hopes on a decisive, fast-paced offensive by the Ukrainian Armed Forces. Accordingly, there are questions and even complaints about the slow pace of the Ukrainian forces' current offensive. But given the current balance of power, a single, even decisive offensive will almost definitely fail to achieve the desired result — a complete victory over Russia — and will be accompanied by huge Ukrainian losses.**

**Ukrainian forces' offensive campaign will consist of a set of offensive and defensive operations interconnected in terms of goals, resources, and time. Their pace and outcomes will largely depend on the military and technical assistance received from Western partners, primarily long-range missiles and aircraft to support the advancing forces and cover them from air strikes. The delay in providing such equipment is due to differences in how Ukraine and some of its Western partners see the «victory over Russia».**