

REBUILDING UKRAINE'S DEFENSE INDUSTRIAL BASE

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KEY TAKEAWAYS

- Domestic production of essential equipment: artillery, drones, air defense, & armored vehicles
- Enact Ukraine defense production act designate special nato hubs
- Implement blockchain technology
- Enhance legal and regulatory framework
- Enact robust anti-corruption measures
- Develop a strong partnership framework
- Bolster insurance and risk management
- Strength in diversity: Ukraine is in a unique position to test various weapons systems on the battlefield
- Establishment of a Talpiot program would prove beneficial
- Improve battlefield management and situational awareness

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In order to recommend how Ukraine should develop its Defense Industrial Base (DIB), it is necessary to have a comprehensive understanding of the strategic objectives and operational needs of the Ukrainian Armed Forces as well as defining the desired composition and capabilities of the armed forces. This also hinges upon clarifying Ukraine's strategic direction in the ongoing conflict, as well as assessing its current capacity and potential for growth in critical areas.

STRATEGIC OBJECTIVES AND CURRENT SITUATION

Following the failed 2023 offensive, Ukraine finds itself compelled to adopt a defensive stance in the conflict. The ambitious offensive incurred significant losses in personnel and equipment as Russian forces entrenched themselves, fortifying their defenses effectively. Since Ukrainian successes in 2022, Russia has steadily recovered and bolstered its military presence and refined its strategies, gaining a newfound advantage over Ukrainian forces¹. This shift marks a pivotal moment in the conflict, with Russia gaining momentum for the first time since its initial invasion. Furthermore, with mass mobilization initiatives and the transition to a wartime production economy, the projection is for Russian forces to further augment in strength². With a finite number of resources and manpower, Ukraine's strategic focus must now pivot towards establishing a robust defensive posture, while retaining the agility to seize tactical opportunities and territorial advantages as they emerge³.

The current conflict bears striking parallels to the trench warfare of World War I, characterized by entrenched positions, costly offensives, and a dominance of artillery on the battlefield. It has evolved into a war of attrition, where the side capable of enduring the most casualties and firing the most munitions has the upper hand⁴. While aircraft, tanks and armored vehicles remain crucial for making strategic advances, they have become increasingly vulnerable in the face of modern threats such as SAMs, MANPADs, mobile artillery, and, notably, drones⁵.

¹ Hunder, M. (2024, February 21). *Ukraine Outnumbered, Outgunned, Ground Down by Relentless Russia* | Reuters.

<https://www.reuters.com/world/europe/ukraine-outnumbered-outgunned-ground-down-by-relentless-russia-2024-02-21/>

² Watling, Jack, and Nick Reynolds. "Russian Military Objectives and Capacity in Ukraine through 2024." *Russian Military Objectives and Capacity in Ukraine Through 2024*, Royal United Services Institute, 13 Feb. 2024, www.rusi.org/explore-our-research/publications/commentary/russian-military-objectives-and-capacity-ukraine-through-2024

³ Estonian MOD. "Setting Transatlantic Defense up for Success: A Military Strategy for Ukraine's Victory and Russia's Defeat." *Kaitseministeerium*, Kaitseministeerium, Dec. 2023, www.kaitseministeerium.ee/en/setting-transatlantic-defence-success-military-strategy-ukraines-victory-and-russias-defeat

⁴ Hunder, M. (2024, February 21). *Ukraine Outnumbered, Outgunned, Ground Down by Relentless Russia* | Reuters.

<https://www.reuters.com/world/europe/ukraine-outnumbered-outgunned-ground-down-by-relentless-russia-2024-02-21/>

⁵ Estonian MOD. "Setting Transatlantic Defense up for Success: A Military Strategy for Ukraine's Victory and Russia's Defeat." *Kaitseministeerium*, Kaitseministeerium, Dec. 2023, www.kaitseministeerium.ee/en/setting-transatlantic-defence-success-military-strategy-ukraines-victory-and-russias-defeat

Consequently, the role of tanks and armored vehicles has shifted from an offensive to a more defensive posture, primarily utilized for defending positions and seizing opportunities for advancement when they arise. Initially, the vulnerability of tanks and armored vehicles played to Ukraine's advantage, as Russian tanks were destroyed. However, the vulnerability of armor also proved to be a double-edged sword, as demonstrated by Ukraine's failed counteroffensive in the summer of 2023⁶.

The prevalence of drones on the battlefield significantly contributes to the static, World War I-like nature of the Ukrainian battlefield. Drones, both military and repurposed civilian, have emerged as versatile tools due to their ability to conduct reconnaissance and strikes while being both affordable and expendable. Although both sides are using drones in increasing numbers, it was the Ukrainian forces who initially repurposed civilian hobby drones for reconnaissance and makeshift ordnance delivery, presenting a cost-effective means of engaging the enemy with minimal risk to personnel⁷.

Moreover, drones play a crucial role in conducting aerial surveillance and targeting enemy positions, complementing artillery and other ordnance strikes. At the onset of the conflict, this innovative tactic afforded the Ukrainians a distinct cost-effective edge over the Russian's heavy equipment reliance. However, the Russian military has slowly adapted, leveraging electronic warfare (EW) techniques to disrupt drone frequencies, causing drone losses to mount as Russian EW capabilities improve⁸.

Nevertheless, as long as Ukraine can deploy sufficient drones to replace those lost, the strategy remains viable, underscoring the ongoing significance of drone warfare in modern conflicts⁹.

The Ukrainian battlefield presents a fascinating blend of traditional and cutting-edge technologies and tactics. Innovations such as drones, cell phone targeting, electronic warfare (EW) jamming, and MANPADs have fundamentally altered the dynamics of modern warfare. Simultaneously, older, mothballed platforms, notably armored vehicles, have experienced a resurgence in their utility and effectiveness¹⁰.

⁶ Estonian MOD. "Setting Transatlantic Defense up for Success: A Military Strategy for Ukraine's Victory and Russia's Defeat." *Kaitseministeerium*, Kaitseministeerium, Dec. 2023, www.kaitseministeerium.ee/en/setting-transatlantic-defence-success-military-strategy-ukraines-victory-and-russias-defeat

⁷ Boot, M. (2024, April 24). *Weapons of war: The race between Russia and Ukraine*. Council on Foreign Relations. <https://www.cfr.org/expert-brief/weapons-war-race-between-russia-and-ukraine>

⁸ Gibbons-neff, T., & Shyvala, Y. (2024, March 12). "jamming": How electronic warfare is reshaping Ukraine's battlefields. *The New York Times*. <https://www.nytimes.com/2024/03/12/world/europe/ukraine-drone-russia-jamming.html>

⁹ Gibbons-neff, T., & Shyvala, Y. (2024, March 12). "jamming": How electronic warfare is reshaping Ukraine's battlefields. *The New York Times*. <https://www.nytimes.com/2024/03/12/world/europe/ukraine-drone-russia-jamming.html>

¹⁰ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. *Critical Threats*. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

At the onset of hostilities, NATO and other Western allies contributed surplus military platforms and equipment to Ukraine, much of which was considered outdated or obsolete. Surprisingly, however, many of these older, lower-tech platforms have proven to be remarkably effective in Ukrainian combat scenarios. For instance, venerable vehicles like the U.S. M113 APC or the German Gepard self-propelled AA gun have become favorites of operators on the battlefield. This preference for older, analog equipment is attributed to its inherent reliability, simplicity in maintenance and repair, and resilience in the face of battlefield challenges¹¹.

Moreover, the performance of these legacy platforms on the Ukrainian battlefield offers valuable insights, as many had not been tested in the large-scale European theater they were originally designed for. For instance, the defensive nature of the battlefield renders the high-tech U.S. M-1 Abrams less suitable due to its design limitations. Its propensity to consume fuel and generate excess heat when stationary, makes it more vulnerable in prolonged defensive engagements than its British and German counterparts¹².

It should be added, that despite the success of analog equipment on the current battlefield there should still be a push to modify this older equipment with the Delta battlefield management system to ensure the situational awareness of Ukrainian forces.

In essence, the Ukrainian conflict serves as a proving ground where the effectiveness of both new and old former Soviet Union (FSU) and NATO military technologies are scrutinized and where the reliability and adaptability of legacy platforms shine through unforeseen challenges¹³.

Ukraine stands uniquely positioned to leverage its access to a wide array of military equipment, both antiquated and cutting-edge, sourced from across the globe. As much of this equipment has not been subjected to the rigors of a conflict on the scale of that in Ukraine, the country has effectively become a testing ground for NATO and FSU weapons systems. This presents Ukraine with an unparalleled opportunity to evaluate the efficacy of various platforms in real-world combat scenarios.

The hybrid utilization of NATO and FSU equipment, old and new alike, has already sparked innovative adaptations such as FrankenSAMs, GMARS, and the modification of the Bohdana self-propelled howitzer

¹¹ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. Critical Threats.
<https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

¹² Copp, Tara. "Ukraine Pulls US-Provided Abrams Tanks from the Front Lines over Russian Drone Threats." *AP News*, AP News, 26 Apr. 2024, www.apnews.com/article/ukraine-russia-war-abrams-tanks-19d71475d427875653a2130063a8fb7a

¹³ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. Critical Threats.
<https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

to accommodate 155mm artillery. This demonstrates Ukraine's capacity to innovate and optimize its arsenal through creative amalgamations of disparate technologies¹⁴.

To capitalize on this wealth of military assets, the Ukrainian forces must develop robust mechanisms for capturing data on platform performance, battlefield modifications, areas for improvement, and system effectiveness in different operational contexts. This data can then be systematically analyzed to inform strategy and tactics, enabling the military to refine its approach and determine the optimal applications for various platforms.

By leveraging this data-driven approach, Ukraine can not only enhance its military capabilities but also make informed decisions regarding which platforms to continue utilizing, producing, or modifying for specific operational requirements. In essence, Ukraine's role as a testing ground for military equipment presents an invaluable opportunity to drive innovation, improve combat effectiveness, and bolster its strategic position on the battlefield.

Ukrainian forces could also benefit from emulating aspects of the Israeli Talpiot program. This initiative dispatches top STEM graduates to various military units, providing them with firsthand experience in understanding the intricacies of military systems¹⁵. Upon completion, these students collaborate with the Israeli Defense Industrial Base (DIB) to develop and enhance military technologies and tactics. By implementing a similar program, Ukraine could tap into its pool of talented STEM graduates, empowering them to gain practical insights into military operations and equipment. This hands-on experience would not only foster a deeper understanding of military systems but also facilitate collaboration between academia, the military, and the DIB. As these graduates transition to roles within the DIB, they would bring with them a wealth of knowledge and expertise, driving innovation and advancement in Ukrainian military capabilities. Emulating the Talpiot program could serve as a catalyst for fostering a culture of innovation within Ukraine's defense sector, ultimately strengthening the country's position on the battlefield, and enhancing its ability to respond to evolving threats.

PRODUCTION PLAN

To best support the war effort, the Ukrainian Defense Industrial Base (DIB) must prioritize the production capacities that are crucial for sustaining combat operations. Chief among these is the production of artillery rounds, given the pivotal role that artillery plays on the Ukrainian battlefield. In fact, artillery

¹⁴ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. Critical Threats. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

¹⁵ "Talpiot Program." *Wikipedia*, Wikimedia Foundation, 28 Feb. 2024, [www.en.wikipedia.org/wiki/Talpiot_program](https://en.wikipedia.org/wiki/Talpiot_program)

accounts for a staggering 80% of casualties on both sides, making it the cornerstone of military strategy in the conflict.

ARTILLERY

The current war in Ukraine is arguably the most artillery-dependent since World War II. Recent months have seen a dramatic escalation in artillery usage, with Russia significantly outgunning Ukraine in terms of artillery fire. This shift is exemplified by Russia's daily expenditure of approximately 10,000 shells compared to Ukraine's 2,000, a staggering difference that underscores the urgent need for increased artillery production¹⁶.

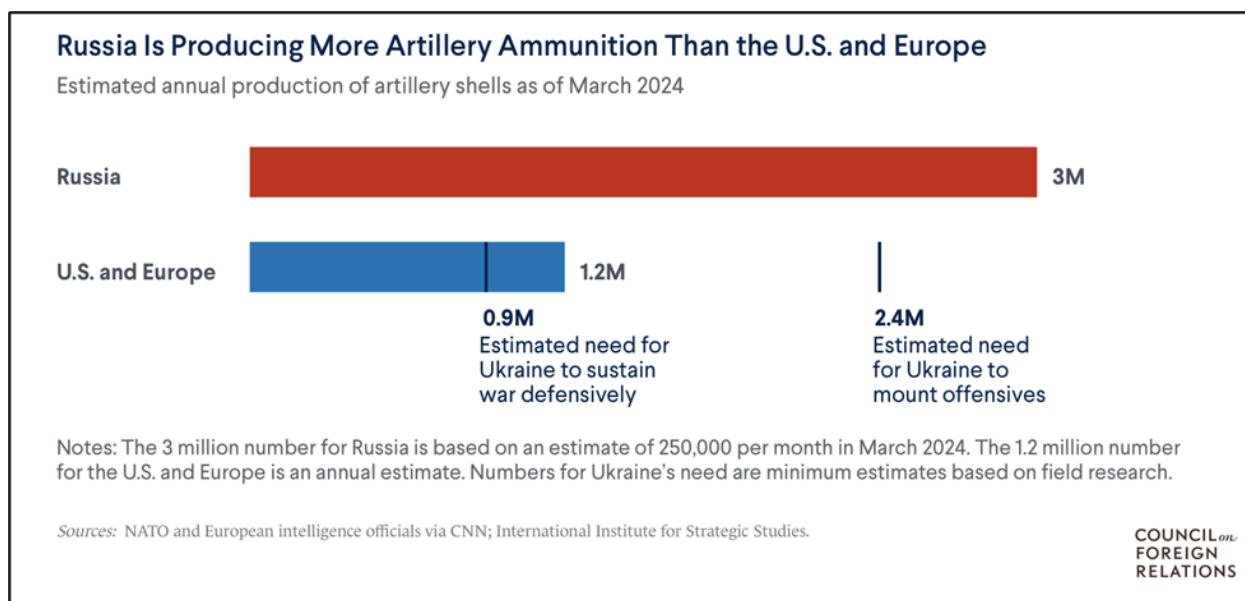
According to NATO intelligence estimates, Russia is projected to produce more than double as many artillery shells this year as the United States and Europe combined¹⁷. Russia's wartime posture, with defense spending at 6% of GDP, has enabled a substantial increase in artillery production¹⁸, further exacerbating the disparity between the two sides.

Given this critical shortfall in artillery shells, Ukraine is heavily reliant on NATO support to sustain its defensive capabilities. However, the combined annual production capacity of all NATO members falls significantly short of Russia's output. Without adequate artillery shells, Ukraine risks swift overrun on the battlefield. Therefore, one of the most urgent priorities for the Ukrainian DIB is to focus on ramping up both the production and procurement of artillery shells. Failure to address this shortfall would likely render Ukraine overwhelmed by Russian firepower.

¹⁶ Boot, M. (2024, April 24). *Weapons of war: The race between Russia and Ukraine*. Council on Foreign Relations. <https://www.cfr.org/expert-brief/weapons-war-race-between-russia-and-ukraine>

¹⁷ Boot, M. (2024, April 24). *Weapons of war: The race between Russia and Ukraine*. Council on Foreign Relations. <https://www.cfr.org/expert-brief/weapons-war-race-between-russia-and-ukraine>

¹⁸ Boot, M. (2024, April 24). *Weapons of war: The race between Russia and Ukraine*. Council on Foreign Relations. <https://www.cfr.org/expert-brief/weapons-war-race-between-russia-and-ukraine>



ARMORED VEHICLES AND REPAIRS

Ukraine should focus on having effective armored vehicles that best serve their needs on the battlefield. An urgent priority lies in the swift repair of battle-damaged equipment, particularly armored vehicles, to ensure their prompt return to the battlefield¹⁹. While tanks and other armored vehicles are vulnerable to modern threats such as drones and anti-tank weapons, they remain indispensable assets for protecting infantry and seizing opportunities for maneuvering on the battlefield. Joint ventures with Western defense companies, such as the strategic agreement between German arms manufacturer Rheinmetall and Ukroboronprom, play a crucial role in this endeavor. Establishing repair centers within Ukraine, as Rheinmetall plans to do for Leopard tanks and other German-provided equipment, would expedite the return of equipment to the battlefield, minimizing downtime and maximizing operational efficiency in the face of ongoing hostilities²⁰.

DRONES

Drones have emerged as a crucial asset in modern warfare, spanning from small commercial models to advanced military-grade variants utilized for reconnaissance and strikes. Ukraine's early integration of

¹⁹ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. Critical Threats. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

²⁰ Hoffmann, O. (2024, February 19). *Rheinmetall: Joint Venture with Ukrainian Partner*. Rheinmetall. <https://www.rheinmetall.com/en/media/news-watch/news/2024/02/2024-02-19-joint-venture-in-the-ukraine>

drones, especially small first-person view (FPV) drones, has provided a partial remedy for its artillery deficiencies, although their impact does not match that of artillery shells²¹.

Ukraine boasts a thriving domestic drone industry, anticipated to churn out 2 million drones by year-end²², supplemented by imports from NATO partners totaling another million in 2024. However, Ukraine faces substantial drone losses, with an estimated ten thousand drones lost monthly to one-way strike missions and Russian air defenses²³. Meanwhile, Russia has adapted with turtle tanks and its own drone capabilities, achieving, and exceeding parity with Ukraine in quantity and quality.

Furthermore, production engagements like Türkiye's leading drone manufacturer, Bayraktar, establishing a drone production facility and service center for Bayraktar TB2 drones in Ukraine presents an incredible opportunity for the Ukrainian drone industry²⁴. This venture is poised to significantly boost Ukraine's drone manufacturing capabilities and technological expertise. Encouraged by this development, Ukraine should actively seek out similar partnerships with other foreign drone producers to further enhance its drone industry and maintain its effectiveness on the battlefield.

SAMS AND AIR DEFENSE

Developing the capacity to effectively produce and replace air defense systems should be a priority for Ukraine. Considering that the Ukrainian Air Force is not able to challenge the second largest air force in the world (Russia), SAMs are necessary to protect Ukrainian cities, frontline forces, and new industrial facilities from Russian aircraft and missiles. The primary SAM in Ukraine's arsenal is the S-300 however their order of battle (OOB) consists of various types of FSU SAMs and AAA, as well as gifted SAMs from NATO countries such as Patriot missiles²⁵. As missiles are expended in Ukraine's self-defense and with successful Russian targeting of air defense stations, replacements are desperately needed. This past

²¹ Gibbons-neff, T., & Shyvala, Y. (2024, March 12). "jamming": *How electronic warfare is reshaping Ukraine's battlefields*. The New York Times. <https://www.nytimes.com/2024/03/12/world/europe/ukraine-drone-russia-jamming.html>

²² Struck, Julia. "Ukraine Poised to Produce 2 Million Drones in 2024." *Kyiv Post*, 6 Mar. 2024, www.kyivpost.com/post/29064

²³ Gibbons-neff, T., & Shyvala, Y. (2024, March 12). "jamming": *How electronic warfare is reshaping Ukraine's battlefields*. The New York Times. <https://www.nytimes.com/2024/03/12/world/europe/ukraine-drone-russia-jamming.html>

²⁴ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. *Critical Threats*. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

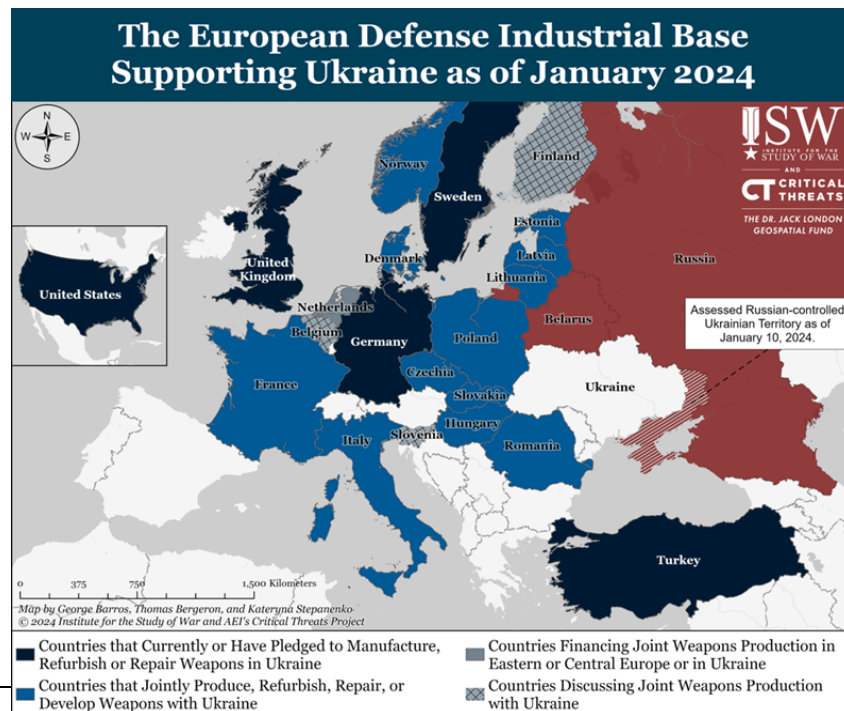
²⁵ Stepanenko, K. (2024, January 14). Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support. *Critical Threats*. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

April, President Zelensky claimed that Russian strikes on Kyiv were successful due to a lack of air defense missiles²⁶.

DRAWING IN WESTERN JOINT VENTURES

Involving Western defense companies in partnerships with Ukraine is crucial for sustaining the war effort and providing Ukraine with a technological edge over Russia. These partnerships not only enhance Ukraine's military capabilities but also reduce its dependence on political fluctuations within Western governments that may impact the flow of weapons and support. Establishing Western defense firms within Ukraine's borders not only strengthens Ukraine's defense industry but also incentivizes their home countries to actively support Ukraine's cause.

Moreover, having Western defense firms involved in the war effort ensures that NATO member states are directly invested in Ukraine's success. This "skin in the game" approach not only strengthens Ukraine's position but also fosters closer ties and mutual interests between Ukraine and its Western allies. Currently, defense firms from various NATO countries, including new member states like Sweden and Finland, are securing deals to produce weapons and materials in Ukraine, further bolstering Ukraine's military capabilities and resilience in the face of adversity²⁷.



²⁶ Shukla, S., Voitovych, O., Carey, A., & Edwards, C. (2024, April 16). *Ukraine ran out of missiles to thwart Russian strike on Power Plant, Zelensky says*. CNN. <https://www.cnn.com/2024/04/16/europe/ukraine-missiles-air-defense-zelensky-israel-intl/index.html#:~:text=A%20lack%20of%20air%20defenses,Trypilka%20power%20plant%2C%20Zelensky%20said>

²⁷ Stepanenko, K. (2024, January 14). *Ukraine's long-term path to success: Jumpstarting a self-sufficient defense industrial base with US and EU support*. Critical Threats. <https://www.criticalthreats.org/analysis/ukraines-long-term-path-to-success-jumpstarting-a-self-sufficient-defense-industrial-base-with-us-and-eu-support>

DEVELOPING THE DEFENSE INDUSTRIAL BASE

Ukraine is in the fight for its very survival as an independent, democratic nation in the modern world. Since Russia's full-scale invasion and the beginning of the Russo-Ukrainian War in February 2022, it has displayed unprecedented courage and bravery and has managed to stave off Russia's full occupation of its territory, but that ability to keep Russia out is quickly faltering. A massive expansion of its defense industrial base is needed with the ability to manufacture the necessary equipment within its borders, to build up stockpiles so that it has enough ammunition to fight Russia now, and arm and secure itself for the future, ideally getting back its territories that have been illegally annexed and occupied. The Western world has shown major support for Ukraine; virtually every country in Europe has donated some sort of equipment or financial support to the country, and the United States, too, has provided a lot of aid. There are many challenges ahead for Ukraine and much needs to be done to build up its defense industrial base keeping it safe from encroaching neighbors in the future.

UKRAINE'S DOMESTIC DEFENSE INDUSTRY

Ukraine should focus on its domestic defense industry, fund local partners to help produce the equipment that it needs as well as try its best to recruit Western partners and companies to either come and set up operations in Ukraine or to send over equipment and supplies to the country. There are several such initiatives already in place like Kyiv's Alliance of Defense Industries, Ukrainian Defense Innovations (BRAVE¹), ZBROYARI: Manufacturing Freedom Initiative, and the U.S. - Ukraine DIB Partnership, among others. Several companies have also either committed to or have already started operations in Ukraine, such as Türkiye's Baykar Defense²⁸ and Germany's Rheinmetall²⁹, which are building a drone factory and an ammunitions plant in Ukraine, respectively. There is also a joint NATO - Ukraine training facility in Poland³⁰, Lithuania becoming a repair hub for Ukrainian tanks³¹, and a partnership with Milrem Robotics to produce next-generation multi-domain robotic systems³².

²⁸ Magid, P. (2024, February 7). *Turkey's Drone Maker Baykar Begins to Build Plant in Ukraine*. Aerospace and Defense. <https://www.reuters.com/business/aerospace-defense/turkeys-drone-maker-baykar-begins-build-plant-ukraine-2024-02-06/>

²⁹ Ukraine Defense Industry. (2023, May 17). *Укроборонпром та rheinmetall створюють спільне підприємство*. Ukroboronprom. <https://ukroboronprom.com.ua/news/ukroboronprom-ta-rheinmetall-stvoryuyut-spilne-pidprijemstvo>

³⁰ Fornusek, M., & Pelechaty, T. (2024, February 15). *Stoltenberg: NATO, Ukraine to Launch Joint Training Center in Poland*. The Kyiv Independent. <https://kyivindependent.com/stoltenberg-nato-ukraine-to-launch-joint-training-center-in-poland/>

³¹ France-Presse, A. (2023, December 15). *Lithuania Now a Repair Hub for Ukraine's Tanks*. Voice of America. <https://www.voanews.com/a/lithuania-now-a-repair-hub-for-ukraine-s-tanks/7400176.html>

³² Milrem Robotics. (2023, December 7). *Milrem Robotics Partners with the Ukrainian Defence Industry to Forge Next-Generation Multi-Domain Robotic Systems*. Milrem Robotics. <https://milremrobotics.com/milrem-robotics-partners-with-the-ukrainian-defence-industry-to-forge-next-generation-multi-domain-robotic-systems/>

These are all examples of what is already happening on the ground and yet, Ukraine, does not seem to be progressing much in its fight against Russia, despite all the aid and support that has been given to it by its allies and partners around the world.

THE ROLE OF TECH IN THE WAR

Ukraine has emerged not only as a testing ground for new technology and weaponry but as a real-time analysis of how wars will be fought in the near future. It has shown its ability in taking Commercial-Off-The-Shelf (COTS) tech and leveraging it against the advancing Russian forces. Some of the biggest tech companies in the world, like Google and Microsoft have lent their expertise to the Ukrainians, particularly as related to satellite imagery and cybersecurity. Open-source intelligence (OSINT) has leveraged publicly gathered information into useful intelligence³³. Small, startup tech companies have also helped with the war effort and the Ukrainian government should pour more money into them to show their investment in the local community and to bolster the economy.

FINANCING THE DEFENSE INDUSTRIAL BASE

As far as financing goes, Ukraine cannot rely solely on Western aid, especially as we have already seen how fickle United States aid can be. While all the money poured into Ukraine from Europe, the United States, and other countries has certainly helped its war effort, it needs to find a more reliable, steady source of income. This could come in the form of the government establishing private-public partnerships with domestic companies in everything from tech to industrial production to raw materials. The government could also incentivize the Ukrainian diaspora living all over the world to assist, especially those who have their own companies. There are large fundraising campaigns going on now but those are not sustainable in the future, so the government needs to look elsewhere. Private, international contractors can be brought into the conversation. As mentioned above, the government can also invest in startups in the country or encourage the creation of startups, through some sort of competition and/or bidding process. All that money would go to Ukroboronprom, the Ukraine Defense Industry, which along with the Ministry of Strategic Industries of Ukraine, would allocate where those funds should go. This process would need to be transparent, fair, and equitable, ensuring that everything gets to where it needs to be going.

³³ McKay, H. (2023, January 18). *From Blockchain to COTS, Commercial Tech in Ukraine is Determining the Future of Modern Warfare*. The Liberty Star Dispatch.
<https://dispatch.libertyblockchain.com/from-blockchain-to-cots-commercial-tech-in-ukraine-is-determining-the-future-of-modern-warfare/>

Recently, the European Union has agreed to give Ukraine the profits of the frozen Russian assets that it has been holding since the start of the war. The European Trade Commissioner Valdis Dombrovskis, said that the funds would get to Ukraine as soon as possible, with the first €1bn (~\$1.08bn) - to be used "mainly for military support" - ideally reaching the country by this summer³⁴. This would be an unprecedented move but would ensure that Russia is paying Ukraine for its crimes against the Ukrainian people. According to German Chancellor Olaf Scholz, around 90% of revenues from frozen Russian assets would be spent on arms purchases for Ukraine. The value of the frozen Russian assets in the EU alone is estimated to be almost €211bn (~\$227bn)³⁵. If passed, this would be a unique way for Ukraine to finance its war and set aside funds for its reconstruction. The United States should follow in the steps of the European Union and do the same with its frozen Russian assets.

RECOMMENDATIONS

1. Domestic Production of Artillery Shells

- Since Ukraine is facing a severe shortage of artillery shells, it should optimize its domestic production of such equipment to the best of its ability by setting up factories and production/logistics centers around the country, specifically small hubs sprinkled throughout the West so as to shield them from Russian attack. These factories and/or logistics centers should be set up in areas of easy transport to the frontlines.
- Ukraine may need to increase steel imports so that they can produce the amount of shells that they need but in the meantime, they may need to rely on allies to supply the artillery. The Czech Republic has already committed to sending Ukraine extra shells but other parties need to step up and do the same.

2. Defense Production Act

- Ukraine must enact a Defense Production Act, similar to what the United States has, and focus its entire economy to produce all the necessary weapons and equipment needed for the war effort. This will also help it with its long term defense sustainment issues.

3. Increased Production of Drones

- First-Person View (FPV) drones have greatly enabled Ukraine's ability to fight on the battlefield and to ensure that that continues, Ukraine needs to ramp up its production of FPV drones domestically. It can be combined with the first point above, in that factories and production/logistics centers should be dispersed throughout the country, specifically

³⁴ Gozzi, L. (2024, May 8). *EU Moves to Give Profits from Russian Assets to Ukraine*. BBC News. <https://www.bbc.com/news/articles/c4n1y9zz8ydo>

³⁵ Gozzi, L. (2024, May 8). *EU Moves to Give Profits from Russian Assets to Ukraine*. BBC News. <https://www.bbc.com/news/articles/c4n1y9zz8ydo>

in Western Ukraine to ensure safety from Russia's attacks. Drones and artillery shells can be produced in the same facility and then sent to the frontlines.

- Ukraine can also team up with domestic tech companies in public-private partnerships to source the drones and/or parts needed. International tech companies can also pitch in and either donate drones to the Ukrainian military or set up shop in Lviv, which already has a thriving tech sector with more than 460 tech companies³⁶. If the aforementioned Defense Production Act is enacted, then those tech companies in Lviv can switch to drone production. Since FPV drones are not necessarily military equipment, their dual-use purpose can bypass some of the IP protections that companies may have in place for sending technology over.

4. NATO Hubs

- Ukraine is already doing this somewhat with the joint NATO training facility in Poland but these need to be expanded to other NATO and EU countries, specifically those that border Ukraine, like Romania, Slovakia, and Hungary. These can include everything from training facilities to resource hubs to logistics centers to production factories to help facilitate the war effort.

5. Ukraine DIB Conference³⁷

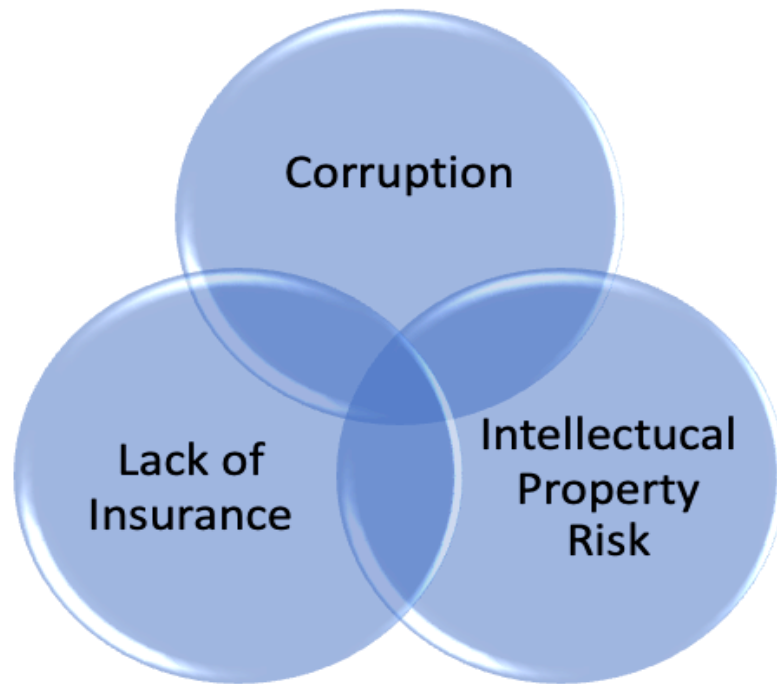
- A statement of intent has been signed by the United States, the Ukrainian government, and various industry partners to collaborate on the co-production of critical weapons, as well as technical and data exchange. This needs to be put into practice immediately so that this capacity-building can start and so that the necessary critical weapons get produced as soon as possible. This would be similar to the joint venture that Ukraine has set up with Rheinmetall but would be on a much larger scale.

6. Blockchain Technology

- Blockchain technology has emerged as a way to track goods moving through supply chains as well as everything that they go through on their journey to their final destination. One just needs a solid Wi-Fi signal to access the technology and this could be used in a military application. A grid could be created starting from the factory, border,

³⁶ Grid Dynamics Holdings, Inc. (2021, January 13). *Where to Outsource in Ukraine: Exploring Lviv's Thriving Tech Sector*. Grid Dynamics.
<https://www.griddynamics.com/blog/lviv-biggest-it-hub-ukraine#:~:text=Lviv%20is%20home%20to%20more,280%20t%20o%20300%20million>

³⁷ U.S. Department of Commerce. (2023, December 8). *Department of Commerce Hosts Ukraine Defense Industrial Base Conference*. U.S. Department of Commerce.
<https://www.commerce.gov/news/press-releases/2023/12/departments-commerce-hosts-ukraine-defense-industrial-base-conference>



logistics center, etc., tracing and tracking the military equipment to its destination on the frontlines. This would be updated in real time and the people back at the factory would be able to see which materials are needed when and produce them, as needed. The soldiers would theoretically also be able to see when the equipment is in route to them. All of this would streamline the logistics process and would get the weaponry where it needed to be and since every step of the way is tracked, it would be hard to hack or manipulate the data, potentially eliminating or decreasing graft of equipment and black-market transactions, cutting down on corruption. Based on the principles of transparency, verifiability, and predictability, this would build confidence and facilitate the implementation of arms control mechanisms³⁸.

³⁸ Miotto, N. (2022, January). *Blockchain Technology: An Innovative Policy Tool for Enhancing Conventional Arms Control and Verification*. Strategic Security Analysis. <https://dam.gcsp.ch/files/doc/ssa-2022-issue21>

CORRUPTION AND GOVERNANCE ISSUES

Amid myriad challenges to rebuilding Ukraine's Defense Industrial Base, including ongoing conflict and damage to the energy infrastructure, there are several challenges to attracting traditional and alternative financing to Ukraine. Long-standing perceptions of corruption, concerns about protecting U.S. companies' intellectual property rights and arms transfer rule, and the lack of availability of insurance are paramount. These challenges intersect; judicial and administrative corruption influences the adjudication of disputes about intellectual property violations and insurance coverage.

HISTORICAL + CURRENT CONTEXT OF CORRUPTION IN UKRAINE

Corruption in Ukraine has deep roots in the post-Soviet era, primarily due to the chaotic privatization processes that frequently lacked transparency and accountability. This historical backdrop has contributed to persistent challenges in combating corruption nationwide. However, Ukraine has made significant strides in addressing these issues in recent years, as evidenced by improvements in the 2023 Transparency International Perceptions Index. Despite this progress, changing the entrenched perceptions of corruption remains a long-term challenge.

Ukraine grapples with various forms of corruption that impact its socioeconomic landscape and military effectiveness. These include “shrinkage” and uneven supply of weapons, uniforms, and food, embezzlement, conscription avoidance through bribery, price gouging, and fraudulent contracts. These factors not only undermine the integrity of Ukraine's institutions but also pose significant risks to the success of its ongoing war efforts. These corrupt practices directly influence issues such as donor country reluctance to supply weapons, the effectiveness of the military, and insufficient troop levels (due to corruption in the conscription process).

Ukraine has embarked on a robust anti-corruption agenda in response to these pervasive issues. Noteworthy initiatives include the development of digital governance platforms like [ProZorro](#) and

[DoZorro](#), designed to enhance transparency and the rule of law in public procurement processes. Additionally, efforts towards “de-oligarchization” aim to dismantle “manipulatory elites” that have historically fueled corruption. The judicial sector is also undergoing significant changes; with half of the judicial positions vacant, a new council for judicial selection has been established to refresh the old guard with more accountable personnel.

Russia seeded corruption via investments in key Ukrainian sectors. With the exit of all Russian businesses, there is an opportunity to rebuild these sectors in cleaner, more transparent ways. Actions already taken to strengthen anti-corruption frameworks include bolstering the anti-corruption infrastructure within Ukroboronprom and responding swiftly to corruption scandals.

Despite these advancements, the perception that fair adjudication is still out of reach remains a significant barrier to investment. Intellectual property and insurance disputes are often viewed as adjudicated inconsistently and arbitrarily, which deters foreign investment and economic development.

The international community and Ukrainian authorities must work collaboratively to establish a robust judiciary system to protect intellectual property rights and ensure fair settlement of insurance claims. This would counter the corruption and build investor confidence, which is critical for Ukraine's economic recovery and long-term stability.

Despite these advancements in anti-corruption initiatives, a perception remains that fair adjudication is still elusive in Ukraine. This inhibits investment since the adjudication of intellectual property and insurance disputes are viewed as inconsistent and arbitrary. Establishing an independent, objective, and expert system based on the [Dubai International Finance Centre Court](#) (DIFCC) is necessary. The newly established judicial system will ensure fair investigations and consequences/penalties for intellectual property violations and insurance coverage disputes and will help build local expertise in these areas so adjudication can be handled locally over the longer term.

The international community needs to establish an independent judiciary system to counter/erode corruption enough so investors are confident that their intellectual property will be protected and that their insurance claims are settled fairly.

INTELLECTUAL PROPERTY (IP) CONCERNS

CHALLENGES TO PARTNERSHIPS WITH U.S. DEFENSE FIRMS

Partnerships between Ukrainian defense firms and their U.S. counterparts face several critical obstacles, primarily centered around intellectual property controls and regulatory frameworks. One major area of concern is the exportability of technologies, where stringent controls limit the ability of U.S. firms to share sensitive technology and products with Ukraine. This is compounded by issues related to data accessibility and the general lack of professional management within Ukrainian defense firms, which can deter U.S. companies concerned with operational integrity and compliance with international standards.

Regulatory restrictions further complicate the potential for partnerships. The Arms Transfer Export Control Act (Title 22) and the International Traffic in Arms Regulations (ITAR) play pivotal roles in governing the transfer of arms and sensitive technologies. ITAR, alongside the Export Administration Regulations (EAR) and various multilateral agreements like the Wassenaar Arrangement, the Missile Technology Control Regime, and the Australia Group, establishes a comprehensive framework that restricts the export of not only conventional arms but also a broad spectrum of dual-use and sensitive technologies. These regulations encompass a wide array of items including nuclear materials, navigation systems, avionics, materials processing technology, and computers. The Export Control Reform Act of 2018 (ECRA) further updated these regulations, aiming to streamline some processes, yet the review times and the layered compliance requirements remain a significant hurdle.

Bureaucracy within Ukraine's Ministries of Defense, Digital Transformation, and Strategic Industries also presents a barrier since triplicate approval is needed to approve foreign investment in Ukraine. The layers of governmental oversight and complex administrative procedures can slow down or complicate collaborative efforts and technology transfers, making it challenging for U.S. firms to navigate partnership agreements efficiently. Israel has successfully streamlined the communication and approval process among science, military and business, which has resulted in a quick process to commercialize military technology. Ukraine can adopt a similar model, which will accelerate investment.

These obstacles necessitate a careful, strategic approach to fostering bilateral defense relationships, requiring both enhanced regulatory compliance from Ukrainian firms and external assistance in the form of embedding Department of State personnel in the Ministries of Digital Transformation and Strategic Industries (just as Department of Defense representatives are aligned with Ukraine's Ministry of Defense).

INSURANCE AVAILABILITY

The lack of war risk insurance availability is hindering investment, since investors need to be confident that their real (buildings) and personal (equipment, machinery, and inventory) and foreign national employees will be protected in case of loss. Shortly after Russia invaded Ukraine, commercial insurance companies universally attached “Ukraine, Russia and Belarus Exclusions” to all property and liability policies, precluding any coverage for damage to property or people in Ukraine. Currently, the only coverage available is very costly and limited “business travel accident” coverage for business travel to Ukraine and the [Unity Insurance Facility](#) created by Marsh & McLennan, a global insurance broker, in partnership with Lloyd’s of London and the Ukrainian government and Ukrainian banks. Initially created to provide insurance for grain and other food shipments, Unity has now been expanded to include shipments of other non-military cargo traversing the Black Sea.

Marsh & McLennan has also created a [risk-assessment tool](#) which mapped all war-related incidents since the inception of the war, including location and damage sustained. The application of this tool can enable U.S. companies to locate facilities and labor forces in less vulnerable areas and will enable insurers to calibrate the risk by location. Marsh is also involved in advocating for public-private partnerships with European countries to provide war risk insurance to companies operating in Ukraine. We propose creating a U.S. government supported insurance solution for U.S. companies supporting Ukraine’s recovery, modeled on the Terrorism Risk Insurance Act, instituted after the September 11 attacks.

In conclusion, long-standing perceptions of corruption, concerns about protecting U.S. companies' intellectual property rights and arms transfer rules, and the lack of availability of insurance are significant challenges to the recovery of Ukraine’s Defense Industrial Base. These challenges intersect - judicial and administrative corruption influences the adjudication of disputes about intellectual property violations and insurance coverage – and innovative solutions are required to support Ukraine’s recovery.

RECOMMENDATIONS

1. Enhance Legal and Regulatory Framework

- Establish a specialized business court like the [Dubai International Finance Centre Court](#) (DIFCC) based on European Union law to expertly and objectively adjudicate IP and insurance coverage disputes; this will reduce perceptions of corruption, increase expertise and specialization, and fairly resolve intellectual property disputes and insurance claims. It will also speed integration into the EU by incorporating its legal framework and will

build local legal expertise in these fields, so they can be adjudicated in the Ukrainian legal system over the longer term.

2. Enact Robust Anti-Corruption Measures

- U.S. advisors should be embedded in Ukraine 's Ministries of Strategic Industries and Digital Transformation to foster anti-corruption measures; model after the Department of Defense's Ministry of Defense Advisors.
- Independent supervision of Ukroboronprom/UDI should be implemented to ensure transparency and efficiency.
- Blockchain technology and a simple barcode tracking system should be deployed for all weapons, ammunition, and supplies supplied to Ukraine, allowing for easy scanning using the basic tablets used by the Ukrainian military. RFID tracking is often used for inventory management but can be vulnerable to interference by Russia.
- A partnership with Lithuania and global anti-corruption organizations should be established to strengthen international cooperation against corruption.

3. Develop a Strong Partnership Framework

- Streamline bureaucratic hurdles to investment caused by the triplicate approval process by Ukraine's Ministries of Defense, Strategic Industries, and Digital Transformation; this will also streamline commercialization of military technologies and attract investment
- The State Department should revise its travel advisories for certain areas of Ukraine (based on [Marsh's Risk Assessment Tool](#)) to enable collaboration on investments and recovery efforts, which could also help alleviate the labor shortage through selective migration. To attract and facilitate investment, it's important to convey that Ukraine is "open for business".

4. Bolster Insurance and Risk Management

- Public-private partnerships like the Terrorism Risk Insurance Act should be formed for companies investing in Ukraine's Defense Industrial Base and in general reconstruction, initially covering general risks like fire, lightning, vandalism, flood and earthquake damage but expanding later to war risk and aviation insurance when the active conflict subsides. A "Ukraine Recovery Insurance Act" would provide a public backstop for losses exceeding a certain threshold (initially low, increasing as security increases).
- Work with U.S. insurance companies to create an exception to the "Ukraine Exclusion" in U.S. insurance policies for non-war risk exposures such as fire, windstorm and lightning

damage and other perils, modeled after the revision to insurance companies' "Terrorism Exclusions" after the inception of TRIA.

5. Investment Initiatives

- A Ukraine Opportunity Fund and Ukraine Opportunity Zone should be established to incentivize US defense firms to partner with Ukrainian firms through tax incentives and tax rebates on exports to Ukraine. The Fund could be funded by a portion of approved military assistance. The Zone could initially be in neighboring NATO countries due to war risks and labor shortages until the conflict subsides. Then, insurance will be available, and the labor force will be augmented with military veterans. Incentives for U.S. companies to participate could include tax rebates for profits from exports.
- Extension of US patent/trademark protections (or other IP benefits) should be granted to US defense firms forming joint ventures with Ukrainian firms and those accessing the Fund and participating in the Zone.
- The Department of Defense should expand its "IP as a Service", streamline rules to avoid "vendor lock" and increase royalties paid to US companies whose technology is exported.

6. Export Control Reforms

- Fast Track ITAR review time for U.S. firms investing in Ukraine Opportunity Zone/Ukrainian defense firms, in consultation with the [Defense Trade Advisory Group](#)
- "Not Releasable to Foreign Nationals" (NOFORN) restrictions should be limited, with exemptions like those in [AUKUS](#), and a test case should be conducted with a U.S. company to jointly produce advanced unmanned weaponry.

7. Infrastructure and Training Enhancements:

- A U.S.-sponsored management training institute should be established for Ukrainian defense leaders, perhaps a collaboration between Middlebury Institute and Naval Postgraduate School.

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Rebuilding Ukraine's Defense Industrial Base
Newsom, Pshonyak, Short