DEFENSE, EMERGING TECHNOLOGY, AND STRATEGY PROGRAM

What the European Drone Defense Initiative Has to Get Right

Alexander Kutovyi

HARVARD Kennedy School
BELFER CENTER
50 YEARS OF RESEARCH, POLICY, AND LEADERSHIP

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About the Author

Alexander Kutovyi is a 2026 graduate of the Harvard Kennedy School (MPA) and the Wharton School of the University of Pennsylvania (MBA), where his work focused on the intersection of national security and technology. He is currently at Citadel Securities, following machine learning and leadership roles at Klarna, Google, and Microsoft. Ukrainian-Swedish, he holds prior degrees in economics and statistics from Taras Shevchenko National University of Kyiv and Stockholm University.

Acknowledgments and Disclaimers

"To the dead, the living, and the unborn..."

– Taras Shevchenko

First and foremost, the author wishes to honor the Ukrainian civilians and service members who have defended their country against the Russian invasion, and with it the security and freedom of Europe, at a cost measured in blood, bereavement, and millions of lives forever altered. This report is dedicated in particular to Ukrainian infantrymen who left behind the life they knew and, despite all odds and extreme exhaustion, continue to bear burdens of this war on their shoulders. It also recognizes every engineer whose ingenuity has reshaped the battlefield, every volunteer whose persistence has sustained the defense, and every family whose loss and sacrifice shall not be forgotten.

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The author acknowledges that the Russian invasion of Ukraine has operationally and strategically evolved at a pace rarely seen in the recorded history of wars. Accordingly, the observations and assumptions presented in this work may have a limited horizon of relevance as technologies, tactics, and ground realities continue to change rapidly.

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Executive Summary

In September 2025, Russian drones crossed into Polish airspace, exposing substantial structural weaknesses in NATO's eastern-flank defenses, as its exquisite fifth-generation fighter jets and Patriot batteries struggled to effectively counter $35,000 decoys. The most important revelation these events made impossible to ignore was that Europe's air-defense economy is incapable of countering Russia's MIC's capacity to overwhelm it with its evolving drone production. As of the middle of 2025, the output of Russian Alabuga facilities alone had already reached 170 Shahed-type drones per day.

The assessment in this paper concludes that EDDI, in its current form, although a step in the right direction, will likely underdeliver. The current approach focuses on multi-year funding for effector production through major European contractors, but generally ignores detection architecture, which is likely to become a binding constraint later on. As of early 2026, the only country scaling counter-drone capacity at a rate sufficient to counter Russian offensive capabilities is Ukraine. The €150 billion allocated to change the status quo is enough resources to build an effective defense architecture, but also enough money to build the wrong thing at scale.

Key Assessments:

- **Developments.** If no changes follow, the EU risks ending up in a situation where the €150 billion Readiness 2030 package will produce 27+ systems that, despite sharing the same funding source, will remain incompatible with one another and will mainly solve problems that will no longer be relevant by the time the systems get deployed.
- **Recommendations.** Firstly, European manufacturers must publish their APIs as a prerequisite for EDIP funding. Any funded effector must plug into any funded detection layer. Secondly, the €300 million Ukraine Support Instrument should be conditioned on IP licensing terms favorable to frontline EU members. Thirdly, the EDIP joint-procurement program should be split into accelerated and standard tracks to provide a fast lane for frontline member states directly exposed to the threat.
- **Risks.** Failure to adequately address existing issues may result in a set of substantial negative consequences for the EU defense capabilities. Firstly, the procurement cycle might get locked in around closed interfaces. Secondly, the broader integration of Ukraine partnerships into the EU defense architecture may not happen fast enough. Thirdly, at the end of 2026, EDDI's IOC may face the reality of reactive-jet Shaheds and EW-saturated profiles for which it was never designed.

Introduction

On the night of 9-10 September 2025, nineteen Russian UAVs crossed into Polish airspace.[1] NATO forces destroyed four on contact, as Dutch F-35As from the 313th Squadron did most of the work.[2] Within several hours, Poland invoked Article 4.[3] It took NATO a few more days to launch Operation Eastern Sentry – aircraft and air defense assets were drawn from Denmark, France, Germany, Italy, the Netherlands, the United Kingdom, Spain, and, later, Norway and Sweden.[4] The European Commission, which had declined to fund an Estonian-Lithuanian drone wall proposal at the Commission level as recently as March 2025, reversed its position within weeks. It has ambitiously proclaimed the European Drone Defense Initiative (EDDI) to be a European Drone Wall.[5] The counter-UAS pillar of the Eastern Flank was assigned a rather aggressive timeline: launch scheduled for Q1 2026, achieve initial operational capability by the end of 2026, and reach full functionality by the end of 2027.[6]

The incursion at that point, however, turned out not to be a one-time misunderstanding (or a surprise, for that matter). In a couple of days, on 13 September, a Russian drone breached Romanian airspace – this was already the eleventh such incident recorded by Bucharest alone.[7] Three Russian Air Force MiG-31s intruded into Estonian airspace for about 12 minutes on 20 September.[8] Over the period between autumn of 2025 and winter of 2026, unidentified drones have also been repeatedly spotted near major European airports and military bases,[9] with little success in intercepting them.[10] What arguably made the Polish event distinctive, however, was its scale, audacity, and depth. Drones penetrated several hundred kilometers inland, and, in an unfortunate accident, one Polish AIM-9X fired in an interception attempt damaged a civilian house in Wyryki-Wola (which Warsaw initially attributed to a Russian drone).[11] The political repercussions were, of course, substantial, but the operational revelations were arguably far more consequential. Europe and the entire world have witnessed how state-of-the-art fifth-generation fighters and exquisite Patriot batteries scrambled against $35,000 decoys with a rather questionable degree of efficiency.[12]

Numbers Game

The asymmetry of costs was not exactly a uniquely European phenomenon – the United States had already faced similar challenges[13], but at that time, it could still afford to ignore the emerging problem. There were at least two illustrative instances over the last two years' worth mentioning. The first one occurred between October 2023 and January 2025, as the US Navy spent roughly $1 billion on air defense munitions[14] to defend Red Sea shipping against low-tech Houthi drones costing $5,000 to $20,000 each.[15] The US forces were firing approximately 220 interceptors at an average cost of $4.5 million per shot, which probably could be considered a suboptimal long-term strategy to tackle this problem. The acting Chief of Naval Operations testified in June 2025 that Standard Missile stocks were depleting at an "alarming" rate, and by mid-2024, the Navy had already shifted to Sidewinders (~$500,000) and Hellfires (~$150,000) against UAV targets.[16]

The second instance is unfolding now, along with the Operation Epic Fury launched against Iran on 28 February 2026.[17] The US Central Command's Task Force Scorpion Strike deployed hundreds of LUCAS one-way attack drones that were reverse-engineered from captured infamous Iranian Shaheds, at a unit cost of $35,000 to $55,000, to strike Iranian targets directly.[18] Although Gulf partners pressed Washington for the replenishment of Patriot and THAAD systems,[19] developments in this war also led them (and, eventually, the US too[20]) to explore Ukrainian-designed interceptor drones.[21] These developments served as a final empirical proof of an otherwise intuitive conclusion – in a contest between cheap and mass-produced weapons, the expensive and scarce counter-solutions might only take you so far, and either force the defensive party to bleed resources or lose their textbook efficiency under repeated pressure altogether. EDDI fundamentally faces the same arithmetic as US Navy ships did in the Red Sea.

The Production Curve

In the meantime, fueled by years of combat experience and oftentimes learning the hard way, Russian Shahed production has moved faster than the European response. The Alabuga Special Economic Zone in Tatarstan reached roughly 170 drones per day by July 2025, and about 190 per day by the end of 2025.[22] Satellite imagery analyzed by the Institute for Science and International Security through mid-2025 showed at least eight new warehouse structures under construction

and significant expansion of worker housing.[23] Russia, in a rather common style for its MIC, focused on a limited range of nomenclature that it attempts to produce in substantial volumes. Ukrainian military intelligence estimated the total monthly capacity to be about 2,700 drones as of September 2025.[24] CSIS characterizes the current strike pattern as "coercion by salvo," where the attacking side ramped up and now deploys swarms of 800-plus drones per night.[25]

The tactical shift behind those numbers matters more than the numbers themselves. Vasyl Dubovyi, the Ukrainian Armed Forces officer leading the Group 12 analytic unit studying weapons behavior in combat, observed in a February 2026 interview that the previously considered quite successful Gerbera decoy program has collapsed in the opposite direction from what Ukrainian air defense planners anticipated. Earlier, many in Ukrainian military circles expected the ratio of drones with a payload (Shakhed) to decoy drones (Gerbera) to be around 1:3, as it was believed this tactic would quickly deplete opponents' air defense capabilities. The actual share of decoys by late 2025, however, sat at roughly 30% and dropped further to a mere 10% by early 2026.[26] As it turned out, the Russians managed to drive the unit cost of Shahed drones into numbers that were so low that the decoy drones eventually lost their operational purpose.

The final evidence for why this tactic seems very effective is that, as of spring 2026, it has been successfully replicated by Ukraine, which began launching more drones into Russian territory than Russia did into their opponent's on a monthly basis.[27] Which, given Russia's enormous geographical challenges and scarce anti-aircraft capabilities, has become an acute problem for the original inventors of this strategy, who now have to face it themselves.

The (Non) Coherence

The operational consequences of drone warfare development have arguably exposed European procurement procedures to be largely misaligned with the reality of modern warfare. Sophisticated legacy radar networks were certainly useful to some extent, but were optimized for the identification of enemy jets and ballistic threats and have proven to perform quite poorly against low-flying, small-signature, low-thermal-footprint drones.[28] Ironically,

Poland's SkyCTRL anti-drone system, the capability that might have detected the September incursion at source, had been delayed by the Polish Ministry of Defense for 18 months due to a lack of funds and sat effectively inactive on the night of the attack.[29] At a time when NATO's Eastern Flank was in dire need of low-cost-per-shot systems, political inertia still favored high-value fighters that scrambled against $35,000 decoys.[30]

It would be fair to mention, however, that even as Ukraine (and Russia) have evolved extraordinarily in their capacity to handle these threats over time, at the architectural level, they still lack the alignment embedded by classical surface-to-air missile unified solutions that consist of three key components – detectors, command-and-control, and effectors. And while they have to make hard prioritization choices and operating under constraints of the ongoing war – this excuse cannot be applied to the EU.

The emerging European and existing Ukrainian interceptor drone ecosystems still offer the effector alone, with radar, acoustic, RF, and electro-optical cueing layers, rather poorly integrated across a wide spectrum of unstandardized vendors.[31] Most EU member state procurement strategies, driven by national prime contractors and the lower regulatory friction of buying more of what already exists, experience this problem one way or another.[32]

Structural Tensions

To be practically meaningful, the 2026 EDDI architecture must address three tension points that will largely shape its viability far more than any technology choice in isolation.

1. *"Frontline" vs. "Core" EU.* Finland and Poland jointly lead the Eastern Flank Watch, established at the December 2025 Helsinki summit of eight eastern and Nordic states. At the same time, France and Germany expressed what could be interpreted as skepticism toward Commission-led defense coordination, signaling a preference for joint ventures subject to European content rules instead.[33]
2. *EU vs. NATO.* EDDI and Eastern Sentry compete for the same production capacity and member-state political capital. EDDI draws on the €1.5 billion

European Defense Industry Program adopted in March 2026 and on SAFE financing, under Commission coordination.[34] Eastern Sentry operates under SACEUR command, is funded through national contributions and NATO common funding, and draws on assets from non-EU allies, including the United Kingdom, Norway, and Canada.[35] In a nutshell, member states allocating interceptor production to one program effectively reduce what's available to the other, and the two frameworks have no shared procurement pipeline.

3. *Brussels vs. EU National Capitals.* Commission defense competences remain bound by Article 346 TFEU and by Council unanimity on foreign policy, so every coordination standard will be read by at least one capital as an encroachment on national prerogatives.[36] And history has shown – reaching alignment across the entire EU is not always an easy endeavor.

An EDDI that resolves these tensions by concession, funding the expensive-effect contracts European primes already want to build, deferring interoperability standards, and papering over the frontline/core split with symmetric participation, will, of course, produce some initial operational capability, but largely against a threat that has already evolved multiple times over. Reactive-jet Shahed variants, swarming tactics, and GPS-denied profiles are on the Russian production roadmap for 2026-2027, leaving the EU no time to adjust. The €150 billion Readiness 2030 toolbox is a substantial budget, but without addressing its flaws, it's no more than a substantial waste of resources and time.

Identification

Fundamentals

In principle, a counter-UAS system does three main things. (1) It sees a threat, (2) decides what to do about it, and (3) delivers an effector. As mentioned previously, a classical surface-to-air missile complex, such as NASAMS, S-300, or Patriot, integrates all three out of the box and is typically procured as a comprehensive (or at least mutually compatible) package. Almost all of them include a radar of some sort, a command-and-control component, and launcher(s).[37] When these components are calibrated and operating together, procured as an aligned system, and deployed as one – they are effective. But if any component goes down, pretty much the entire system loses most of its combat readiness instantly, often turning into no more than practice targets for the adversary. Given how new this field is and how expensive R&D could get for some of these components, as of 2026, most vendors sell the effector (the drone-interceptor) alone, leaving the detection and cueing layers to whoever happens to be buying.

The unavoidable consequence of this setup is that each ground station operates on its own protocol, at its own (quite arbitrary) precision standard, and, in the case of Ukraine, often with its own budgets. A small tactical radar, intended for situational awareness, is also tasked with providing illumination and guidance to the interceptor. Some producers try to make one radar do both functions, and (more often than not) it hurts both intended outcomes. This may work for an R&D demonstrator on a training ground, but it does not really scale to an air defense doctrine that covers half of a continent.

Ecosystem

The detection problem may look easy (after all, if we can identify missiles, how hard could it be to deal with a plastic drone, right?), yet in practice, it is extraordinarily annoying to deal with. New generations of Russian Shaheds and Gerbera drones fly low, slow, and maneuver.[38] They cause a lot of trouble due to their small radar cross-sections and barely noticeable thermal signatures. Legacy air defense radars optimized for fast jets and ballistic threats performed poorly against these targets (at least initially). Consequently, the operational implications

were evident in cases where NATO's detection chain identified incursions via high-end AWACS and scrambled fighters, and the effector layer (F-35s, F-16s, Patriots) expended high-end ordnance (AMRAAMs).[39] The same issue is now replicated in Ukraine, as growing efficiency of interceptor drones is capped not only by the availability of resources and operators, but also by early identification of targets that would allow for the timely deployment of cheap intercepting assets.

The fusion layer is where the technology and vendors are arguably furthest behind, and the EDDI funding documents don't yet address this problem. That said, the private sector is aware of this, and efforts are underway to address the problem. For instance, Quantum Systems' work on Mozaic is the clearest visible counterexample inside the project's evidence base. Their solution includes a cross-platform command layer that ingests feeds from Vector reconnaissance aircraft, Twister tiltrotors, Sparta launch platforms, Frontline multirotors, Tekever Termit, and Virtus Start, and allows an operations commander to plan missions and take direct control.[40] The acoustic sensor shipped on late-generation Vectors provides azimuth and range measurements of approximately 30 kilometers. In his recent interviews, the managing director of Quantum Systems Ukraine mentioned that the next step in development is the classification of targets, which would include distinguishing, for instance, Shahed from other types of loitering munitions or decoys. This, of course, requires aggregating relevant datasets,[41] which gives Ukrainians an edge (at least temporarily).[42]

One may argue that this is the work European procurement has to fund. And, to stretch the argument a little further, maybe even the work notoriously slow European procurement has historically been worst at, given that the deliverable isn't a unit on a factory line but a software stack that has to be continuously retrained against an adversary that iterates every six months.

Situational Awareness

One way this problem could be tackled is illustrated by the example of the Ukrainian Delta. This solution was meant to integrate under one roof (1) reconnaissance, (2) targeting, (3) strike coordination, (4) training, (5) data aggregation, and (6) operator scoring into a single situational-awareness platform[43] – a kind of Palantir but with a much more constrained budget and arguably more acute timelines for delivery.[44] It would be fair to say that, as of

now, it is well known to and used by the entire Ukrainian Armed Forces.[45] An important feature that has shaped this solution is that Ukraine had to face the challenge of managing hundreds of fragmented vendors across various scales and user types, with varying levels of expertise. There are, of course, practical advantages, as Ukrainian operators moving between systems get 90% of what they need because the control layer is already familiar. But the side effect is that Delta is not exportable as-is/out of the box.[46] It's built around Ukrainian rather chaotic and decentralized wartime command structures/realities, operational security assumptions, and a single-purchaser forcing function that doesn't exist in a 27-member procurement environment.

What it proves, however, is that a working multi-domain counter-UAS fusion layer is technically achievable, at least at the state level, and may not cost billions of euros. But Europe's procurement instincts, often driven by national interests and multi-year certification cycles, are a serious complication. In all fairness, Germany has announced a tender for a 2026 digital battlefield solution,[47] explicitly inspired by Delta. And yet the rest of EDDI hasn't.

Critique

A common counterargument to prioritizing detection is that production capacity is the real bottleneck. After all, it is an interceptor that deals with an incoming drone. And yet, there is evidence that we already reached market saturation and there are established players that are capable of handling the production scale issue, as, in Ukraine, it is only three systems that deliver approximately 80% of all Shahed and Gerbera kills through November 2025 onward, and new interceptors market entrants reached a combined 12-15%.[48] But the market concentration data arguably indicate against an effector-first procurement approach. Interceptors saturated the niche quickly because the key problem they were tasked with solving (kinetic interception of loitering munitions at 100-250 km/h) is, relatively speaking, straightforward. Detection and fusion, however, is a whole other can of worms that requires different solutions (and R&D budgets). Funding effectors first and sensors later will almost certainly repeat the Ukrainian trajectory in reverse: buying what's easy to contract before solving what's actually hard and important to design. EDDI has an opportunity that Ukraine did not have under wartime conditions – to set the fusion standard before the procurement cycle locks in.

Interception

Unit Economics

As complex as it is, the development of an intercept remains arguably a simpler engineering problem than that of the full identification-interception cycle. Over the last two years, Ukraine has demonstrated an impressive capacity to evolve in this domain. Ground-launched interceptor drones (and, recently, air-launched solutions that use Antonov An-28 platforms) are quickly narrowing a previously wide gap that exquisite high-end SAM solutions cannot.[49] The spectrum and cost of current solutions are fairly reasonable and range from $1,000 to $8,000 (multirotor interceptors – about $2,000 per unit; first-generation fixed-wing – $2,000; second-generation fixed-wing with onboard autonomy – between $5,000 and $7,000).[50] A $30,000-$80,000 Shakhed (depending on generation and payload)[51] or a $10,000 Gerbera that enjoyed the privilege of being intercepted by a $4.2 million PAC-3 Patriot missile[52] could now be downed by a disposable, cheap drone. And what has previously seemed like a reasonable strategy to double-bet on to bleed the adversary out of resources has quickly turned into a source of bleeding for the party that initiated this arms race in the first place.

Here, of course, we must acknowledge that the economy of interception or striking the target is defined not by the cost of interception and payload delivery per se, but also by the cost of the target being eliminated (or not), yet either way, one has to acknowledge that as of 2026, the calculus of war has been altered substantially and irreversibly.

Existing Solutions

The vendor ecosystem that emerged in Ukraine is already far more diverse than EDDI procurement assumes. Here, we'll consider just several of the many existing solutions to illustrate the breadth of approaches taken by different manufacturers.

Wild Hornets' Sting,[53] a 3D-printed multirotor at roughly $2,100 per unit reaching 280-340 km/h, has been Ukraine's top anti-Shahed interceptor[54] by monthly kill count for seven months running and recorded the first confirmed kill of the jet-powered Geran-3 variant in December 2025.[55] They were also among the

earliest adopters of remote-control system deployment, now allowing operators to work even from abroad (which will likely soon be scaled to all drone systems).[56] Skyfall's P1-Sun, also among the most well-known solutions, reaches 240 km/h with a 45 km range, has a 30-minute airtime, carries a 750g warhead, is compatible with a pneumatic catapult launch, and operates on radar-cued auto-detonation principles.[57] The high-speed version is now deployed via An-28 air platforms and reaches speeds up to 450 km/h[58] – Ukraine's Defense Ministry has confirmed over 3,000 Geran-class drone interceptions since January 2026.[59] The General Cherry's product line includes Bullet (slower targets), the Air Speed (reactive-jet variants), and a fiber-optic Optics. They also released a more recent solution – Strix – a 10-inch multirotor interceptor with a 400-500g warhead (it has only registered its first combat kills in Q1 2026).[60] However, it has received rather mixed feedback from operators and is not necessarily the most popular vendor in Ukraine.

Of course, outside Ukraine, the field is much broader than the public conversation suggests (at least openly). Sweden's Nordic Air Defense is producing the K100XR.[61] France's Atreyd is fielding kinetic interceptors.[62] Denmark's Terma and Odd Systems are integrating sensors and effectors.[63] Estonia's DefSecIntel and Latvia's Origin Robotics are scaling Baltic-origin systems.[64] And last but not least – semi-legendary Merops of Eric Schmidt[65] – the US-origin platform deployed under Eastern Sentry, which has been rather successful in terms of speed of adoption on NATO's Eastern flank.[66]

One may conclude that there is no shortage of interceptor designs and vendors. EDDI, therefore, does not need to split hairs trying to guess which one will be marginally better in a few months – it needs a detection architecture that any of these effectors can plug into.

Most of these solutions have yet to fully address the challenge[67] posed by reactive-jet drones[68] (such as the most recent modifications of the Shahed).[69] There are opinions that it will never be nearly as scalable as its earlier versions due to disproportionately higher costs and, therefore, less reasonable unit economics. And yet, so far, Russia has undeniably scaled its turbojet variants and the Molniya loitering munition at speeds and depths that propeller-driven interceptors struggle to engage.[70] Despite the Russian use of Starlink becoming less of a problem for Ukrainians who at some point suffered from painful middle-strikes[71] – depths of engagement of 35-40 kilometers inland still has become a new routine, as the

kill zone keeps expanding both ways. Current designs are split between attempts to achieve higher speed and the use of air-launch platforms. The procurement implication is that buying interceptors based on the 2025 threat profile will likely render them obsolete against the 2027 reality.

As the proverb has it, generals always prepare for the previous war, and European generals in 2026 do not seem to be an exception. The only reasonable solution that accounts for European bureaucratic realities might be to structure EDDI contracts in tranches, with explicit clauses requiring follow-on production to meet rising thresholds for speed, altitude, and engagement envelope.

Bottlenecks

All this being noted, European production capacity for interceptor drones remains substantially smaller than Russia's Shahed production and is completely dwarfed by Ukraine's (the latter, ironically, being the only side that has consistently demonstrated the ability to scale this category of weapon under combat conditions).[72] The €1.5 billion European Defense Industry Program adopted in March 2026 is a fair attempt at narrowing this gap – €700m IRA envelope, of which counter-UAS receives €80m directly plus shares of the €180m missiles line and €240m joint procurement.[73] And yet the math still does not quite work without Ukrainian production filling part of the demand curve through 2027. Domestic European primes can absorb the funding and add capacity over time, but as of today, the Build in Ukraine framework[74] and direct Ukrainian exports to frontline states remain the only mechanisms that can realistically supply effectors at salvo-defense rates within the IOC timeline. The following chapter considers the structural problem this creates in more detail.

Upon observing the evolution of drone warfare in Ukraine up close, one may conclude that interceptor drones do not really fit into the air defense command structures that European militaries are used to operating. As of 2026, reconnaissance and strike drone operations function as a de facto Mission Command, where crews of operators are assigned to defined zones, have long-standing tasks, and run autonomous hunting missions within delegated (and often very broad) authority. Classic air defense, in contrast, operates through a hierarchical structure. It generally has a dispatcher who authorizes (or prohibits)

action to avoid hitting friendly aircraft and prevent uncontrolled air combat, which would simply be an unavoidable luxury in a drone warfare world.

Thus, Ukrainian interceptor drone units recruited from "striker" backgrounds bring their habits and must painfully relearn elements of air-defense discipline. NATO militaries face the inverse problem: they bring hierarchical C2 to a domain where the effectors are cheap, distributed, and need to launch in dozens against a salvo (sometimes simultaneously, against a hundred or more incoming targets). Procurement does not really solve this because the problem is far broader and involves many more elements (including, but not limited to, training pipelines, crew certification, and delegated authority rules that need to be rewritten before the effectors even arrive).

Industrial and Political Economy

To put the matters raised in previous chapters into a tangible context, it is critical to identify the key nodes. Although it is the end product (the drone itself) that one typically associates with the overall battlefield success of the technology, in reality, it is predominantly about everything what comes way before the engagement with targets. After all, it is industrial bases, years of research, and decade-long supplier relationships that enable the killchain and define its constraints and efficacy, and not just the pilot or a drone itself[75] (that may evolve completely every several months).

EDDI doesn't directly address these and generally ignores even basic interoperability issues. To understand the existing approaches to deal with this architecture, three main components of the European counter-UAS ecosystem will be considered: the Ukrainian export regime (rather slow, fragmented, but the only combat-validated supplier at scale), the European prime contractor base (very well-capitalized, politically connected, but years away from comparable products), and the frontline member states (operationally desperate and fiscally committed, but procedurally outranked by Brussels and the larger EU capitals). Whichever combination prevails will likely determine what EDDI eventually delivers (and, just as importantly, what it won't).

Ukraine

Over the years since the full-scale invasion began, Ukraine has built up both production capacity and combat data necessary for effective R&D, with a developer-user-developer feedback loop as short as several hours. The export regime for drone technology, however, is lagging, and despite consistent promises to reconsider existing export policies, it has not yet reached a point where it might satisfy even neighboring markets. The DSECU commission, which handles and approves all defense export inquiries,[76] is merely a 17-person body that includes representatives from 15 governmental agencies. Currently, it operates on roughly 90-day approval windows (which, given realities of the modern warfare dynamics, is exceptionally slow). As of early 2026, it had processed only 80 export applications.[77]

Of not too many major success stories – a German-Ukrainian Quantum-Frontline Joint Venture is a good working example.[78] However, the entirety of its production output is currently directed back to Ukraine, with the path toward European supply conditioned on eventual loosening of the export regulations.[79] The "Build in Ukraine" framework[80] is still under development, but early drafts assume it would require at least 50% of joint-venture production output to be supplied to the Armed Forces of Ukraine.[81] Which is, of course, reasonable from Kyiv's perspective, but a rather substantial constraint for any partner government that attempts to build a stockpile for its own needs. A telling indicator of how these bureaucratic processes jeopardize Ukrainian opportunities took place in 2024. In 2024, Lithuania's Ministry of Defense proposed a Baltic interceptor production hub, but Ukraine's response was so slow that the Baltic states eventually pivoted to building their own sea drone production lines instead.[82]

The lesson, painful as it is, is that securing demand for Ukrainian drone capability does not wait for excruciating Ukrainian bureaucracy (that, despite fundamental improvements and relative flexibility achieved since the beginning of the full-scale invasion, continues to be rather constrained by the intra-political dynamics on matters related to the export of military technology and products).[83] EDDI cannot fix this, of course, but it may structure incentives that pull the governmental actors in Ukraine towards the right direction.

European Union

The European suppliers certainly are making substantial efforts to establish their presence on the market and seize the opportunity. Helsing, MBDA, Diehl, Rheinmetall, and Saab can absorb EDF and EDIP funding[84] and gradually scale production capacity, particularly if the procurement framework would reward European producers[85] (broadly achieved by EDIP's 65% EU/associated-country content rule[86]). In June 2025, Helsing raised €600 million in Series D funding[87] and, alongside Stark, secured a major €268 million Bundeswehr drone contract.[88] In early 2026, Rheinmetall and MBDA formed a joint venture to develop naval laser counter-UAS effectors in response to a German Navy request.[89] States neighboring the primary source of European concerns offer a different set of solutions (Polish PGZ[90] and WB Group, Estonian Milrem, Latvian Origin Robotics, Finnish Patria) and bet on operational urgency overriding European procurement orthodoxy, therefore focusing on delivering combat-proven

solutions. Both camps have legitimate claims, and both certainly have strong political backers in Brussels as well. Naturally, this spectrum of approaches implies conflicting interests.

A euro invested in an EU-Ukraine joint venture is a euro not routed directly to Ukraine. And even at a more granular level, an engineering standard set in Stockholm or Tallinn is one that Paris and Berlin did not set. Despite its colloquial interpretations, the drone wall is not a single procurement program but a set of competing visions of what European MIC must look like. And currently, it shares nothing more than a line in the budget and a press release.

Coherence

The NATO dimension doesn't make the alignment problem any easier, as the operational coalition does not match the funding coalition. Today, the majority of key Eastern Sentry[91] assets (Typhoons, F-35s, AWACS, refueling aircraft) patrol NATO airspace from forward bases in Poland, Romania, and the Baltic states, and depend on contributions from, among others, the United Kingdom[92] and (looking forward) Canada – note that neither can access EDIP funds.[93] This creates another potential point of friction and overcomplication, where EDDI is supposed to handle procurement, Eastern Sentry would be responsible for operations, NATO will keep playing the role of deterrence, and amid this entire bureaucratic spaghetti, somewhere in the middle, the same Polish radar operator is supposed to identify a Russian drone, cue an interceptor that may have been built in Latvia or Sweden or Munich, and on top of this – coordinate with a Norwegian F-35 pilot already on combat air patrol. This may work when the opponent deploys a handful of drones, but it is not hard to see how it could become a problem at scale.

The concern, therefore, is less that EDDI will deliver than that it will deliver exactly what the political-industrial economy of Europe currently incentivizes (a heavily fragmented, partially interoperable, prime-contractor-friendly capability that becomes operational around the same time the threat profile moves on). To avoid the swamp of EU bureaucracy, Brussels would need to use all the leverage it has, including, but not limited to, partnerships with Ukraine[94] (and expanding existing joint ventures opportunities[95]) and bending the MIC toward what the operational picture requires, rather than accommodating the isolated and conflicting national interests of member states.

Recommendations

A set of three recommendations may be offered for the Directorate-General for Defense Industry and Space.[96] They are limited in scope to fit the realistically available instruments that the Directorate-General already controls – none of them require Council unanimity, and none attempt to legislate areas that have been historically difficult to enforce. In drafting these, practicality and feasibility were prioritized above mere convictions and distant aspirations.

Open API Conditioning

Any efforts related to counter-UAS R&D and radar/detection systems that are funded through EDIP must be obliged to publish open application interfaces (including but not limited to sensor cueing, C2C integrations, engagement, and other types of reporting) and offer FRAND[97] licensing terms to other EDIP-funded recipients. It may not be under the direct commission's umbrella to draft technical standards, and should not attempt to do so, which would be a huge mistake (as the state is not nearly capable of keeping up with a quickly evolving field). It must not seek uniformity but rather enforce openness. Every funded vendor must publish (and license) its own interfaces as a prerequisite to accessing funds. This will allow integration to emerge through market pressure, as customers will naturally reward vendors whose systems work with others over those that are too hard to deal with.

The enforcement mechanism will not require reinventing the wheel, as it would, de facto, be guided by the same principles that underpin the existing 65% rule[98] – the very same authority envelope. It won't invoke Article 346[99] TFEU opposition (as it doesn't regulate tech specs and is limited to only documentation and licensing) and doesn't retroactively touch existing contracts (so there should be no opposition from industry, such as the Kongsberg-PGZ SAN program or the Helsing-Stark Bundeswehr deal[100]). It assumes that the new EDIP funds would be granted only to vendors willing to interoperate.

Of course, one might argue that open APIs in isolation won't, by themselves, result in a fusion architecture. And they surely will be correct. And yet the fusion architecture may only emerge from the catalysis of market pressure, which does

require the preconditions this recommendation addresses. Should this not be implemented, the EU will likely fall into the same set of troubles the Ukrainian industry had to cope with, and the procurement cycle will likely lock in around proprietary interfaces, which would eventually reduce the total product offering, R&D speed, and the potential for future solutions.

IP Licensing Terms

As the risk of the EU engaging with Russia's growth, and as Ukraine continues to integrate into the European defense architecture, a set of steps could be taken to expedite this process and address points of friction and conflicts of interest. DG DEFIS must condition the €260+ million Ukraine Support Instrument under EDIP[101] on three licensing provisions.

First, Ukrainian vendors receiving USI funding must offer non-exclusive licenses to frontline EU armed forces (Poland, Lithuania, Latvia, Estonia, Finland) at production cost plus a defined margin (the exact formula is up for debate).

Second, any detection software and ML training datasets aggregated under USI-funded programs must be jointly owned by Ukrainian companies and the EU.

Third, the Build in Ukraine 50% donation rule,[102] should it be implemented as is, to include exceptions for direct frontline-state procurement of USI-funded systems below a defined contract threshold.

This would not, by any means, limit Ukrainian manufacturers' access to EU funds, but will enforce a higher level of co-integration and expedite broader European integration. Of course, it would be fair to expect that Kyiv will resist this development (that's why current review cycles are as long as 90 days, after all). Yet Kyiv's negotiating position has substantially strengthened over the last eighteen months, which may result in certain procurement preferences being granted to situational partners in the Middle East, for instance, rather than the European Union, despite the latter offering generous capital investments, unprecedented market access, and accelerated EU candidate status. This push would help ensure a smooth co-integration of the Ukrainian defense architecture into the broader European umbrella.

Dedicated Procurement Tracks

The joint-procurement programs for counter-UAS under EDIP[103] must be split into two distinct tracks. First, the accelerated track must include consortia of frontline member states (states sharing a border with Russia, Belarus, or the Black Sea littoral). This group must be offered simplified consortium requirements, including, but not limited to, shortened evaluation cycles and an explicit preference for combat-proven systems. The standard track, however, may continue to operate under existing EDIP procedures (and is open to all EU member states).

Frontline states must be offered faster access to EDIP funds (especially for counter-UAS). It would be fair to expect resistance from Paris and Berlin, of course, but the assumption is that it could be mitigated. A potential compromise might be achieved through smaller per-project caps[104] and/or tighter timelines under the expedited procedures for the Eastern flank member states. This, by design, should keep major EU defense industries predominantly focused on the standard track, as the recommendation aims to offer a fast lane for the small number of instances where speed is particularly critical.

Implementation Risks

The recommendations from the previous chapter assume a rather permissive scenario. It would be reasonable, therefore, to consider three contingencies (any of which is fairly plausible as of mid-2026) that might change the calculus.

Russian Pivot

Since late 2025, there has been an increasing amount of evidence that Russia is attempting to integrate GPS spoofing and electronic warfare solutions into Shahed and Geran-3 drones.[105] Should this trend continue well into 2027, the detection layer might become the operationally fragile part of the kill chain. The autonomous, computer-vision-guided interceptors that EDDI is most likely to fund (including TYTAN's Interceptor-S, Origin's BLAZE, and the Quantum-Mozaic family) do not depend on GPS/RF datalinks for terminal guidance. However, their efficacy depends on the detection layer's signature libraries (radar, RF, acoustic) to keep up with evolving Russian emissions and comms protocols.

This would substantially shift the weight of Recommendation 2, as it will drastically increase the importance of the detection-layer data emerging from ongoing Ukrainian operations (radar signatures, RF profiles of jammed and unjammed UAVs, acoustic libraries from frontline crew encounters, etc).[106] Effectively, these might matter even more than the hardware IP.

US Disengagement

As the Pentagon continues shifting its focus to the Indo-Pacific and given the most recent US National Security Strategy published under the Trump administration,[107] it would be reasonable to expect resources to be drawn down from Eastern Sentry assets.[108] This might create gaps in AWACS capabilities, refueling, and C2 redundancy, which currently make Eastern Sentry robust and functional. The escalation of these developments might create substantial challenges for Recommendation 3. As the idea behind the procurement coalition was to support the operational coalition, which currently includes substantial US assets, the depletion of those assets might create additional frictions within the EU regarding their willingness to offer shortcuts to the frontline states.

Brussels, of course, wouldn't be able to replace US assets instantly, but it may structure the accelerated EDIP track in Recommendation 3 to favor vendors whose systems work in degraded sensor environments, which would help to partially mitigate this risk.

EU Misalignment

Should EU-skeptics (arguably, Slovakia[109] or, since recently, Bulgaria[110]) be supported by a swing vote from Italy or Spain (both are currently inside the EDIP coalition and both have domestic political dynamics that could shift mid-cycle – the 2027 French presidential cycle is already affecting Paris's positioning,[111] and Berlin's coalition arithmetic remains fragile after the 2025 Bundestag election[112]) – this would inevitably fracture the Recommendation 3.

The mitigation option might be delivered through the certification authority and stockpile-management roles, which would be offered to Italy and Spain privileges within the standard track. To handle it proactively, their procedural status must be sufficiently visible that walking away from EDIP costs them substantial political and financial capital.

Deterrence effects

Considering all these risks, it would be fair to note that, despite all obstacles, EDDI's funding has already shifted the European supplier base toward distributed production (all major players are already scaling, regardless of whether Brussels puts much effort into their coordination). And, more importantly, the visible counter-UAS capability of frontline states is itself acting as a deterrent – Russia does notice Poland's SAN program, the Baltic's BLAZE-EIRSHIELD, and the opening of Frankenburg's Mark I production lines. Clearly, deterrence does not require perfect coordination per se. That said, the core brief's argument is that better coordination would increase the likelihood that this deterrent will be effective, and that the EU now has levers to do so with rather limited additional risks or effort.

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