A Rampart of Drones to Defend Europe

A Plan for the New European Commission and High Representative

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● Summary

Drones are currently at the heart of many key challenges to European security. A European Union (EU) drone production and procurement plan launched by the European Commission and High Representative could have several simultaneous objectives:
- strengthening Ukraine's capabilities in an increasingly crucial category of military equipment,
- stimulating the adaptation of the European Defence Technological and Industrial Base (EDTIB) to a major military revolution, and
- preparing NATO's European pillar to face up to the challenge of massification and the risk of a US pivot towards Asia.

This threefold reinforcement of Ukraine, the EDTIB and NATO's European pillar would constitute what might be called Europe's 'rampart of drones'.

● Introduction

Europeans states are currently pursuing two main strategic objectives: helping Ukraine counter Russian aggression and strengthening Europe's Eastern flank to deter or prepare for a possible future Russian attack. However, this context is marked not only by Russia's quantitative lead in the production of critical expendable equipment, such as ammunition,[1] but also by the risk of declining US support as well as financial constraints at both the EU and national levels.

To help square this circle, the European Commission and High Representative should launch an ambitious joint drone production and procurement plan. The aims would be the following:

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[1]   Katie Bo Lillis, Natasha Bertrand, Oren Liebermann and Haley Britzky, 'Exclusive: Russia producing three times more artillery shells than US and Europe for Ukraine', *CNN*, 11 March 2024.

- **strengthen Ukraine**'s military capabilities against Russia by bolstering the innovation and production capacities of its domestic drone industry as well as promoting closer cooperation with the EU defence industry,

- **stimulate the innovation efforts** and competitiveness of the EDTIB by linking it to the Ukrainian 'laboratory', thus allowing promising prospects to be identified more effectively and new solutions to be tested rapidly under high-intensity combat conditions,

- propose new cooperative and agile solutions to enable European NATO member states to rapidly **strengthen their Eastern flank** with a critical mass of weapons capable of blocking potential Russian aggression, even if US military capabilities were to become less available, and

- simultaneously keep **spending under control** by taking advantage not only of the economies of scale generated by joint procurement, but also of the relatively low cost of unmanned vehicles compared to traditional platforms.

I . The drone revolution

Military experts have long focused their attention on the larger and more expensive medium-altitude long-endurance (MALE) drones employed most notably by the US in asymmetric warfare. This has led in particular five EU member states to jointly develop since 2018 a MALE 'Eurodrone' as part of a permanent structured cooperation (PESCO) project. Smaller, cheaper drones have not been completely ignored, but they were mainly treated as weapons enabling non-state actors to threaten Western armies. However, the war in Ukraine has put the spotlight on the innovative use of small, expendable and relatively cheap drones in

the context of high-intensity interstate war.[2] This development has surprised many observers because it has led states with relatively advanced militaries to emulate, through bottom-up battlefield learning and adaptation, practices thought to be reserved for weaker insurgencies with limited capacity.[3]

Drones are currently being used by both the Ukrainians and the Russians as intelligence devices, i.e. to improve battlefield transparency for frontline soldiers and the accuracy of artillery strikes, but also as munitions to diversify the options available for precision strikes. Whereas the essential quality of the large drones used in anti-terrorist operations was their endurance, which enabled them to wage war at a distance, the context of high-intensity interstate warfare places greater emphasis on other qualities. Two key advantages of drones now stand out: relatively **low unit costs**, which allow them to meet the requirements of a protracted war of attrition in which quantity is a crucial factor, and relatively **short production cycles**, which allow rapid innovation and agile adaptation.[4] These advantages are positioning the drone at the centre of the industrial defence production battle between Russia and Ukraine, both in terms of quantity and quality.

At the tactical level, one of the main lessons of the war in Ukraine is that drones are most effective when used **in conjunction with other weapon systems**. Drones have proven particularly useful for spotting and immobilising moving targets and guiding howitzer fire, but they cannot by themselves match the firepower of a salvo of artillery shells.[5] The drone revolution is therefore less about replacing traditional platforms with drones than about systematically equipping infantry platoons, artillery batteries, battle tanks, combat aircraft or surface vessels with drone and anti-drone systems. In other words, we have entered an era of **drone-centric combat**.

2   Dominika Kunertova, 'Drones have boots: Learning from Russia's war in Ukraine', *Contemporary Security Policy*, 44:4, 2023, 576-591.

3   Kerry Chávez and Ori Swed, 'Emulating underdogs: Tactical drones in the Russia-Ukraine war', *Contemporary Security Policy*, 44:4, 2023, 592-605.

4   Marc R. DeVore, '"No end of a lesson:" Observations from the first high-intensity drone war', *Defense & Security Analysis*, 39:2, 2023, 263-266.

5   Stacie L. Pettyjohn, 'Drones are transforming the battlefield in Ukraine but in an evolutionary fashion', *War on the Rocks*, 5 March 2024.

The widespread use of drones tends to increase the **transparency of the battlefield** at the tactical level and the **precision of indirect strikes**, making any concentration of forces easier to detect and destroy, and thus surprise more difficult to achieve.[6] A clear symptom of this trend is the withdrawal of some traditional platforms from the front line, be they main battle tanks, which are deemed too vulnerable to aerial drones,[7] or surface vessels, which are vulnerable to maritime drones.[8] Conversely, drones have stimulated the proliferation of lighter, less visible vehicles, such as motorcycles.[9]

The classic plan of concealing a mass of forces to attack one of the enemy's weak points and make a breakthrough tends to become not only more difficult to implement but also more dangerous. This development seems to confirm theoretical tactical hypotheses formulated at the beginning of the century, according to which, in terms of transparency, the conduct of war would progressively become less like the game Battleship and more like chess.[10] The objective would then be less to concentrate one's forces against an enemy's weak point than to **force the adversary to regroup** their own forces in a vulnerable location where they can easily be destroyed with drones and indirect strikes.

However, the **Ukrainian Kursk offensive** of August 2024 demonstrated that surprise can still be achieved, largely thanks to the skilful use of jammers, which initially neutralised Russian drones and surveillance capabilities, and the massive deployment of bomber drones, which offered less visible fire support than a concentration of artillery batteries.[11] This seems to indicate that '**drone dominance**' is becoming a crucial condition for regaining freedom of manoeuvre on the ground.[12]

II . Strengthening Ukraine

Drones are essential not only for holding the front line against Russian offensives but also for offsetting Russia's advantage in artillery ammunition.[13] As President Zelenskyy put it, 'Repelling ground assaults is primarily the task of drones. The large-scale destruction of the occupiers and their equipment is also the domain of drones'.[14] As such, drones are at the heart of the Ukrainian war effort. In 2023, it was estimated that Ukraine consumed 10,000 drones per month.[15] According to Mykhailo Fedorov, Ukrainian Minister of Digital Transformation, the country's drone production grew 120 times larger in 2023.[16] Almost all the drones used by Ukraine's armed forces are produced domestically, mainly by the private sector, which grew from just 7 companies in 2022 to more than 200 in 2024.[17] The Ukrainian government hopes that the country will soon be able to produce 2 million drones per year.[18]

6   Franz-Stefan Gady, 'How an army of drones changed the battlefield in Ukraine', *Foreign Policy*, 6 December 2023.

7   Tara Copp, 'Ukraine pulls US-provided Abrams tanks from the front lines over Russian drone threats', Associated Press, 26 April 2024.

8   Yuliia Dysa, 'Ukraine says Russia's last naval patrol ship leaving Crimea', Reuters, 15 July 2024.

9   Alistair Macdonald and Ievgeniia Sivorka, 'Ukraine uses beach buggies, e-bikes to evade Russian drones', *The Wall Street Journal*, 22 June 2024.

10   Guy Hubin, *Perspectives tactiques*, Paris, Economica, 2000, p. 39.

11   Stéphane Audrand, 'Le tournant de Koursk : 10 points sur l'offensive ukrainienne en Russie', *Le Grand Continent*, 16 August 2024.

12   David Hambling, 'Ukraine's Kursk offensive blitzed Russia with electronic warfare and drones', *Forbes*, 9 August 2024.

13   Franz-Stefan Gady and Michael Kofman, 'Making attrition work: A viable theory of victory for Ukraine', *Survival*, 66:1, 2024, 21.

14   President of Ukraine, 'I signed a decree initiating the establishment of a separate branch of forces – The Unmanned Systems Forces', 6 February 2024.

15   RUSI, 'Russia and Ukraine are filling the sky with drones', 30 August 2023.

16   Tom Balmforth, 'Ukraine to produce thousands of long-range drones in 2024, minister says', Reuters, 12 February 2024.

17   Government of Ukraine, 'Prime Minister: Our key task is to intensify production of drones, ammunition and other modern weapons', 1 February 2024.

18   Alexander Khrebet, 'Defense Ministry: Nearly all of Ukraine's drones domestically produced', *The Kyiv Independent*, 1 June 2024.

But the challenge is not just quantitative – it is also qualitative. Since 2022, the Ukrainians and Russians have been engaged in an extremely fast-paced race of drone innovation. Innovation cycles are very short, and it is not unusual for a new Ukrainian technology to arrive on the front line, only to find that the Russians are already developing countermeasures that will render it obsolete. A typical example of this dynamic is the Turkish Bayraktar drone, which played a major role in the first few weeks of the full-scale invasion before virtually disappearing from the battlefield.[19] In response to this dynamic environment, the Ukrainian government has introduced accelerated and simplified administrative procedures to minimise the time between the emergence of a new good idea and its potential implementation on the front line. Current innovation challenges include the development of artificial intelligence (AI)-powered autonomous drones able to resist jamming attacks,[20] drone swarms,[21] ground drones,[22] anti-drone laser beams,[23] battering-ram drones[24] and drone interceptors.[25]

In this context, initiatives have already been launched by Ukraine's partners not only to supply Western-manufactured drones to the Ukrainian armed forces, with a UK and Latvia-led drone alliance consisting of 14 states,[26] but also to directly invest in the production of drones by Ukraine's domestic industry.[27] Yet this approach could be further systematised.

The new European defence industrial strategy (EDIS) opens up the possibility of extending EU support to the Ukrainian defence industry and calls for a particular focus on drones.[28] The EDIS suggests supporting the ramp-up of drone production via EU-budget-funded Commission instruments and drone purchasing for Ukraine via the off-budget European Peace Facility (EPF).

A comprehensive EU drone plan for Ukraine could be implemented as follows:

• The EU should support the **ramp-up of Ukrainian domestic drone production**.[29] The rapid proliferation of Ukrainian drone manufacturers has stimulated a wealth of innovation, but it also means that many of these companies rely on small-scale, artisanal production. As a consequence, Russia has taken the lead in the drone battle thanks to its massive industrial production capacity. It is therefore crucial to help Ukrainian companies scale their production.[30] This should be a priority task for the European Defence Industry Programme (EDIP).

• In addition, EU actions should encourage **cooperation and joint ventures between Ukrainian drone manufacturers and the EDTIB** to facilitate Ukrainians' access to sophisticated technologies and help them win the race for innovation against Russia. The new EU Defence Innovation Office in Kyiv should help the EU identify the needs of the Ukrainian drone industry and the

19 Ellie Cook, 'Why Ukraine's once-feared Bayraktar drones are becoming obsolete', *Newsweek*, 2 November 2023.

20 Ellie Cook, 'Ukraine's AI drone gamble', *Newsweek*, 4 April 2024.

21 'Ukraine's tech hub develops AI-driven drone swarms to combat Russian forces', *Kyiv Post*, 24 June 2024.

22 Jack Detsch, 'Ukraine goes all-in on ground robots', *Foreign Policy*, 17 July 2024.

23 Gianluca Sarri, 'Drone-zapping laser weapons now effective (and cheap) reality', *The Conversation*, 22 January 2024.

24 Emmanuel Grynszpan, 'La chasse aux drones russes, le nouveau défi de l'armée ukrainienne', *Le Monde*, 28 July 2024.

25 David Hambling, 'Ukraine fields FPV interceptor drones at speed', *Forbes*, 2 July 2024.

26 Elisabeth Gosselin-Malo, 'Latvia-led drone coalition for Ukraine gains more funding, members', *Defense News*, 17 June 2024.

27 Government of Canada, 'Minister Blair announces additional military assistance for Ukraine at the 21st meeting of the Ukraine Defense Contact Group', press release, 26 April 2024.

28 European Commission and High Representative, 'A new European Defence Industrial Strategy: Achieving EU readiness through a responsive and resilient European Defence Industry', JOIN(2024) 10 final, 5 March 2024, pp. 17-18.

29 Jan Joel Andersson and Ondrej Ditrych, 'Made in Ukraine: How the EU can support Ukrainian defence production', *EUISS Brief*, N° 5, April 2024.

30 Stacie L. Pettyjohn, 'Drones are transforming the battlefield in Ukraine but in an evolutionary fashion', *op cit.*

potential synergies and opportunities for cooperation with the EU industry.[31]

- Because the Ukrainian government's financial resources are limited, the orders it places with the drone industry are sometimes not renewed from one year to the next, while contracts may be delayed.[32] This problem tends to hamper the ramp-up of production and limit companies' capacity to invest in innovation. The EU should thus use the EPF – or a similar off-budget instrument – not only to support the Ukrainian armament effort, but also to **make drone procurement from Ukrainian and EU companies more regular and predictable**, thereby giving the industry greater medium-term visibility. If Hungary's veto were to prohibit the use of the EPF, a special multiannual fund for drone procurement could be set up by willing member states as a PESCO project.

III • Strengthening the EDTIB

Before the full-scale invasion in 2022, Europe was lagging behind the US in the development of military drone technologies, with many European armies preferring to buy from US or Israeli companies.[33] Although the Ukraine war has encouraged Europeans to take the role of drones in modern warfare more seriously, investment remains too limited, and cooperative initiatives among EU states too rare.[34] An EU plan to support drone production for Ukraine would be an opportunity to give the sector a boost.

To begin with, the EU defence industry would greatly benefit from being more closely associated with the **Ukrainian innovation 'laboratory'**. The benefits include direct access to feedback from the front line, the ability to rapidly test new equipment with minimal red tape in Ukraine and the full integration of innovative Ukrainian technologies into the EU defence industry supply chain.[35] Making Ukraine a hub for the European drone industry could even facilitate cooperation among the EU companies themselves.

Second, the massive procurement of drones for the benefit of the Ukrainian war effort could help solve a conundrum. The very short innovation cycles currently observed in the sector mean that some European armies are reluctant to stock drones for fear that the models they purchase today will become obsolete in a few years or even a few months.[36] This reluctance could eventually slow down the development of the EU drone industry and add to its lag. Making drones for Ukraine, where they are immediately useful in combat, is thus an opportunity to circumvent this problem. Procuring drones for Ukraine today is the best way to **push EU manufacturers to develop their know-how**, acquire machines and hire qualified personnel to eventually become more productive and competitive in this sector. Even if the models produced today do quickly become obsolete, these structural capabilities would remain essential for producing future generations of drones in Europe.

While the link between providing immediate support for Ukraine and strengthening the EDTIB also exists for other expendable equipment, such as ammunition, the advantage of the drone sector is its highly innovative nature. For example, while the production of 155mm artillery shells in Europe is important in terms of security of supply, it is not based on new or sophisticated technologies. In economic terms, traditional munitions are thus relatively 'commoditised'.[37] In contrast, the production of innovative drone and anti-

31 Kateryna Hodunova, 'EU Commissioner: EU begins work on new Defense Innovation office in Kyiv', *The Kyiv Independent*, 6 May 2024.

32 Tamar Jacoby, 'How Ukraine's drone industry took flight', *Foreign Policy*, 6 July 2024.

33 Dominika Kunertova, *Military Drones in Europe: The European Defense Market and the Spread of Military UAV Technology*, Center for War Studies, 2019.

34 Federico Borsari and Gordon B. 'Skip' Davis Jr., 'Drones are changing warfare — The EU needs to catch up', *Politico Europe*, 26 December 2023.

35 Heidi Crebo-Rediker, 'Coming to Ukraine's defense: Leveraging the European Investment Bank for Ukrainian drone manufacturers', Council on Foreign Relations, 15 July 2024.

36 Rudy Ruitenberg, 'Small drones will soon lose combat advantage, French Army chief says', *Defense News*, 19 June 2024.

37 Jonathan Caverley and Ethan Kapstein, 'Commoditized weapons in Ukraine: Are the Allies getting the procurement right?', *War on the Rocks*, 24 August 2023.

drone systems is likely to **create high-quality jobs and provide a base for new disruptive technologies**. This seems particularly true of the development of smart drones, which could contribute to making up for Europe's investment deficit in AI technologies.[38]

Third, by intervening at an early stage of the small-drone revolution, when rival national standards have not yet crystalised, EU–Ukrainian cooperation could encourage the **emergence of common European standards**. The aim would be not to select standardised models of entire drones, which would contravene the logic of constant innovation and rapid adaptation, but to encourage the emergence of **standards of interoperability and interchangeability**. Not only should drones of different models be able to cooperate easily – e.g. fly in swarms – but new modules, such as an upgraded radio, camera or warhead, should be easily attachable to an existing drone body, thus facilitating adaptation to new battlefield challenges.

Following this **dynamic modular approach**, each drone could be designed less as a monolithic platform and more as an integrated system of different modules, each of which could be regularly updated to respond to the latest countermeasures.[39] This approach could help overcome European armed forces' fear of drones' rapid obsolescence. It would also help to **keep costs down**, as makers could upgrade a drone by modifying just one of its modules, rather than having to replace the whole unit. In addition, interoperability standards among companies would allow **small and medium-sized enterprises to participate more easily** in production chains or updating procedures, thus facilitating transnational cooperation in Europe.[40]

IV. Strengthening the European pillar of NATO

A plan for EU investment in drone production and procurement should also help strengthen NATO's ability to defend its Eastern flank against Russia. The Russian army is increasingly integrating drones into its operations and military culture.[41] **A potential Russian attack on NATO would thus likely make extensive use of all kinds of drones**. Learning to fight with and against the latest generations of drones and anti-drone systems should therefore be a priority for NATO forces. Close EU–Ukraine cooperation on drone production could both provide the industrial capacity for a rapid ramp-up in the event of a direct war with Russia and help spread the culture of modern drone-centric warfare within NATO's armies.

Moreover, drones could help NATO forces **respond to the problem of mass**. While NATO has adopted ambitious plans to be able to respond with substantial forces to attempted Russian aggression,[42] doubts are emerging about the ability of its member states to field sufficient troops.[43] Interestingly, the Ukrainians are currently seeking to compensate for the Russians' numerical superiority by relying not only on aerial drones but also on ground robots.[44] Similarly, in the event of conflict in East Asia, the US Pentagon plans to rely on the massive production of all-domain drones to be able to overcome the Chinese People's Liberation Army's 'advantage in mass', using the slogan 'small, smart, cheap, and many'.[45] Following the same logic, developing 'armies of drones' in Europe could provide NATO with a critical mass of forces capable of coping with the growing Russian army.[46]

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38   European Court of Auditors, 'Artificial intelligence: EU must pick up the pace', 29 May 2024.

39   Justin Bronk and Jack Watling, *Mass Precision Strike: Designing UAV Complexes for Land Forces*, RUSI Occasional Paper, April 2024, pp. 38-39.

40   Rodger Hosking, 'Why MOSA matters: How MOSA is shaping the future of unmanned systems', *Military Embedded Systems*, 7 March 2022.

41   David Hambling, 'Is Russian drone production overtaking Ukraine?', *Forbes*, 1 July 2024.

42   John R. Deni, 'The new NATO Force Model: Ready for launch?', *NDC Outlook*, No. 4, May 2024.

43   Jack Detsch, 'NATO doesn't have enough troops', *Foreign Policy*, 10 April 2024.

44   Jack Detsch, 'Ukraine goes all-in on ground robots', *op cit*.

45   US Department of Defense, 'Deputy Secretary of Defense Kathleen Hicks' remarks: "Unpacking the Replicator initiative" at the Defense News Conference', 6 September 2023.

46   Benjamin Jensen, 'Raising an army of drones', Center for Strategic and International Studies, 8 July 2024.

While the joint purchase of drones through EU funding – be it an adapted EPF or a new PESCO project – should initially be primarily aimed at strengthening Ukraine, it could also **help member states equip their own armies collaboratively**. Indeed, in the same way that they facilitate production at scale and rapid adaptation, common standards, developed in close partnership with NATO, should be encouraged to strengthen **interoperability among allies**. Ideally, drones from different allied countries should be able to easily share information with each other, synchronise their actions or incorporate interchangeable modules.[47]

Interoperable European 'armies of drones' would not be useful only for countering Russia. Even in the South, European navies are increasingly confronted with drone warfare, as shown by the Houthi attacks in the Red Sea.[48] In this context, one of the main problems is that defensive weapons are effective but much more expensive than the offensive drones used by the Houthis. Learning to develop cost-effective drone and anti-drone systems is therefore also crucial in asymmetric overseas conflicts.

Additionally, an EU plan could capitalise on another advantage of drones: their short production cycles. Indeed, beyond the war in Ukraine and overseas crises, a major risk for Europe is the potential outbreak of war in East Asia, which would force the US to refocus most of its resources far from Europe.[49] Russia would then be tempted to exploit this opportunity and the difficulty for the US of engaging simultaneously on two fronts. In response, Europeans would have to be able to swiftly adapt NATO's regional plans to deter or even repel Russia with limited US support. In such a crisis, a massive and accelerated acquisition of traditional platforms, such as combat aircraft, would probably be difficult and costly to achieve. Drones, on the other hand, would offer a quick and affordable solution, as millions of units could be rapidly produced. For example, the main objective of the US Replicator programme is precisely for the Pentagon and US industry to acquire the capacity to produce massive quantities in a very short timeframe of 18 to 24 months.[50] A European drone plan could likewise use the support for Ukraine as a driving force to **give the EDTIB the production agility to be able to respond to an abrupt US pivot towards Asia**.

• Conclusion

The combination of a Ukraine capable of winning the drone battle against Russia, an EDTIB capable of quickly mass-producing innovative drones, and a readiness among member states to deploy interoperable drone forces on the Eastern flank would provide for the defence of Europe a 'rampart of drones'.

To this end, the European Commission's mission should be to use its industrial instruments financed by the EU budget – particularly the EDIP – to support the ramp-up of Ukrainian production, encourage industrial partnerships between Ukrainian and EU companies and promote standardisation and modularity in drone production and upgrading. The High Representative and the External Action Service would have the task of setting up a multiannual off-budget fund for the purchase of drones – within the EPF or via a new PESCO project – to support Ukraine's immediate acquisition capacity and prepare member states to jointly defend NATO's Eastern flank with interoperable armies of drones.

Overall, this plan gives substance, at the level of the defence industry and military capabilities, to a crucial argument that the EU has put forward at the political level since 2022 – Europe's security depends on the fate of Ukraine. Indeed, if they want

47 Tyler Jackson, 'Thinking big with small drones: An allied approach to swarming', *War on the Rocks*, 23 March 2023.

48 Kevin McCranie, 'Houthi attacks in the Red Sea: A new twist on the Jeune École?', *War on the Rocks*, 16 April 2024.

49 Camille Brugier and Pierre Haroche, '2027: The year of European strategic autonomy', Groupe d'études géopolitiques, April 2023.

50 Noah Robertson and Courtney Albon, 'Replicator drones already being delivered, Pentagon says', *Defense News*, 23 May 2024.

to adapt their industries and armed forces to the drone revolution, and if they want to develop the mass and agility that will enable them to confront Russia, even with declining US support, the best option for Europeans is to start building a 'rampart of drones' *for* and *with* Ukrainians.

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