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MINDING THE DRONE GAP

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Drone warfare and the EU

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Artillery dominates the war in Ukraine, but is the drone fast replacing it as the 'King of Battle'? Ukraine's military leadership suggested as much in May 2024, stating that 'drones kill more soldiers on both sides than anything else'[1]. Drones have become ubiquitous in conflicts all around the world, from the wars in Ukraine and Gaza/Israel/Lebanon to the civil wars in Sudan, Syria and Myanmar. They are also increasingly deployed by non-state actors across the Middle East and Africa. While some argue that this represents a revolutionary shift in warfare, others see it as more of an evolutionary development. However, the broader implications and conclusions to be drawn remain a subject of debate[2]. So, what is the impact of drones on modern warfare? And how should the EU respond?

Summary

- As the EU Member States ramp up arms production in support of Ukraine and for their own defence, the proliferation of armed drones and countermeasures is a growing concern. This poses important questions for the future of warfare and the European defence industry.
- The impact of drones varies significantly however depending on their type, highlighting the need for a clear definition of the term. Furthermore, the effectiveness of countermeasures significantly influences the extent to which drones can impact military operations and civilian infrastructure.
- The EU can support Ukraine's drone warfare efforts and build its own drone and counter-drone capabilities by leveraging the Union's strengths: a strong and innovative industrial base, close cooperation with Ukraine, and a burgeoning EU defence industry policy.

DEFINING DRONES

In the military, 'drone' used to be a term for remotely controlled aircraft utilised for gunnery practice. Today, the term 'drone' encompasses a wide range of devices, from inexpensive weaponised recreational multicopters to uncrewed jet-sized aircraft used for intelligence, surveillance and reconnaissance (ISR)

that can cost millions. In Ukraine, both sides daily deploy thousands of drones of all sizes and types. Aerial drones (uncrewed aerial vehicles – UAVs) remain most prevalent, but maritime drones also have a significant impact in the Black Sea and land drones (uncrewed ground vehicles–UGVs) are emerging on the battlefield[3].

While the variety of drones is rapidly expanding, so is the scale of their use and attrition. Reliable figures are hard to find, but production data indicates that drone consumption by both Russia and Ukraine is massive. Ukraine claims to have built more than a million drones in the first half of 2024[4]. Russia in turn is reported to procure 100 000 low-tier drones monthly from domestic and foreign sources[5].

The impact of these drones varies significantly however depending on their type, making it necessary to define the term more closely. Drones can be armed or unarmed; used for ISR or effect; they can be recoverable or one-way-attack (OWA) drones that self-destruct on impact; or they can be remotely piloted with first-person view (FPV) goggles or programmed as loitering munitions to search for a predefined target. Moreover, many OWA drones are now treated as consumables, not unlike artillery shells, while others are more akin to cruise missiles[6]. Growing niche applications include everything from dropping mines to breathing fire to UAVs ramming one another out of the sky.

DARWINIAN DRONES

The use of drones in warfare is not new. Since the early 2000s, the United States has carried out thousands of long-range drone strikes on high-value targets around the world as part of its Global War on Terror. In contrast, the war in Ukraine features a vast number and variety of drones constantly hovering over the frontlines, making troop and vehicle movements difficult. It is also characterised by long-range drone strikes far behind the frontlines targeting airbases and naval shipyards, as well as civilian infrastructure like energy facilities and residential areas.

It is evident that the use of drones has changed the tactical level of warfare, but their strategic impact is less clear[7]. Decades of targeted drone strikes by the United States have not ended the threat from militants in the Middle East or Afghanistan and the massive use of drones in Ukraine by both sides has not shifted the frontlines in major ways.

The impact of drones, of course, also depends on the defences in place against them. Large aerial drones are easy prey for patrolling aircraft or surface-to-air missiles at higher altitudes, while radar-guided anti-aircraft artillery or even simple shotguns can target quadcopters at lower altitudes. Drones are also vulnerable to electronic warfare (EW) disrupting their communications and navigation, while physical protection like nets and metal cages can also limit the impact of drone attacks.

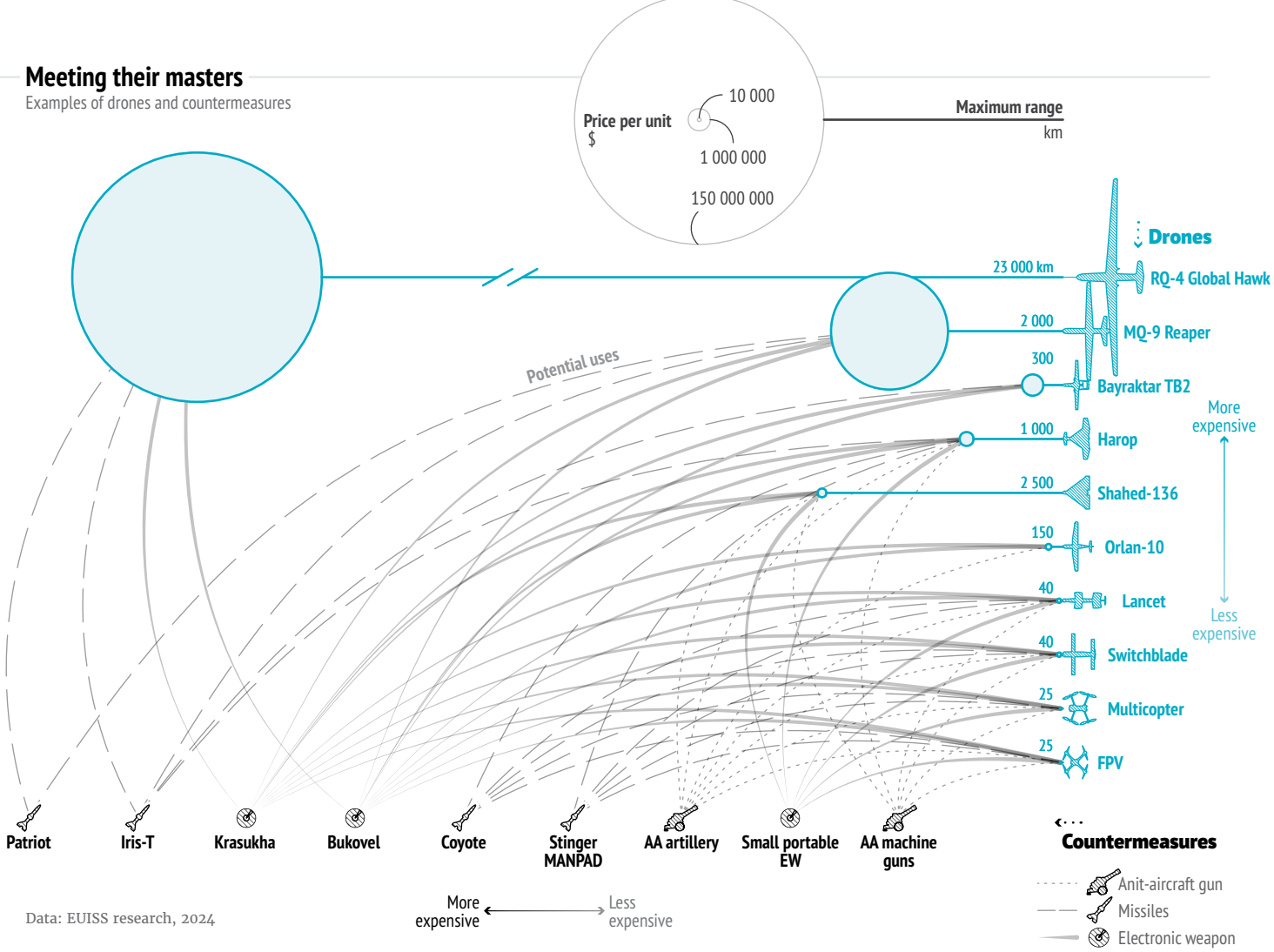
The near-perfect success rate of Israel, the United States, United Kingdom, France and Jordan in intercepting the more than 170 OWA drones (alongside 150 ballistic and cruise missiles) launched by Iran on Israel during a single night in April 2024 demonstrates what coordinated comprehensive modern air defences can do, even if at a high monetary cost[8].

Drones may not be a magic bullet that will single-handedly turn the tide of war, but they are here to stay. Their ability to provide surveillance and strike capabilities at relatively cheap cost has become essential. The establishment of a new armed forces branch in Ukraine, the 'Unmanned Systems Forces', reflects their importance. For Ukraine, however, the challenge is no longer the quantity of drones, but rather training pilots, acquiring enough high(er)-end systems, and staying ahead in the adaptation race between drones and countermeasures. Other countries in Europe and elsewhere are learning lessons identified in and by Ukraine, as is the EU.

THE EU AND DRONES

The EU is not starting from scratch, and Europe is well-positioned to play a key role in the future of drone warfare. Industry reports indicate that in 2022 more than 40 % of all drone companies in the world were headquartered in Europe. However, a significant portion of the global commercial drone market, estimated at 70-80 %, is controlled by one Chinese company, DJI[9]. The EU has also supported R&D of military uncrewed systems since 2015 through the European Defence Fund (EDF) and its precursor programmes. This includes some €100 million awarded in 2021 in support of the development of a long-endurance remotely piloted aircraft system – the Eurodrone. The EDF's 2023 work programme also included €68 million for counter-drone systems, while more than €200 million was earmarked for 2024 to cover drones of all sizes and domains[10].

As part of the European Defence Industrial Strategy (EDIS) released in March 2024, the EU further proposed 'to support the production of drones within the EU or possibly jointly with Ukraine'[11]. The whole spectrum of uncrewed systems across domains, including weaponisation of existing platforms, are featured prominently in the EU Capability Development



Priorities (CDP) approved by EU Defence Ministers in 2023. Notably, the CDP also calls for the development of a European, NATO-interoperable standard for air defence systems, including kinetic and directed energy systems capable of countering 'slow, small and low altitude threats and swarms of drones' [12].

As for counter-drone technologies, some of the most advanced manufacturers are also European. In particular, the cost-effectiveness of anti-aircraft guns in downing drones has revived the European specialty of anti-aircraft artillery. Rheinmetall is marketing the Skyranger anti-aircraft artillery system. Meanwhile BAE Systems just unveiled the Tridon Mk2, the latest version of the legendary 40mm Bofors anti-aircraft gun. Both systems are paired with advanced radar and programmable proximity fuse shells. In the sensor and electronic warfare segment, there are well-known European defence companies like Indra, Leonardo, Saab and Thales but also many cutting-edge small and medium-sized companies.

BRIDGING THE DRONE DIVIDE

However, European militaries lack the arsenals of armed drones and electronic countermeasures possessed by Russia and Ukraine. A few EU Member States hold small numbers of large, expensive, Medium Altitude Long Endurance (MALE) drones, similar to those used in the 'War on Terror', but their usefulness in a 'contested environment' is limited [13]. None have anywhere near enough disposable drones and loitering munitions to engage in high-intensity combat on the scale seen in Ukraine.

The drone gap between Ukraine and Russia on the one hand and everyone else is growing. This is not only a question of the number and quality of drones but also of the battle for dominance between drones and countermeasures. A technical advantage lasts only a few weeks before electronic warfare has adapted, requiring constant innovation and shifts in tactical use. Drone manufacturers thus rely on constant feedback from frontline operators to update components, software and tactics to ensure combat effectiveness [14].

Ukraine is already the leading drone manufacturer in Europe, together with Türkiye. But it needs sufficient funding to scale up production and better access to components like advanced radio transmitters and sensors [15]. To this end, Latvia and the United Kingdom co-lead an international 'Drone Capability Coalition' launched in 2024, which now includes 14 members to secure Ukraine's 'UAV supremacy'. By April 2024, the coalition had raised €550 million to arm Ukraine with drones and opened tenders in summer 2024 for industries from Ukraine Defence Contact Group members

to develop FPV drones[16]. Moreover, in October 2024 the Netherlands announced that it will invest €400 million for joint drone development with Ukraine, of which half will be spent in the Netherlands and the rest will be split between industry in Ukraine and in other countries[17].

For European drone companies, close cooperation with Ukraine is key. The rapid innovation cycles in drone warfare are driving European producers towards more agile and modular production. Ukraine's evaluation of drone performance should guide production decisions, allowing for the ramping up of selected systems and continuous adjustments, and facilitating intensive and ongoing competition. To assist in this process, the EU established a Defence Innovation Office (EUDIO) in Kyiv in September 2024. The office promotes European defence innovation activities in and with Ukraine, facilitates joint initiatives and connects EU start-ups and innovators with the Ukrainian defence industry and armed forces[18].

CONCLUSION

Drone warfare is here to stay. Even if they have not replaced artillery, drones will continue to evolve and proliferate. Once primarily a counter-insurgency tool, drones are now key weapon systems of war. The EU and its Member States need to quickly learn how to play the drone game both defensively and offensively.

Masses of low-tech disposable FPVs are already being built, while large, high-end drone systems remain challenging to operate in contested airspace. However, the middle ground of attritable systems presents an opportunity where Ukraine's expertise and experience and European defence needs and funding capacity overlap for mutual benefit. In this context, Europe is also well-positioned to become a leading provider of counter-drone systems.

Ukraine's ingenuity is the driving force of modern drone warfare. To benefit from that and to be ready for future conflicts, it is time for Europe to fully embrace the drone evolution. Access to Ukraine's accumulated expertise in fighting with and against drones however depends on its survival. The EU should therefore step up its support for Ukraine's drone warfare efforts and in the process build its own drone-specific defence production capacity. This can be achieved by fostering an innovative drone industry, including a stable supply chain for drone components, enhancing defence cooperation with Ukraine, and providing sufficient funding.

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