

CURRENT STATE OF THE RUSSIAN FEDERATION'S ECONOMY AND ITS IMPACT ON MEETING THE STATE'S MILITARY NEEDS

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Despite numerous expert conclusions and forecasts regarding the systemic weakness and degradation of the Russian economy, as well as Russia's unpreparedness to wage a prolonged war of attrition, reality demonstrates the Kremlin's ability not only to continue the war but also to increase its military potential. This requires improving analytical approaches with a focus on identifying the aggressor country's reserves that are most dangerous for Ukraine and the world.

There are a number of markers and indicators (including hidden ones) for determining the state of the Russian economy that require generalization and study. It is proposed to include among the key conclusions primarily the factors influencing the Russian economy in terms of its sustenance, especially those that the efforts of the world community can reduce or even nullify. This work is devoted to the search for Moscow's main sources of war financing and ways to neutralize them.

At first glance, Russia's economy is noticeably shaky, there are signs of a decrease in some critical (for war) productions, a decline in the technological level of weapons and the preparedness of almost all human resources involved in the war (this is not about the demotivation to fight of a significant part of Russians, but about a noticeable decline in the skills of specialists of various functions, obviously due to a sharp increase in deficits) and other indicators that should be examined in more detail.

On the other hand, Russia demonstrates a restructuring of the economic, social, psychological, and all other components of human existence to meet the needs of a large-scale, long-term war, and the effectiveness of this restructuring is recognized by various professional institutions and specialized organizations. The contradictory nature of these conclusions regarding Russia prompts an analytical comparison of the maximum number of reliable

indicators that can serve as markers and allow determining the level of resilience of the country's economy.

In this context, it is worth mentioning some conclusions, in particular, from analysts at the Center for Strategic and International Studies (CSIS), that Russia is ready for a protracted war scenario and may attack NATO countries in the next two to eight years. Among other things, CSIS emphasizes: *Russia has suffered staggering losses in Ukraine, but has "almost completely restored its military structure" to pre-war levels thanks to national mobilization and a war economy supported by China, Iran, and North Korea.* However, let's try to identify the markers and the level of their influence.

General Assessment of the Russian Economy in the Context of War Expenditures

The May report from the Kyiv School of Economics provides well-founded conclusions from relevant experts that "Russia is unlikely to face serious constraints in the current economic environment", and its ability to finance the war against Ukraine is improving. As before, Russia's economic pillar remains profits from the sale of oil and petroleum products on the world market. KSE experts assessed the current situation as conducive to the growth of these profits, with revenues increasing by 22% during the first 4 months of 2024 compared to 2023. The economists identified the reasons for Russia's economic stability: rising oil prices on the world market (in April, a barrel of Brent crude cost an average of \$90) and the weakness and ineffectiveness of sanctions against Russian oil exports. As a result, budget revenues from oil and gas exports increased by 82%. *Consequently, the state of the economy and its annual prospects allow Russia to confidently finance the war, increase military potential, and raise the stakes in blackmailing the West.*

Economists state that the West has lost to Russia in energy sanctions. In 2022, Russian exports reached \$591 billion, a record high in the history of the Russian Federation. In the first half of 2023, Russian exports fell to \$206 billion compared to \$306 billion for the same period in 2022 – a 30% decrease. However, sanctions only deprived Russia of excess profits and returned it to 2021 levels. Overall, Russian oil flows simply shifted to China, India, the UAE, and Türkiye . It's worth noting that even in 2023, Europe itself did not completely abandon Russian energy – oil flowed through one branch of the Druzhba pipeline, and gas imports – both pipeline and liquefied – even increased.

Economic analysts noticed one significant nuance: Russia began exporting more oil and significantly fewer high value-added goods, such as automobiles, railway transport, and furniture. According to experts, this will eventually affect the competitiveness of the Russian economy and make it more dependent on commodity prices. For the world, this is a clear signal: Russia can be tamed by powerful mechanisms of influence specifically on energy exports. *Overall, to stop the Kremlin's aggression, a harsh blow to foreign currency earnings is needed – this was not achieved by June 2024.*

The appointment of Andrei Belousov as Russia's Minister of Defense in May 2024, who is considered an economist advocating strict state regulation of the economy, indirectly indicates the insufficiency of financial resources and the actual transition to total control and full subordination of the economy to war. With this decision, the Kremlin leader demonstrated concern not so much for 2024, but fear for 2025 and beyond – this was done against the backdrop of the beginning of a review of Western sanctions policy primarily towards Russia and China. In his speech to the Duma, the new minister directly stated his intention to strengthen control over weapons prices, production and development, as well as capital construction costs. It's important to note that the issue of controlling weapons prices and their development in Russia appears for the first time during Putin's era. Among other things, this indicates not only the insufficiency of weapons themselves but also dissatisfaction with their quality, as well as the results of current developments with enormous financial costs.

Experts define the determination of prices for weapons and military equipment by the customer and the coercion to fulfill the order as a Soviet-type planned economy, which is considered extremely dangerous even in professional circles within Russia itself. However, the authorities can apply an already created lever – in September 2022, Russia introduced 10-year punishments in the military-industrial complex for non-fulfillment, violation of contract terms, and even refusal to fulfill it. These measures are also intended to reduce the level of corruption, which has been sky-high in recent years (as evidenced, among other things, by the arrests of top military officials in 2024).

Since Belousov also announced "ensuring the full integration of the armed forces' economy into the country's general economy", it becomes clear: he plans to use the punitive apparatus against ordinary citizens. This is an effective Soviet-Stalinist principle, and the resilience of human resources, although not directly related to the state of the economy, should be taken into account here due to its direct impact on the state's ability to wage war and maintain military capabilities in conditions of unprecedented decline in living standards and increased risks of death in war. And this threshold of resilience in Russia is extremely high, at least several times higher than in the democratic societies of Western democracies. Therefore, the conclusion of the International Monetary Fund (in May 2024; over the past 10 years, Russia's GDP per capita, according to the IMF, decreased by 16%) that in the coming years Russia will fall below Turkmenistan in terms of living standards can be disregarded and not considered a critical criterion. ***Thus, Russia has a significant reserve in supporting the economy through the oppression of the population.***

Thanks to the aforementioned, a sharp increase in overall maintenance costs and a significant increase in the army became possible. At the expanded board of the Russian Ministry of Defense in December 2022, it was announced that the number of military personnel in the Russian Armed Forces would increase from 1.15 million to 1.5 million, of which 695,000 should be contract soldiers. As a result, as of October 2023, at least 123 new military units

were created in Russia. Researchers from the Conflict Intelligence Team emphasized that their actual number could be even higher.

Russian President Putin, during his so-called "direct line" in December 2023, stated that the number of Russian troops "in the zone of combat operations against Ukraine" reaches 617 thousand people. Moreover, on December 1, Putin increased the number of positions in the Russian Armed Forces by 170,000, bringing it to 2,209,130 positions, of which 1,320,000 are military personnel. All these measures indicate not just a frenzied increase in military spending, but a confident course towards a long, exhausting war. Already in June 2024, the Russian dictator reported that almost 700 thousand Russian military personnel are fighting on the territory of Ukraine.

According to the new Defense Minister A. Belousov, "defense expenditures have already exceeded 6.7% of the country's GDP". That is, if according to Rosstat, Russia's GDP is about 2.24 trillion dollars, then **Russia is spending 150 billion dollars on the war**. It's worth noting that for 2024, a record 121 billion dollars is officially allocated in the "Defense and Security" line item in Russia, which is one-third of all country's expenditures. But there are also hidden costs.

It's not surprising that for 2024, it's planned to spend 70% more than in 2023. There are approximate calculations indicating that in 2023, Russia spent \$23.4 billion on monetary support (salaries) for the military and \$31 billion in compensation for the wounded and families of the deceased. That is, in total, in 2023, approximately \$53.5 billion was spent only on "military social expenditures", while in 2024, \$33.5 billion is allocated for all "Armed Forces of the Russian Federation". This is precisely about the hidden costs of war, which continue to grow rapidly. In addition, in 2024, Russia carefully concealed the real ratio of expenditures on the army and the Ministry of Internal Affairs in the article "Other issues in the field of national defense". This article was increased 11 times compared to 2023. Calculations by specialists indicate that in total, almost 40% of the budget will be spent on power structures in 2024.

Interestingly, the draft budgets for 2025 and 2026 provide for approximately the same expenditures as for 2024 (Russia's budget for 2024 provides for \$412.5 billion in government spending and a budget deficit of \$9.25 billion). This is \$387.9 billion and \$400.4 billion, respectively. And this is a clear indication of the Kremlin's intentions to continue the exhausting, prolonged war in Ukraine.

Russia has entered a stage where everything is subordinated to the war economy, that is, to supporting the war. It's worth paying attention to the statement of Russian oppositionist Ilya Ponomarev on this matter (June 15, 2024): "Putin always appoints one of the technocrats as prime minister because he understands that a competent person who manages the economy is needed there. He even appointed a defense minister from the same breed". And the question is not that in June 2024, the Russian economy has a significant margin of safety. But that it is

simultaneously the weakest link of the current regime. First of all, Russian corruption, the obvious technological degradation of the military-industrial complex, as well as the creativity of the Ukrainian army and timely decisions of Ukraine's Western allies can negatively affect the state of the Russian economy. In 2024, Ukraine's partners not only expanded options for arms supplies (to not-so-young but still effective ballistic missiles and Western-made aircraft) but are also reviewing sanctions policy. ***And although these Western weapons will not provide revolutionary breakthroughs for the Defense Forces, they significantly increase Ukraine's resilience and open a "window of opportunity" in creating Ukrainian weapons and joint weapons - within the framework of military-technical cooperation.***

Peculiarities of Russia's International Trade and Weakness of Sanctions

Of course, Russia's most significant trump card is oil and gas. But there are also a number of other profitable industries. Moreover, not all Russian goods have been sanctioned.

In addition to civilian and food products, there are several exceptions: platinum, non-ferrous metals, diamonds, and some steel products. Western countries, mostly the EU, still buy all of these. Calculations in September 2023 showed that Russia annually earns almost \$22 billion from such products. The later introduction of an embargo on diamonds will not significantly reduce this income, as their annual share was about \$1.5 billion. At the same time, copper, aluminum, nickel, and platinum together accounted for \$14.5 billion.

Western firms purchased metal titanium worth hundreds of millions of dollars from the Russian company "VSMPO-AVISMA" even after February 24, 2022. Titanium is vital in the production of both commercial and military aircraft. As a result, "VSMPO-AVISMA" was not sanctioned by the US or EU; only Ukraine and Canada imposed sanctions. In September 2023, the US Department of Commerce finally introduced export controls on VSMPO. However, this concerns the ban on exporting goods to Russian companies, not their titanium to the US.

In 2022, VSMPO exported about 15,000 tons of titanium worth \$370 million, with Germany, France, the US, and the UK leading the list of buyers. Data for 2023 is limited - not all transactions between VSMPO and Western firms are present in the databases. However, the tracked operations amount to \$345 million.

Supplies of Russian titanium to Airbus alone increased to \$24 million in 2022. The volume of purchases compared to the previous year grew by 940%. The Safran Group (engine and chassis production) in the same year increased purchases of VSMPO products by \$8.6 million - to \$20 million. Imports of Ural titanium to Rolls-Royce amounted to \$6.7 million (only \$5 million in 2021). The threat of closing titanium exports is a strong "whip" for Moscow. However, they do not dare to use it.

Many countries depend on Russian nuclear energy and nuclear fuel. So much so that connections did not break even in 2024. For example, Rosatom was freely involved in the construction of a nuclear power plant in Türkiye, and even in March 2024, Rosatom, together with the French state company Framatome, worked on the production of nuclear fuel. It was about supplying reactors that produce electricity for 100 million residents of Eastern Europe: Bulgaria, the Czech Republic, Hungary, and Slovakia still use Russian technologies. Production was proposed to be organized at the Framatome plant in Lingen (Germany). In 2023, Framatome created a joint venture with the Russian company "TVEL" (a subsidiary of Rosatom) and is the world's largest supplier of nuclear fuel.

Although Western countries have mostly abandoned Russian energy sources, the refusal was not total. The slowness of Western decisions ensured a transition to new buyers, particularly India, China, and Türkiye. For example, India in 2023 bought two million barrels every day. To influence this, Western leaders tried to limit prices – through sanctions against carriers. Before 2022, 80% of oil and 90% of petroleum products from Russia were exported by tankers of companies from the EU, G7, or Norway. Russia's reaction was to buy up tankers to avoid dependence on Western shipowners and insurance companies. Experts point to a "shadow fleet" of more than a thousand ships – more than half of Russia's oil exports were transported by this fleet, registered in Gabon, Palau, and Panama. In the fourth quarter of 2023, 98% of oil was exported from Russia in violation of the price cap.

At the end of 2023 and the beginning of 2024, the US imposed sanctions against shipowners and specific tankers carrying Russian oil. Thus, the Russian company "Sovcomflot" fell under sanctions, and its four dozen tankers drifted empty at sea for a long time. However, this is only evidence of a positional war that Moscow has managed to win so far.

It's worth noting that as part of the revision of sanctions policy, the US and its allies began to improve the system of influences on Russia. For example, the Moscow Exchange was forced to announce the cessation of trading in dollars and euros due to the introduction of new sanctions by the US Treasury in June 2024. Following the US, the UK also imposed sanctions against the Moscow Exchange, the National Clearing Center, and the National Settlement Depository, as reported on the British government website.

Another position is the presence of powerful big business players in the Russian market. For example, the Austrian bank Raiffeisen alone paid 560 million euros into the Russian budget in 2022. A significant part of this amount could go to the purchase of missiles or the payment of salaries to Russian military personnel. Experts have calculated that taxes of international companies that remain in Russia amount to \$18 billion a year, which could be enough to fully finance two months of war in Ukraine (<https://www.epravda.com.ua/publications/2023/06/23/701487/>).

Experts cite an example where the Hungarian OTP bank and Austrian Raiffeisen issue preferential loans to the military and credit holidays, motivating them for war. And the French

supermarket chain Auchan supplied products to Russian military at the front. In turn, American Schlumberger serviced Russian oil and gas fields. The business of many Western companies in Russia remained unpunished.

Influence of Russia's Foreign Partners

"Asia's commercial potential helps sustain Russia's military economy", wrote The Economist at the height of the continental war.

There's no doubt that China's support for Putin's regime in Russia has strategic and defining importance. Even small fluctuations in this support cause hysteria in Russia. This was the case, for instance, after China introduced restrictions on money transfers from Russia in May 2024 - due to fears of secondary sanctions from the US and EU.

The West's sanctions policy targeting Russia's partners began to slowly improve only from autumn 2023. Attention was mainly focused on China, but the US acted selectively at that time.

On November 2, the Office of Foreign Assets Control (OFAC) of the US Treasury imposed new sanctions against hundreds of individuals and legal entities in Russia, China, Türkiye, and the United Arab Emirates involved in the production of Russian weapons used against Ukraine.

In December 2024, the US Department of Commerce and Japan's Ministry of Industry agreed to cut China off from powerful semiconductor technologies. The United States has already imposed sanctions on over a hundred Chinese organizations involved in trade with Russia in dual-use goods and strengthened export controls to prevent such products from reaching Russia.

The EU in 2024 began to impose restrictions and withdraw high-tech companies from China. For the first time, the EU approached sanctions against Chinese companies specifically for their assistance to Russia, and in June, the union came close to introducing additional duties of up to 25% on Chinese electric vehicles.

The UK stopped selling semiconductors to China from the beginning of 2024, and earlier several countries, including the US, Netherlands, and Japan, agreed to cooperate to limit China's access to high-tech semiconductor technologies.

Therefore, China's intention to focus on its own full cycles in weapons production is more likely a consequence of failures in foreign policy than a conscious decision aimed at gaining certain advantages in the future.

Finally, in June 2024, US Deputy Treasury Secretary Wally Adeyemo, who is responsible for sanctions in the US government, noted that Russian intelligence is looking for components

for military production worldwide. In particular, it's about microelectronics and microchips for missiles and drones. Russia manages to find most of the dual-use goods for its military-industrial complex in China. According to Adeyemo, Russia can produce weapons on the scale it needs for the war against Ukraine only because it receives dual-use goods from China. This is likely a significant exaggeration (confirmations will be provided below), but this statement became the basis for a call that the US and European allies should put Russia's main partner – China – before a choice: to maintain economic relations with the Western world or to sell dual-use goods to Russia. "Companies and individuals in China who sell these goods to Russia must make a choice: either do business with our alliance, which represents 50% of the world economy, or they can continue to do business with the Russian military complex", said the Deputy Treasury Secretary. This means only that for the first time since the beginning of the full-scale invasion, the US went on an open attack (in practical terms) and demanded joint actions with Europe. China had not faced such a level of pressure until June 2024, which was supplemented by NATO. Namely, NATO Secretary General Jens Stoltenberg, immediately after the end of the peace summit in Switzerland, announced consultations within the bloc on bringing the nuclear arsenal to combat readiness – he especially emphasized the growing threat not only from Russia but also from China. These are new, more stringent attempts by the Western bloc to force China to abandon support for the Kremlin. In the summer of 2024, Beijing's positions looked too strong to be forced to change its course. However, consolidated actions of the West can achieve positional success.

The same applies to Iran – although it supplied drones to Moscow, it refrained from transferring ballistic missiles. On condition of anonymity, Ukrainian military intelligence in June 2024 expressed confidence that Iran, like China, would not resort to direct arms supplies.

However, North Korea became another major and unpredictable partner of Russia from 2023. According to the South Korean Ministry of Defense, as of June 2024, at least ten thousand sea containers departed from North Korea to Russia. These containers may contain up to 4.8 million artillery shells. In addition, North Korea also transferred dozens of ballistic missiles to Russia for use in the war against Ukraine. In exchange for ammunition, Russia transferred technologies to North Korea that will help it deploy a network of spy satellites, as well as conventional weapons such as tanks and aircraft.

The Main Intelligence Directorate of the Ministry of Defense specified that as of June 2024, North Korea in particular transferred to Russia about 900,000 122 mm ammunition, about 700,000 152 mm, about 100,000 122 mm ammunition for MLRS, up to 2.6 million 120 mm mines and up to 2.3 million 82 mm mines. The estimated total figure received by the enemy is up to 6.6 million different types of ammunition, among which there is primarily a large number of mines.

An alternative path for Moscow was the search for new re-export opportunities through countries that support partnership. *The business environment in Russia proved to be sufficiently resilient for such deals.* For example, existing warehouses and established

logistics in Kazakhstan allowed importing prohibited goods into Russia as well. *The same components of microelectronics were supplied to the Russian military-industrial complex through Türkiye, China, Kyrgyzstan, Kazakhstan, and Uzbekistan.*

In 2023, Western media indicated that Kazakhstan and Armenia were buying microelectronics, which then ended up in Russia. This is not about support for supplies by the governments of such countries, but about the covert use of private companies, civilian enterprises, which allows this to be done. In April 2023, The New York Times, citing various sources, claimed that, for example, Armenia in 2022 imported 515% more chips and processors from the US and 212% more from the EU than in 2021. Then 97% of this production was exported to Russia, that is, such re-export took place, and the American side learned about it. The same was said about other countries. The German publication Der Spiegel reported that there was a boom in sales of goods to countries neighboring Russia, and the publication hinted at circumventing sanctions.

In May 2023, the G7 was to consider the possibility of introducing a total ban on exports to Russia, but at the last moment, the G7 countries refused to consider this issue.

Secondary sanctions from the US had varying success. For example, India, due to fears of secondary sanctions, postponed the issue of importing Russian S-400 "Triumph" systems for several years. But at the same time, it supplied Russia with bearings necessary for its military-industrial complex, arguing that this is non-military production.

Another format of war support is the recall, buyback, or exchange of weapons from some countries of the world. For example, analysts from Ukraine Weapons Tracker proved that Russia uses 120-mm artillery mines from Myanmar. Most of the markings on the ammunition were erased, but the 120ER mines could be identified due to the characteristic shape of the tails, residual markings, and fuses. In turn, in 2022 it became known that the Myanmar Air Force accepted the first two Russian Su-30SME fighters.

In general, it can be concluded that from the second half of 2023, the US and its allies in Europe began a gradual offensive in the international arena, and all the goals of this offensive were aimed at weakening the economy of Russia's partners and Russia itself. There are signs that further intensification of these efforts can lead to more significant results than the Western bloc had in 2022-2023. The new wave of pressure from the West turned out to be much higher than before – in the summer of 2024, it began to gain strength.

Conclusions and Recommendations

As of June 2024, Russia's economic state allows it not only to conduct a costly war in 2024 but also to prepare for large-scale military campaigns in 2025 and 2026, which may include strategic offensive operations. The main negative phenomena in Russia are reflected in the standard of living of the population and the gradual decrease in the technological level of almost all types of weapons. At the same time, the "human resource" has a significant margin of strength, which allows compensating for the lack of technological advantages over Western-made weapons through covert mobilization.

Russia managed to put its military-industrial complex on a war footing by the end of 2022. In fact, there was a restart and restructuring of the entire economy for a long-term war. This was achieved primarily due to the slow introduction and weak content of Western sanctions, the lack of strong international control over their implementation, and the insufficiency of sanctions as a deterrent mechanism.

Overall, Western sanctions proved to be less decisive and containing many compromises. The authoritarian regime in Russia had time and opportunities to respond operatively and adapt to sanctions; Russia's adaptive capabilities were underestimated. The West still fears negative consequences from harsh sanctions, and the intention of G7 countries to consider in May 2023 the possibility of a complete ban on exports to Russia (except for food and medical products) was postponed indefinitely. However, Western leaders seem to have begun to realize that delaying complex decisions leads to Russia's gain, including through faster mobilization of industrial capacities. In general, in converting the military-industrial complex to the level of modern warfare needs, Russia is 1.5-2 years ahead of Western bloc countries.

An important factor influencing Russia's economy was the revision of sanctions policy principles by the US, UK, and EU, and the introduction from November-December of an improved mechanism of influence on Russia, including through joint efforts in economic deterrence and political balancing towards Russia's closest allies – China and Iran. Secondly, it's worth noting some successes in creating influences on Russia's secondary partners – Türkiye (through the restoration of military-technical cooperation and, in particular, the F-16 modernization program), India (through promoting India's transformation into a microelectronics production center and the deployment of joint productions, in particular, the latest generation American Stryker armored personnel carriers in rejection of Russian armored vehicles), Saudi Arabia (through political agreements and preferences) and some other countries.

The US and allies also expanded sanctions pressure directly on Russia, using new and creative mechanisms, such as blocking the tanker fleet or imposing sanctions against the Moscow Exchange.

It was the activity of the West, primarily the US, but also the UK and EU countries, against the background of growing internal corruption in Russia's security and defense sector, that

provoked the change of Russia's Defense Minister and the appointment of A. Belousov to this position in May 2024. This indicates the Kremlin leader's intention and desire to improve the system as much as possible, "cleanse" it of at least the most brazen corruption, and finally set the state for a protracted war – one that would ensure the gradual exhaustion and destruction of Ukraine, and not allow the West to play ahead. Now Belousov has already begun thorough and painstaking work with the military-industrial complex – studying the potential of both technological improvements of arms companies and their ability to increase production.

Thus, Minister Belousov's mission, as experts believe, is associated with the best possible provision for the army by the second, most risky half of 2024: namely, with the approach of the US presidential elections and up to January 20, 2025, the time of the inauguration of the new US president. Many, including in Ukrainian military intelligence circles, indicate that there is a high probability that this very period may bring closer the end of the war unleashed by Putin – the Main Intelligence Directorate of the Ministry of Defense believes that under certain conditions this may happen in the spring or mid-2025.

Strengthening secondary sanctions could prove to be an effective mechanism. While the West may not be able to subdue North Korea, influences on China and Iran through increased economic and technological pressure, as well as political balancing, may yield certain results. Moreover, such results could be effective in blocking the group of "third countries" – from Türkiye and Kazakhstan to India and the UAE. It's clear that approaches to problem-solving must be individualized and include reciprocal preferences – such mechanisms are being developed and implemented. The current activity of the US, UK, and occasionally the EU already demonstrates the possibility of creating effective mechanisms of influence on numerous intermediary countries.

At the same time, to effectively counter Russian missile and drone terrorism, Ukraine itself must become an effective and powerful player in the sphere of global sanctions policy. Sanctions can only be effective under conditions of total control. Kyiv can initiate the creation of an international group to search for intermediary companies trading in critical dual-use goods. The creation of an international control system should include not only weapons and their components directly, but also materials, parts, and electronic products. The result could be a significant reduction in the capabilities of the Russian defense industry.

Thanks to the study of trophy samples of Russian weapons and fragments of missiles and UAVs, Ukrainian special services have compiled a list of products critical for Russia. There is experience of cooperation in this area with the governments of several countries (for example, the list mentioned chips and products from the Japanese company Renesas (owner of the American IDT), German Infineon AG, American companies Vicor and AirBorn). But this is not enough. In the future, it is necessary to form an international structure with the task of preventing critical products from entering Russia. It would be logical to actively involve

the governments and special services of countries whose companies willingly engaged in re-export of critical goods, for example, Türkiye, UAE, India, Kazakhstan, Armenia, and others. *Ukraine not only cannot avoid active involvement in this area but must become the initiator of systematic work to eliminate and block all possible channels of Russian import of electronic components, as well as other critical components for the production of weapons and military equipment.*

Control of products through manufacturing companies. Ukraine can increase its own participation in creating mechanisms to control direct manufacturers of individual microelectronic components. After all, since the second half of the 1990s, the State Export Control of Ukraine (created thanks to US investments) has experience of large-scale cooperation with the US, including control over "intangible technologies". Considering that Ukraine is the primary source of obtaining samples of Russian weapons, it is worth taking into account which components of Western production will critically affect production in Russia. For example, it is already known that if programmable gate arrays (field-programmable gate array, FPGA) are prevented from entering Russia, it will not be able to produce high-precision cruise missiles such as Kh-101/Kh-555 (as well as "Lancet" type killer drones), or their quality will drop to an unacceptable level.

Among other things, in mid-2023 it became known that critically important components are primarily produced by five American companies – Analog Devices, Texas Instruments, Microchip Technology, Intel Corporation, and Advanced Micro Devices – they account for 52% of the technological imports found in Russian weapons systems. Thus, control of specific companies and tracking re-exports becomes one of the most important factors in deterring Russia.

There is a pressing need to include radical mechanisms. For example, the Ukrainian World Congress insists on a complete cessation of trade with the aggressor and disconnection of all Russian banks from SWIFT.

It is also necessary to resolve the issue of confiscating Russian assets. In fact, this issue has started to move, and it's important to ensure the steadiness of the process and minimize opposition.

Following diamonds, Western countries should dare to impose sanctions on all Russian non-ferrous metals, including titanium.

Experts also insist that Russian gas exports depend on the EU, and restructuring it towards China is a matter of many years. The trump card for a significant reduction in Russian gas production, one of the largest sources of foreign currency, is in the hands of Western countries.

Moreover, more and more experts tend to consider it necessary to impose sanctions and restrictions against companies that have not left the Russian market. This position is

controversial, but even initiating a discussion could become an impetus for preserving reputation and avoiding losses for some major business players.

Reducing Russia's defense and economic potential. Accelerating the collapse of Russian oil refining is possible: for direct forceful influence from Ukraine, more long-range drones are needed. Already, more than half of Russia's refineries are within the range of Ukrainian drones, and they are not well protected. In 2024, Ukraine attacked a dozen and a half Russian refineries with drones, more than half of them suffered certain, sometimes serious damage. At the same time, rectification columns are the weakest point of Russian oil refineries, as they have complex technological equipment. Moreover, rectification columns are practically impossible to physically protect from attacks – they are almost perfect targets. So far, economists claim that it's impossible to see the consequences in trade statistics: in 2023-2024, Russia's export of petroleum products remained at the level of 2.4-3.4 million barrels per day, and only in April 2024 it was slightly less (2.3 million barrels). The export of crude oil was equally stable - about 5 million barrels per day over the past two years. That is, attacks on refineries have not yet been able to achieve a significant impact on Russia's revenues, however, in addition to psychological pressure, these attacks have actually improved and, most importantly, "legitimized" in the West's view of the war, attacks on military and related targets on Russian territory. *In the future, this may be of key importance – under conditions of the deployment of large-scale military-technical cooperation between Ukraine and Western countries, primarily for the purpose of developing domestic missile weapons. It is missiles that Ukraine needs to destroy critical productions of the Russian military-industrial complex.* At the same time, attacks on Russian refineries can continue and increase in scale – over time, they should become part of an integrated missile and drone pressure on Russia, its military and related infrastructure. This will be the most powerful impact on the Russian economy. *It is the acceleration of own mass production of ballistic and cruise missiles, taking into account the receipt of Western components (especially for ballistic missiles that confidently "penetrate" Russian air defense), that can become a prerequisite for Ukraine to achieve significant political goals and contribute to ending the war on terms that will maximally take into account the interests of the Ukrainian nation.*

Technological and financial deterrence through blocking Russian arms exports and related critical goods. As is known, over the last ten years, Russian arms exports have fallen by 53%. Among other factors, this is related to large-scale losses on the battlefield. According to data from the Stockholm International Peace Research Institute (SIPRI), Russian arms exports fell by 53% between the periods of 2014-2018 and 2019-2023. As a result, Russia has ceased to be the world's second-largest arms exporter. *In 2023 alone, the figures were 52% lower than in 2022.* In 2023, only 12 countries received major Russian types of weaponry, compared to 31 countries in 2019.

Joint work between Ukraine and Western partners (through the creation of joint developments and productions of a higher technological level than in Russia) can block Russia in its key arms markets. Even before the full-scale invasion, the US achieved some success through the law on secondary sanctions for purchasing weapons from hostile countries – in the markets of Indonesia, the Philippines, and some other countries. Next in line is the complete diversification of India, which previously had 70% of its armaments of Russian origin.

For Ukraine, participation in this process is of vital importance, as it directly undermines the Russian economy and ensures its long-term technological degradation. And finally, after the complete utilization of Soviet weapons in the Russian-Ukrainian war, it's about participating in the redistribution of the global arms market, reaching a level of technological breakthrough from hostile Russia. This means ensuring guaranteed survival and transition to a stage of dynamic development, taking into account the course towards the latest technologies.

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