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**Research Report**

## Ukraine aid: How Europe can replace US support

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# KIEL POLICY BRIEF

Giuseppe Irto, Ivan Kharitonov, Taro Nishikawa, Christoph Trebesch

## **Ukraine Aid: How Europe Can Replace US Support**



No. 186 | March 2025

# Executive Summary

We study how Europe could replace US support for Ukraine both (i) financially, in terms of the fiscal effort required, and (ii) militarily, in terms of weapon production.

## Financial effort:

- The financial challenge of replacing US aid is limited. Currently, European governments are spending just 0.1% of their annual GDP on bilateral aid for Ukraine - a minor effort.
- To replace US aid flows and keep total support at the same level:
  - Europe needs to double its yearly support to an average level of 0.21% of GDP. This is less than half of what Denmark and the Baltics are already doing and on a level of what Poland and the Netherlands do. In short: Europe as a whole would need to follow Scandinavia's or Poland's example.
  - In absolute terms (billions of Euro), the biggest European countries and the EU Institutions will be decisive. To replace US aid and get to 0.21% of GDP, Europe as a whole needs to increase its yearly aid flow from currently €44 bn per year to €82 bn per year.
  - The biggest donors for that effort will be the EU institutions (Commission and EIB), who will need to increase their annual support from currently €16 bn to €36 bn per year. Next comes Germany (from currently €6 billion to at least €9 billion per year), then the United Kingdom (from €5 to €6.5 bn per year), then France (from currently just €1.5 bn to €6 bn per year), Italy (from currently just €0.8 bn to €4.5 bn) and Spain (from just €0.5 bn to €3 bn per year). All remaining European donors would need to move from €14 bn to €16.5 bn per year.
- To avoid free-riding, we recommend offering financial incentives to those countries giving aid to Ukraine. Big Ukrainian donors (in % of GDP) could get priority access to any new EU-level defense financing scheme. Large Ukraine aid could also be exempt from EU fiscal rules, or deducted from each nation's contributions to the EU budget.

**Military effort:**

- On military aid, replacing the US will be more challenging, but is possible in many domains. We show weapon-by-weapon that Europe's industry has viable alternatives for almost all of the main US heavy weapon systems donated to Ukraine. Europe also accelerated ammunition production and this effort would now need to be intensified at greater speed and scale, especially for howitzer ammunition.
- Our data show that the biggest dependency on US-produced weapons is in (i) rocket artillery such as HIMARS (86% of weapons for Ukraine are US-produced systems), (ii) Howitzer ammunition (82% US produced), (iii) long-range anti-aircraft systems such as Patriots (70% US produced). In other domains, European weapons play a more important role, in particular regarding howitzers and battle tanks.
- Among the heavy weapons, US HIMARS and Patriots are hardest to replace, as is the supply of ammunition for these systems. Also US intelligence sharing and satellite imagery are decisive.
- To respond to these challenges:
  - Europe needs to ramp up the production of essential weapons and artillery ammunition quickly and broadly. It is advantageous that European donors already transitioned away from donating from stocks to procuring new weapons for Ukraine from industry. These procurement efforts would need to be extended considerably by making firm medium- and long-term commitments to weapon-producing firms.
  - For US weapons that are hard to replace, Europe could place orders in the US and beyond. Viable alternatives to HIMARS include the South Korean K239 Chunmoo and Israel's PULS. In addition, Europe could heavily invest in the development and production of alternative systems such as SAMP/T.
  - European countries could also increase drone production considerably, both by European producers, and, more importantly, by directly investing in the highly successful weapons industry of Ukraine.
  - Finally, Europe would need to move quickly to build alternative digital, satellite, and intelligence systems, including accelerated and expanded initiatives such as the satellite internet constellation IRIS<sup>2</sup>.

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# Ukraine Aid: How Europe Can Replace US Support

Giuseppe Irto, Ivan Kharitonov, Taro Nishikawa, Christoph Trebesch

## 1 Introduction

The new US administration under President Donald Trump is seriously questioning its future commitment to Ukraine - a major change in the US policy stance. Since Russia's full-scale invasion in February of 2022, the US has been a major supporter of Ukraine, on par with all European countries combined. However, with the US now signaling to halt or scale back its assistance, European leaders are discussing how to fill the gap.

This report, aims to provide a fact-based analysis of how Europe can take on the task of replacing US support—both financially and militarily — in the short- and medium term. The analysis is heavily based on the detailed data collected for the Kiel Institute's Ukraine Support Tracker (Bomprezzi et al., 2025).

**Replacing US aid is an ambitious but achievable task for Europe.** Currently, European governments contribute about €44 billion annually to Ukraine's defense, or roughly 0.1% of their combined GDP, a relatively modest fiscal commitment. To replace total US aid, Europe would need to increase its annual support to approximately €82 billion per year, or 0.21% of GDP —essentially doubling its current financial effort. Although this is a significant increase, it is well within Europe's financial capacity. In fact, when using Scandinavian countries as a benchmark, the number appears low. Denmark, the Baltic countries, Sweden or Norway are already contributing more than 0.3% of their GDP each year to Ukraine's defense. Such an effort would not only strengthen Ukraine's position but also demonstrate Europe's collective commitment to its security and values.

The task of increasing financial support will fall primarily on the largest European economies and EU institutions. The EU, which currently contributes €16 billion annually, would need to raise its support to €36 billion per year. Next comes Germany, who would need to increase support from currently €6 billion to at least €9 billion per year, then the United Kingdom (from €5 to € 6.5 bn per year), then France (from currently just €1.5 bn to €6 bn per year), Italy (from currently just €0.8 bn to €4.5 bn) and Spain (from just €0.5 bn to €3 bn per year). All remaining European donors would need to move from €14 bn to €16.5 bn per year.

To ensure fairness and prevent free-riding by individual governments, Europe should consider

financial incentives for countries that contribute a larger share of their GDP to Ukraine's defense. These incentives could include preferential access to any new EU defense financing schemes or exemptions from EU fiscal rules. Such measures would encourage broader support across the continent.

***Replacing US military aid is a more complex undertaking.*** The US has been a crucial supplier of heavy weapons and ammunition, which have been vital to Ukraine's defense. However, Europe's defense industry already produces many of the weapons Ukraine relies on, such as howitzers, air defense systems, tanks, and infantry fighting vehicles. To replace US aid in these arenas, European countries need to ramp up production fast and broadly.

The US military aid that will be hardest to replace are rocket artillery systems (like HIMARS) and air defense systems (like Patriot), as well as ammunition for these systems on the battlefield in Ukraine. Europe currently has no viable alternative for these systems. It should therefore consider to purchase them from the US directly and/or turn to foreign alternatives such as the South Korean K239 Chunmoo or Israel's PULS systems. At the same time, it should invest heavily in future generation of European systems such as the SAMP/T.

It will be easier to ramp up the production of howitzer ammunition, particularly in the medium term. Currently, Ukraine remains heavily dependent on US supplied ammunition, and replacing it will require a significant increase in European capacity. The European defense industry has made advances in this area since 2023, but further acceleration is necessary.

Europe could also significantly boost drone production, both through European manufacturers and, crucially, by investing directly in Ukraine's highly successful weapons industry. Ukraine has developed and deployed a range of cheap and highly effective drone systems, and is producing them in the millions. By supporting Ukraine's domestic drone production, Europe can help reduce Ukraine's dependence on foreign aid and hope for learning-by-doing for its own drone industry.

Beyond weapons and ammunition, Europe must also address the critical issue of military intelligence. The US has been a crucial provider of satellite imagery and intelligence sharing, capabilities that are difficult to replicate in the short term. To compensate for this, Europe will need to move quickly to develop its own digital and intelligence systems, including expanding initiatives like the IRIS<sup>2</sup> satellite internet constellation. By focusing on these areas, Europe can support Ukraine's future defenses while simultaneously enhancing its own strategic capabilities.

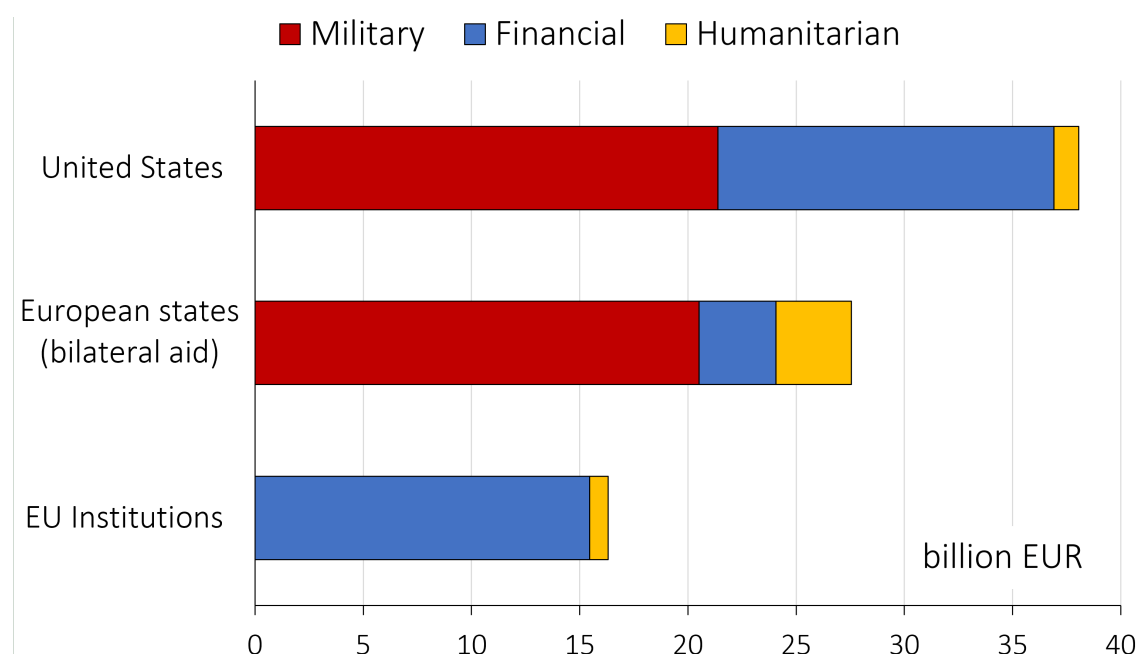
The remainder of the paper is structured as follows. In Section 2, we give an overview of aid flows over the past 3 years. In Section 3, we calculate how much more Europe would need to spend on Ukraine to replace US aid fully (under the assumption that aid flows in the years ahead continue at the level of the past 3 years). Section 4 discusses how Europe could replace the US in the military domain, both in aggregate and by weapon types. Section 5 concludes.

## 2 Support for Ukraine 2022-24: not a major fiscal effort

This section uses data from our Ukraine Support Tracker to provide an overview of the scale of support that the US and Europe provided to Ukraine in the last three years. By Europe we mean European countries (EU member states, the United Kingdom, Norway, Switzerland, and Iceland) as well as EU institutions (EU Commission, Council, and EIB). We take a budgetary perspective and calculate support both in absolute terms and as percentage of countries' 2023 GDP. We treat EU institutions as a separate donor to highlight the different aid patterns on a country versus EU level.

Figure 1 shows that the United States allocated an average of €38 billion per year over the past 3 years, while European states and EU institutions provided €27.5 and €16 billion per year, respectively. Europe as a whole thus clearly surpassed the support by the United States, allocating €43.5 billion vs €38 billion annually.

**Figure 1: Aid to Ukraine in billion Euros, yearly average 2022-24**



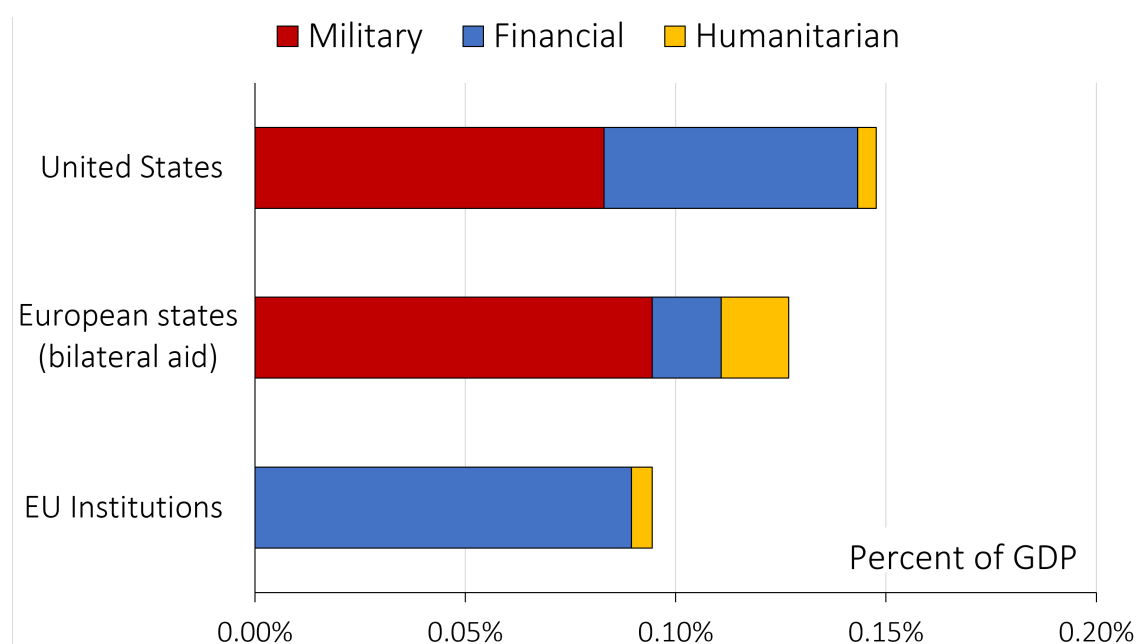
*Note:* This figure shows the yearly average allocations (average of 2022, 2023, and 2024 allocations), in absolute numbers (billion Euros) and by type of aid for the United States, European states bilaterally (geographical Europe), and the EU institutions (European Commission, Council, and EIB).

The average value of military aid allocation has been about equal, with around €20 billion per year. On financial aid, the EU institutions have played the main role in Europe, in particular by giving out highly concessional loans to Ukraine, through the European Macro-Financial Assistance program.



Together, the European Commission, Council, and EIB, allocated more than €15 billion per year in budgetary assistance to Ukraine. This is similar to the €15.5 billion financial aid per year provided by the US, although the US has mainly given grants that do not need to be paid back. Humanitarian aid plays a far lesser role, with European states having been the most active on humanitarian support, on average (European Commission, 2025).

**Figure 2: Allocated aid, yearly average (percent of GDP)**



*Note:* This figure shows the yearly average allocations (average of 2022, 2023, and 2024 allocations), as percentage of the correspondent donor's 2023 GDP and by type of aid for the United States, European states bilaterally (geographic Europe), and EU institutions (European Commission, Council, and EIB).

The scale of aid to Ukraine appears much smaller when considering the size of the respective donor economies. Figure 2 shows yearly average aid allocations in percent of donor GDP (using 2023 GDP for benchmarking). As can be seen, the United States allocated just 0.15% of their GDP per year to Ukraine, European states the 0.13%, and the EU institutions just below the 0.1%. We again count EU institutions as a separate donor, thus dividing total EU-level aid by total EU GDP of 2023.

In summary, while the total aid figures appear large in absolute terms, both Europe and the US have mobilised only a very small share of their annual GDP for Ukraine. Even secondary domestic subsidy programmes typically absorb more fiscal space than Ukraine aid, e.g. tax breaks for company cars. From a budgetary perspective, Ukraine aid over the last three years looks more like a political side project than a major fiscal effort (Bomprezzi et al., 2025).

### 3 The fiscal costs of replacing the US: How much more would Europe need to spend?

This section asks: how much more would Europe need to spend on Ukraine if it were to replace US aid allocations at the same level as in the last three years? To answer this question, we conduct a simple simulation by reallocating US aid flows to Europe, both in absolute terms and as a percentage of donor GDP.

#### 3.1 Getting to 0.21% of GDP per year - the European target to replace US aid

If we assume future aid to Ukraine to continue on the same (low) level as in the years 2022-2024, i.e. we calculate the yearly average total allocations by the US and Europe over these three years, we get to about €82 billion. To fully allocate that aid to Europe, we can then divide that yearly average amount of aid by the sum of European donor countries' GDP of 2023. The result is a target ratio of yearly aid amounting to 0.21% of European GDP.

Europe could fully compensate for the halt in US aid, if each of the European countries and the EU institutions (counted as a separate donor), would mobilize 0.21% of their GDP to Ukraine.

We treat EU institutions as a separate donor in this scenario, because the funding decision on the EU-level aid to Ukraine has so far been largely detached from the national budgetary processes of individual EU member states.<sup>1</sup> Moreover, large amounts of EU-level financial aid have been committed but not disbursed, so that it should be possible to reach the annual 0.21% to GDP target for the EU institutions by frontloading future promised payments to the present. Specifically, as of January 2025 the EU has committed an additional €66 billion in financial aid that has not yet been disbursed but could be accelerated, thus helping to double the past average aid flow of 0.1% of EU GDP per year (average 2022-24 for EU institutions) to more than 0.2% per year in 2025 and 2026.

Figure 3 shows how far each country's past aid allocations are from the target of 0.21% of GDP. The blue bars average bilateral aid flows by country as a 3-year average across 2022-24, while the red and green shaded parts show whether a country is above or below that 0.21% target when considering past aid flows. As it can be seen, over the past 3 years, there were stark differences in how supportive European countries have been to Ukraine.

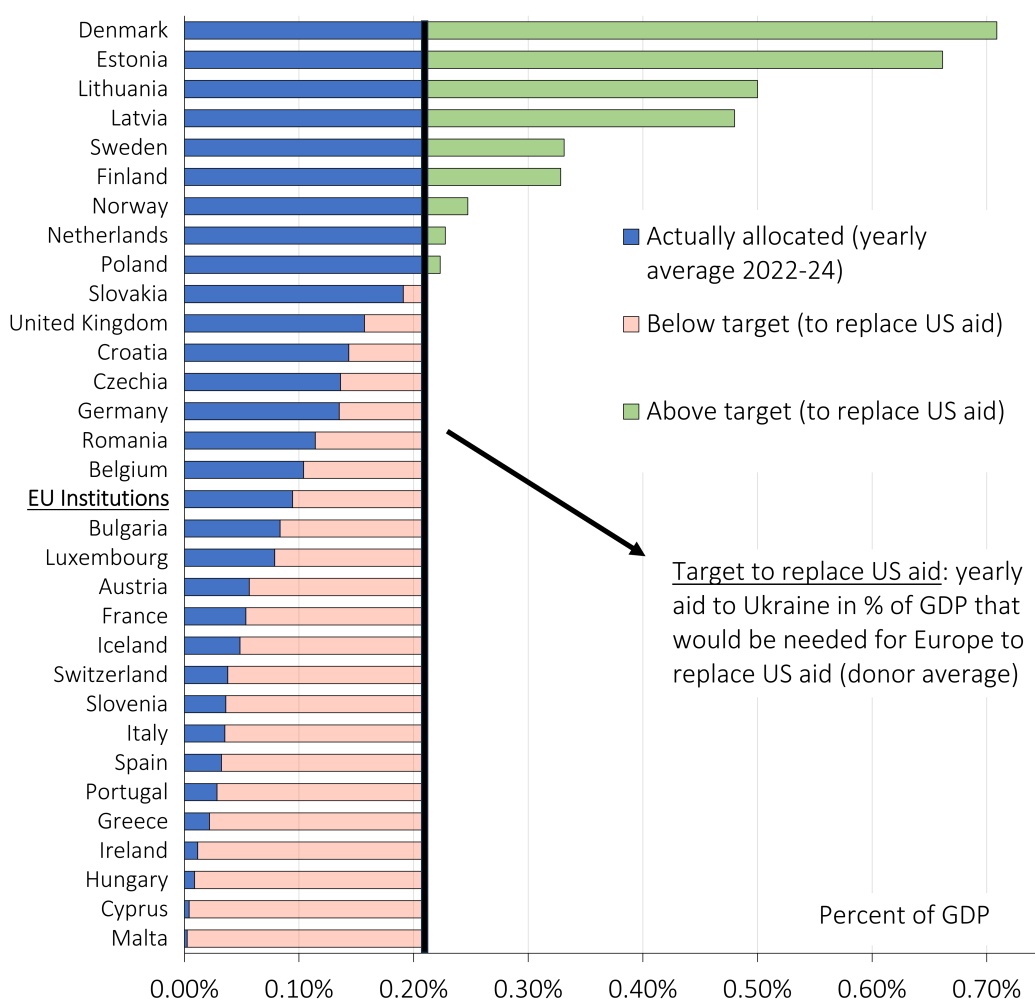
The Nordic countries, the Baltics, and Poland have already been allocating more than the 0.21% of GDP that would be required by all European donors to replace US aid. More precisely, the average yearly bilateral aid of Denmark and Estonia was close to 0.7% of their 2023 GDP, that of Lithuania

<sup>1</sup>If we reassign EU-level aid to individual EU countries, the target level of aid to replace US support increases to the equivalent of 0.38% of GDP per European country per year.

and Latvia 0.5%, Sweden and Finland 0.3%, and Norway, the Netherlands, and Poland are just above the 0.21% target.

In contrast, the big European donor countries have allocated far less in bilateral aid. The UK and Germany mobilized on average 0.16% and 0.13% in yearly aid as percent of GDP. This is far below what Scandinavian or Baltic countries have done, but also much higher than for other major European economies. France has mobilized average aid flows of only 0.05% of annual GDP, Italy just 0.04%, and Spain a mere 0.03%.

**Figure 3: Distance from target of 0.21% of GDP to replace US aid compared to past aid flows (by donor)**



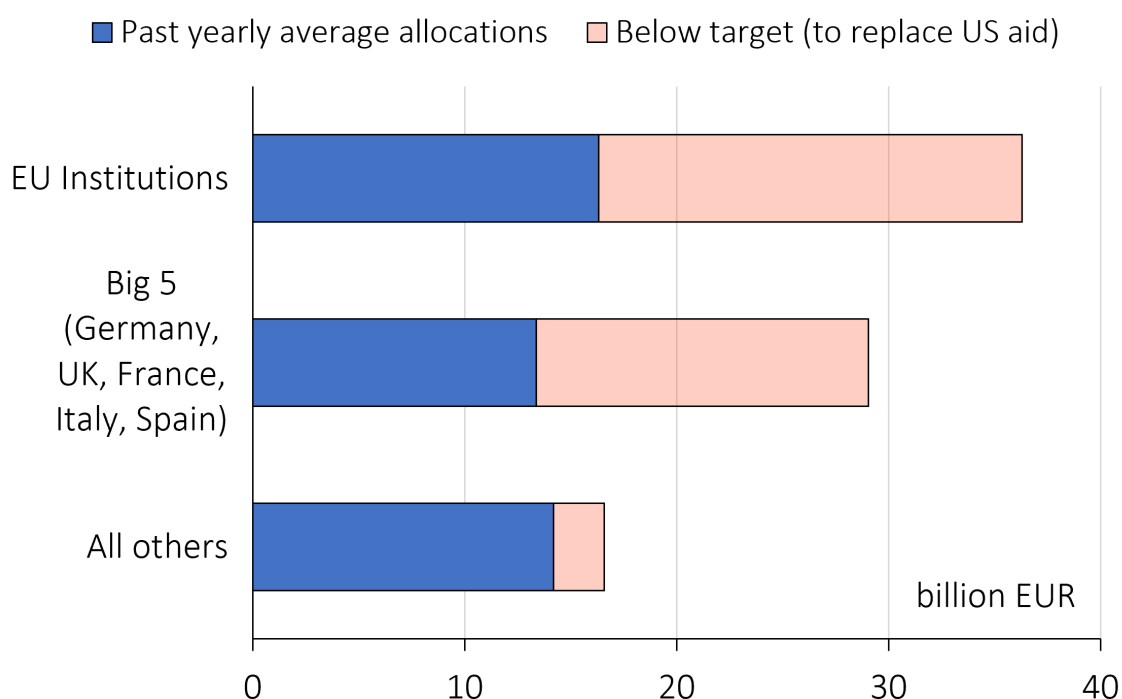
*Note:* This figure shows how far European donors are from the required target to replace US support, which we estimate at 0.21% of donor GDP per year across Europe. To calculate the past level of aid by donor (dark blue bars) we use 3-year average aid allocations by donor and divide it by their 2023 GDP. We count EU institutions as a separate donor, thus dividing total EU-level aid by total EU GDP of 2023. The green bars illustrate that donors have already spent more, on average, per year than the required 0.21% average.

### 3.2 Getting to 82 billion euros per year

We now transform the relative target numbers into absolute ones, thus moving from a target in percent of GDP to one expressed in billions of Euros.

Figure 3 groups European donors into three categories: (i) the EU institutions, (ii) the biggest European economies ("Big 5") and (iii) all others (all other EU member states plus Norway, Switzerland, and Iceland). We then compare the past average allocation of each group in billion Euros to the required target (again assuming the 0.21% of GDP). Each of the 3 groups allocated about €15 billion in yearly aid to Ukraine over the past 3 years.

**Figure 4: Distance from target to replace US aid (in billion Euros, by donor group)**

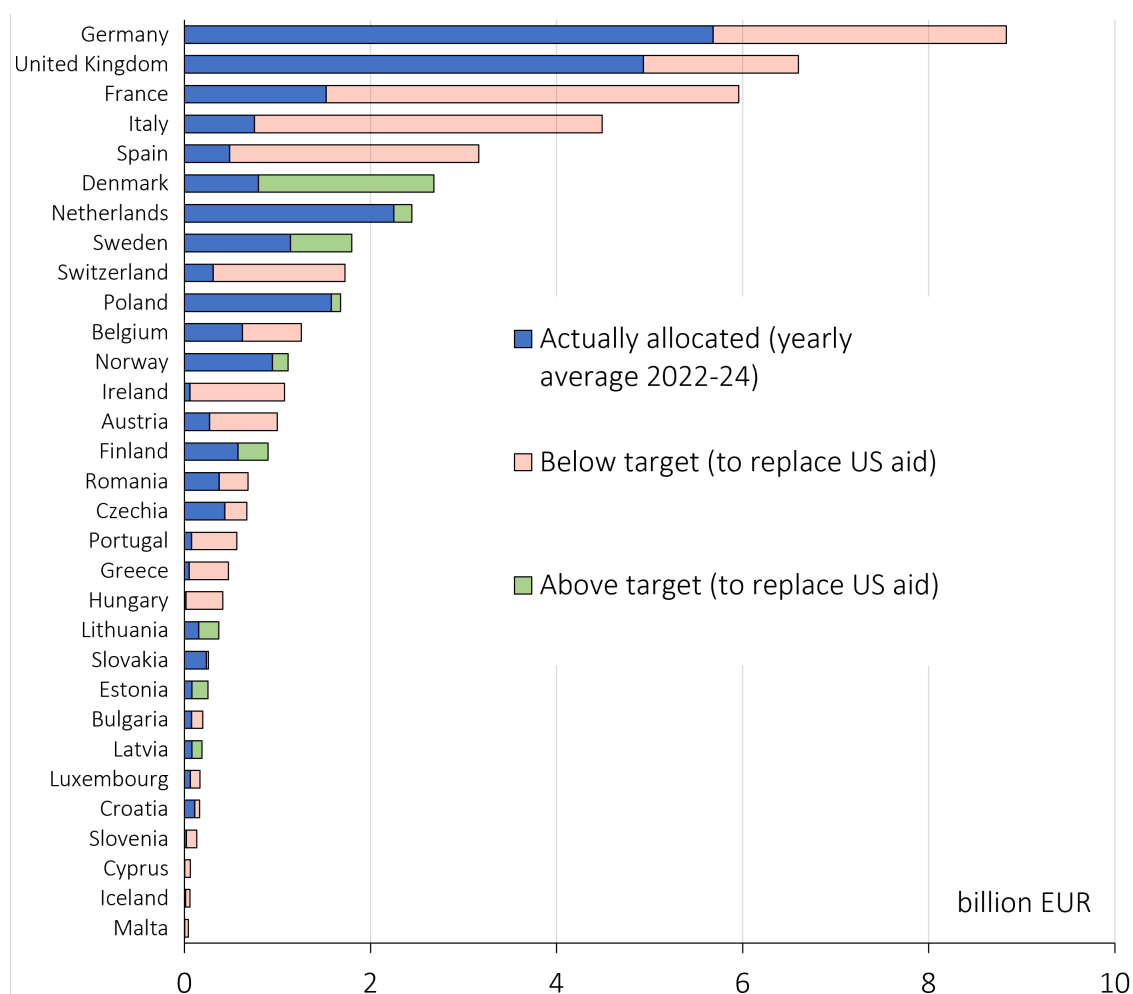


*Note:* This figure shows how far European donors are from the required target to replace US support, which we estimate at 0.21% of donor GDP per year across Europe. "EU institutions" comprises the EU Commission, Council, and EIB; The "Big 5" comprise the biggest European economies: Germany, the UK, France, Italy, and Spain; "All others" comprise all other EU member states plus Norway, Switzerland, and Iceland. Unlike in Figure 1 we now calculate target numbers in billion. The dark-blue bar show the past 3-year average aid allocation by donor, and the light-red bar is the distance from the target, again in absolute values.

It is striking how far the big 5 are from the required target in our simulation. As a group, Germany, France, Italy, Spain and the UK would need to more than double their bilateral aid to contribute their share in replacing US support (to almost €30 billion per year). Also the EU Institutions would need to double their effort, more than to €36 billion per year. In contrast, the remaining countries

would already almost meet the required target if they continued to allocate aid at the same level of the past 3 years.

**Figure 5: Distance from target to replace US aid (in billion Euros, by country)**



*Note:* This figure shows how far European bilateral donors (excluding EU institutions) are from the required target to replace US support, which we estimate at 0.21% of donor GDP per year across Europe. This time the 0.21% of the GDP is computed for each donor in order to see that target number in billion euros. The dark-blue bar is the past 3-year average aid allocations by donor, and the light-red bar is the distance from the 0.21% target. The green bars illustrate, again in absolute terms, that donors have already spent more, on average, per year than the required 0.21% average.

Figure 5 uses the same logic as Figure 4 but focuses on individual European countries. It is again striking how far the biggest countries are from the target, especially France, Italy and Spain. In contrast, smaller counties like Denmark, the Netherlands, Sweden or the Baltics are clearly above the target when comparing past aid to the required aid in our "replacing the US" scenario (illustrated by the green bars).

The main takeaway from both Figure 4 and 5 is that the biggest European countries and the EU institutions will be by far the most decisive players to replace US aid. Germany would need to increase its yearly aid allocation from €6 in the past to at least €9 billion euros per year, the UK would need to increase its aid from €5 to €6.5 billion, France from €1.5 to €6 billion (a whopping €4.5 billion more!), Italy from a mere €0.8 to €4.5 billion and Spain from €0.5 to €3 billion. In addition, the EU institutions would need to increase their aid by €20 billion per year (Figure 4).

Thus, in absolute terms, the challenge of replacing US aid falls largely upon the "big 5" countries and the EU institutions.

## 4 Replacing US military aid – European options

The previous section examined whether Europe could offset a potential stall in US aid by increasing funding. However, funding alone does not necessarily ensure effective support for Ukraine. This is particularly evident in the military domain, where donors' ability to assist Ukraine ultimately depends on their capacity to supply weapon systems that meet Ukraine's operational needs in both quality and quantity.

Against this backdrop, another core question arises: can Europe supply the necessary weapons to Ukraine if US support was no longer available? Addressing this issue requires a more detailed, weapon-level analysis.

The central challenge for such a weapon-level analysis is data transparency, especially on European military aid. While the US provides comprehensive figures in its regularly updated weapon support fact sheets on the US Department of Defense website, several European donors do not disclose detailed information on the quantities of weapons supplied to Ukraine, making direct comparisons difficult. To navigate these limitations, we focus on major weapon systems in which donors tend to be relatively more transparent and compare the supply of these heavy weapons by the US and Europe.

Our heavy weapon analysis focuses on three aspects. First, we use past weapon donations to assess Ukraine's dependence on US military aid by weapon type. Specifically, as a proxy for US dependency, we calculate what share of past aid by weapon types was produced in the US (irrespective of whether the system was donated by the US itself or by a European donor). Second, we go through the major US weapon systems and identify potential European substitutes. Third, we briefly address whether Europe could compensate for a halt of non-tangible US support, in particular intelligence capabilities.

#### 4.1 Which US weapons are particularly important? Evidence from aid 2022-24

To assess the dependency on the US by weapon type we focus on the country of manufacturing, i.e. on whether a weapon system was produced on the US or not. The rationale for doing so is a potential US veto on arms transfers to Ukraine. For US produced weapons the US government retains the authority to approve or deny the re-export of its weapons to third countries. This means that a complete halt in US support for Ukraine would not only cut off direct American arms deliveries but also prevent European nations from transferring US-made weaponry.<sup>2</sup> This kind of veto would have major consequences, because a significant portion of the weapons transferred by European countries were US produced.

To measure Ukraine's dependence from the US therefore requires accounting not only for weapons directly allocated by the US but also for weapons that were donated by European nations, but were originally manufactured in the US — or even those produced in collaboration with the US.

Figure 6 shows the share of US-manufactured versus European-manufactured armaments supplied to Ukraine using weapon donation data between 2022 to 2024. To avoid bias across weapon types, this analysis generally excludes systems that are neither produced in the US nor in Europe, such as Soviet-era weapons sourced from former Eastern Bloc countries. The analysis is based on weapon numbers (counting systems) rather than their value, but the patterns are generally similar when building this ranking with the value of donations (see Appendix Figure A1).

The main insight from Figure 6 is that the US dominance is largest for rocket artillery, particularly multiple launch rocket systems (MLRS) such as HIMARS, as 86% of total deliveries to Ukraine originate from US production. Another category that relies heavily on US weapons is long-range air defense systems, such as US Patriot systems, with a share of 70% of US origin.

We find that 70% of Infantry Fighting Vehicles (IFV) donated to Ukraine since 2022 were US-produced (note that a significant proportion of European donations were Soviet-era systems, which are excluded from this comparison). Here, however, it does make a difference whether we account for the value of vehicles, as the share of the value of IFVs donated to Ukraine of US origin decreases to just 34% (see Appendix Figure A1). A similar picture emerges when looking at short and medium-range surface-to-air missile systems, such as IRIS-T. US dependency is 59% in terms of numbers, but drops to 28% in terms of value.

Additionally, the US has long dominated the supply of howitzer ammunition to Ukraine. Based on our data, we calculate that 82% of the total reported supply of this ammunition was US produced. However, it is important to note that European transparency regarding ammunition allocations is

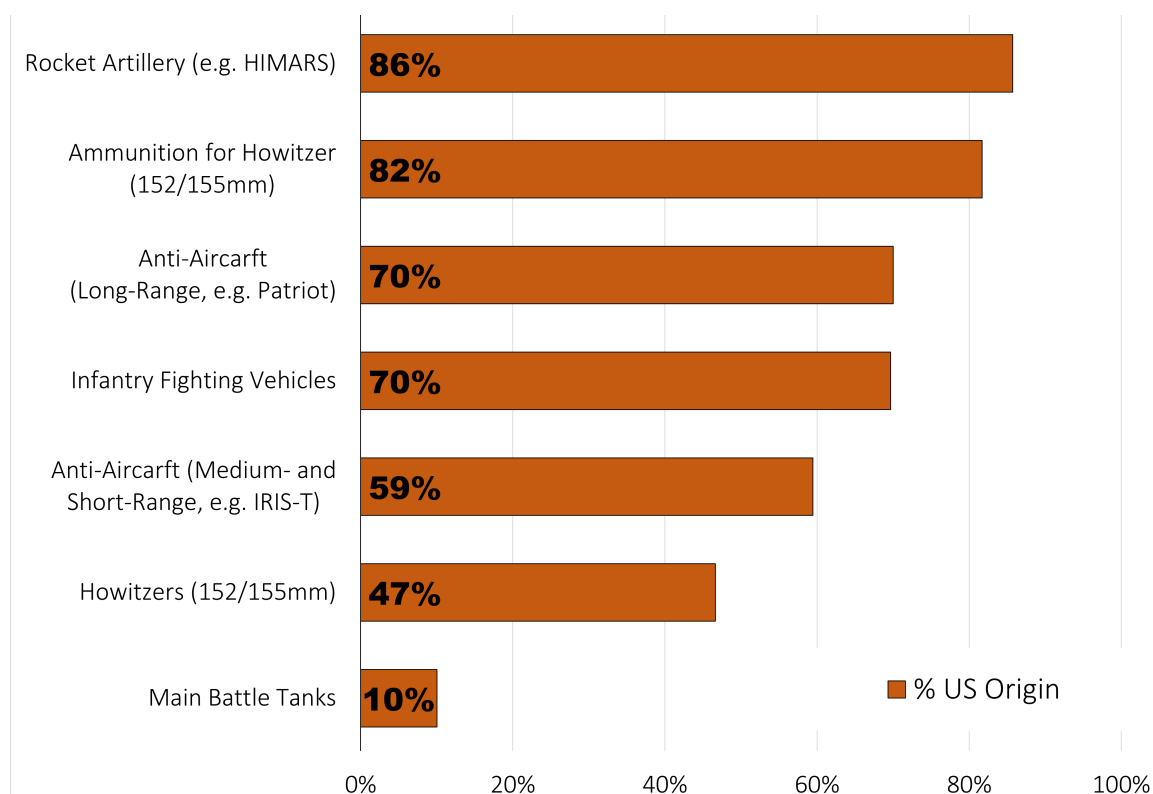
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<sup>2</sup>See <https://cepa.org/article/us-bureaucracy-is-blocking-arms-for-ukraine/> for more details.

lower than that of the United States. As a result of this underreporting, the true number of European produced shells is likely higher.

The pattern is more balanced for other weapon categories. For howitzers and tanks, dependency on US weapons stands at 47% and 10%, respectively.

**Figure 6: US dominance by weapon type: % of US-manufactured weapons (2022-2024, item-based)**



*Note:* This figure illustrates the "dependency rate" of US-manufactured weapon systems in military aid to Ukraine. The dependency rate represents the share of US-manufactured weapons within the combined total number of weapons provided by the US and European donors, with the total set at 100% for each weapon category. The calculation is structured as follows: First, all weapons provided directly by the US are counted as US-manufactured. Second, weapons manufactured by US companies or developed jointly with US companies (e.g., NASAMS) and provided by European donors are also included in the US dependency share. Weapons produced exclusively by European defense industries, however, are not counted toward US dependency. To clearly compare European and US contributions based on weapon origins, weapon systems originating from outside these two regions—such as Soviet-origin weapons supplied by Eastern European countries—are excluded from this calculation. A complementary analysis based on the monetary value of weapons, rather than item count, is provided in the appendix (Figure A1).

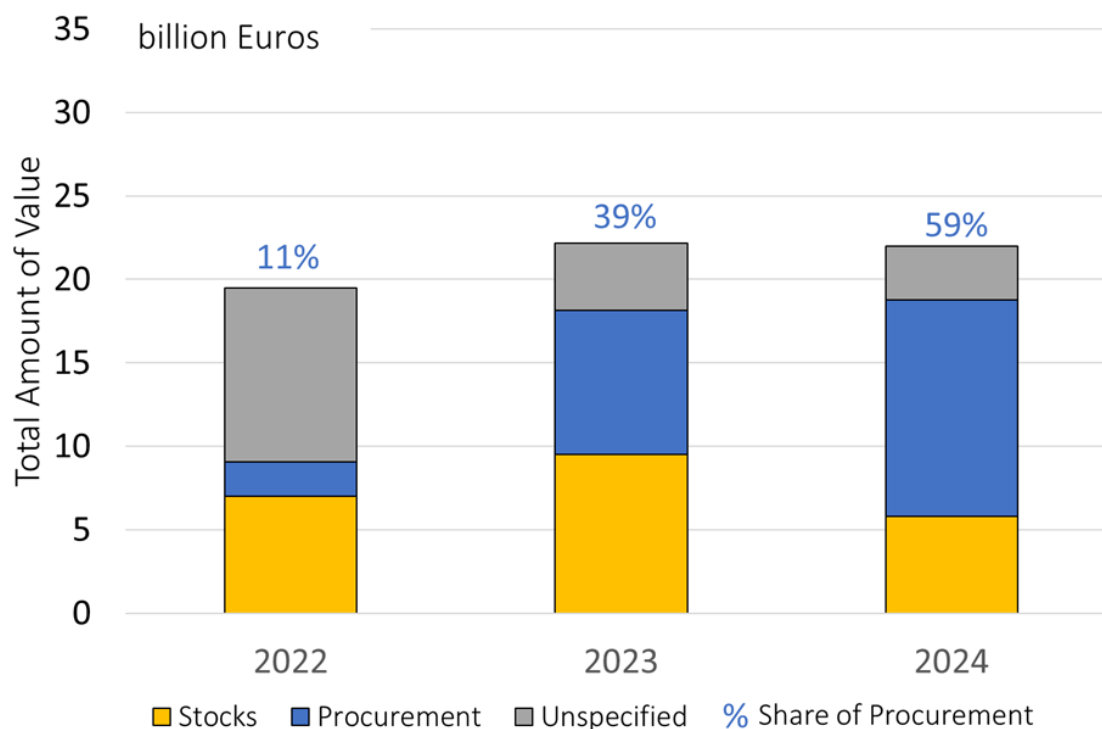


## 4.2 Europe has shifted from donating weapon stocks to procuring from industry

To reduce reliance on U.S.-manufactured weapons, Europe must expand production capacity of its defense industry. This process has already started, albeit slowly and on a small scale. When the war broke out, most European donors sent weapons from their national stockpiles. However, recently, European donors have started ordering increasing number of weapons directly from manufacturers.

Figure 7 illustrates this trend. Europe is now providing a growing share of the military aid from industry. In 2022, procurement made up just 11% of European military aid to Ukraine. This rose to 39% in 2023 and 59% in 2024.

**Figure 7: Procurement Share of European Military Aid (2022-2024)**



*Note:* This figure shows the total value of military aid provided to Ukraine by European donors (EU, UK, Norway, Iceland, and Switzerland) between 2022 and 2024, distinguishing between aid sourced through procurement from the defense industry and aid supplied from existing stockpiles of donor or third-country armed forces. In some cases, it is unclear whether the aid came from stockpiles or was newly procured due to a lack of available information. These amounts are labeled as "unspecified" and represented by a gray bar. The procurement share, which is shown on top of each bar, is calculated by dividing the total value of weapons acquired through procurement by the total value of military aid allocated each year.

### 4.3 Which US arms could be replaced by European alternatives?

In this section, we assess which European alternatives exist for US weapons. We conduct a detailed evaluation of individual weapon types, comparing US-supplied models with their European counterparts to identify gaps and constraints in availability.

We begin with rocket artillery for which the dependency on the US is largest. As shown in Table 1, there are only few European rocket artillery systems being produced in the first place, which explains why Europe's donation share for this weapon type is so low. At present, the European military-industrial complex provides no alternatives to US systems like HIMARS and M270. Nonetheless, three European countries—the Czech Republic, Slovakia, and Romania—either produce or are preparing to produce MLRS that partially can fill the gap.

The Czech Republic and Slovakia each manufacture a modernized variant of the Soviet BM-21 Grad, called the RM-70, independently of each other and relying almost exclusively on EU suppliers. The Romanian LAROM system, on the other hand, is built in cooperation with Israel, meaning Israeli approval is required before any such weapons can be transferred to Ukraine. As a result, the best Europe can currently offer, without external authorization, is a modernized Soviet-era rocket artillery.

In addition to these weapon systems, Rheinmetall, a German defense company, announced a joint program in 2023 to develop a new Global Mobile Artillery Rocket System (GMARS), in collaboration with Lockheed Martin. While it could serve as a potential alternative to US-manufactured rocket artillery, it is not included in our list since its development involves a US company, meaning it cannot be considered a fully European system.<sup>3</sup>

To diversify its defense capabilities in this weapon category, Europe could also increase its arms imports, e.g., with the K239 Chunmoo from South Korea or with Israel's PULS (EuroPULS). Europe could thus aim for a temporary solution to sustain Ukrainian defense with rocket artillery by relying on these imports and ramping up the production capacities of these weapons in Eastern European countries.

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<sup>3</sup>See <https://www.rheinmetall.com/de/produkte/taktische-radfahrzeuge/gepanzerte-radfahrzeuge/gmars> for more details.

**Table 1: Rocket Artillery and Ammunition**

Model	Country	Company	Donated to Ukraine
<b>Rocket Artillery</b>			
<b>US weapons (donated by US or others)</b>			
M270			yes (28 units)
HIMARS-142			yes (42 units)
<b>European alternatives</b>			
RM-70 variants	Czechia/Slovakia	Excalibur Army/STV Group	yes
LAROM MLRS	Romania	Aerostar	no
<b>Rocket Artillery Ammunition</b>			
<b>US weapons (donated by US or others)</b>			
Missiles for HIMARS and M270			unknown
<b>European alternatives</b>			
GRAD/RM-70 Missiles	Czechia/Slovakia/Bulgaria	Excalibur Army/Arcon Partners	unknown
GRAD/RM-70 Missiles	Slovakia	STV Group/Delta Defence	yes
GRAD/RM-70 Missiles	Bulgaria	Arcon Partners/Atlas International Group	unknown

*Note:* This table compares US-origin Multiple Launch Rocket Systems (MLRS, e.g. HIMARS) and their ammunition donated to Ukraine with the European alternatives (EU, UK, Norway, Iceland, and Switzerland) either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. The table does not distinguish between the age and the quality of the systems.

The next "weak point" of the European aid to Ukraine is long-range air defense systems, i.e., systems like Patriots. The only available alternative that Europe can offer is the French-Italian SAMP/T (Table 2). However, even in this case, only one SAMP/T has been donated to Ukraine so far, as the total number of produced units is around only 10 (Kabachynskyi, 2025). Another problem is the lack of ammunition for such systems. Given the limited number of systems produced, the production capacity of these missiles is also constrained. Moreover, the unit cost of such missiles can be quite high, considering that Patriot missiles, which are produced in much larger quantities, cost around 13 million per missile (Burilkov, Mejino-López, and Wolff, 2024). Unless production of the SAMP/T is quickly and decisively expanded, Europe will not be able to fill this gap.

**Table 2: Long-range Air-Defense Systems**

Model	Country	Company	Donated to Ukraine
<b>Anti-Aircraft (long-range) and its ammunition</b>			
<b>US weapons (donated by US or others)</b>			
Patriot			yes (7 units)
<b>European alternatives</b>			
SAMP/T	France/Italy	Eurosam	yes
ASTER Missile	France/Italy	Eurosam	yes

*Note:* This table compares US-origin long-range air-defense systems (SAM systems, e.g. Patriot) donated to Ukraine with the European alternatives (EU, UK, Norway, Iceland, and Switzerland) either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. The table does not distinguish between the age and the quality of the systems.

The situation appears more favorable for short- and medium-range air defense systems, as Europe has been able to supply newly procured weapons from its own defense industry. Germany has provided IRIS-T systems, while Spain and Italy have delivered at least one Aspide battery. Other European-produced systems, such as the French VL MICA, are in development but have yet to be supplied to Ukraine.

However, challenges remain. Despite high procurement levels in this category, Eastern European donors still rely heavily on Soviet-era stockpiles. Additionally, deliveries have been slow, with only 6 IRIS-T systems delivered so far. These factors could create bottlenecks if Europe seeks to scale up its weapon allocations to Ukraine.

Recent developments, however, may help address these limitations. In March 2025, Diehl, the German manufacturer of the IRIS-T system, signed a memorandum of understanding with Ukraine's Ministry of Defense to launch a joint industrial project and triple the supply of air defense systems and missiles. Such cooperation could improve procurement efficiency and significantly boost European donors' capacity to supply Ukraine with weapons and ammunition from their own industry (Ministry of Defence of Ukraine, 2025).

**Table 3: Medium-and Short- Range Air-Defense Systems**

Model	Country	Company	Donated to Ukraine
<b>Anti-Aircraft (Medium- and Short-Range)</b>			
<b>US weapons (donated by US or others)</b>			
<b>HAWK</b>			yes (9 units)
<b>NASAMS</b>			yes (14 units)
<b>European alternatives</b>			
<b>Iris-T</b>	Germany	Diehl Defence	yes
<b>Spada/Aspide</b>	Italy	MBDA Italy	yes
<b>VL MICA</b>	France	MBDA France	no
<b>Anti-Aircraft Missiles</b>			
<b>US weapons (donated by US or others)</b>			
<b>AMRAAM for NASAMS</b>			unknown
<b>MIM-23 for HAWK</b>			unknown
<b>European alternatives</b>			
<b>MICA</b>	France	MBDA France	no
<b>IRIS-T Missile</b>	Germany	Diehl Defence	yes

*Note:* This table compares US-origin short- and medium-range air-defense systems (SAM systems) and their ammunition donated to Ukraine with the European (EU, UK, Norway, Iceland, and Switzerland) alternatives either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. The table does not distinguish between the age and the quality of the systems.

Similarly positive conclusions can be drawn when it comes to artillery systems. Table 4 illustrates that the European defense industry has significant production capacity for artillery, particularly NATO-standard 155 mm howitzers. Several European countries have well-established artillery manufacturers. For instance, Germany's KMW and Rheinmetall, along with France's Nexter, are leading arms and artillery producers in Europe, consistently ranking or having ranked in the top 100 global arms manufacturers (SIPRI, 2023). In addition, multiple European countries continue to produce and supply howitzers, including Poland's Krab, Sweden's Archer, Slovakia's Zuzana-2, the UK's AS-90, and the Czech Republic's DITA.

These production capabilities, combined with the moderate procurement share depicted in

Figure A4, suggest a reliable long-term outlook for European artillery. Since these systems remain in active production, it is likely feasible to scale up output more decisively in the short and medium term.

The situation looks bleaker when it comes to artillery ammunition. While Europe has a significant number of ammunition manufacturers, production capacity has been slow to accelerate. Both Europe and the US have struggled to supply Ukraine with ammunition at a level comparable to Russia. To respond to this shortcoming, Europe has started to procure ammunition from external sources. In 2024, a well-known Czech-led initiative was launched to secure additional large-caliber artillery ammunition, with the Czech president recently confirming that the initiative will continue. In sum, European howitzer production could possibly fill the gap left by the US, but it will take more time to scale up the ammunition production capacity. European donors should thus heavily focus on ramping up ammunition production.

**Table 4: Howitzer and Ammunition**

Model	Country	Company	Donated to Ukraine
<b>Howitzers (152/155mm)</b>			
<b>US weapons (donated by US or others)</b>			
M777			yes (193 units)
M109			yes (141 units)
<b>European alternatives</b>			
Zusana-2	Slovakia	KONŠTRUKTA-Defence JSC	yes
CAESAR	France	Nexter	yes
RCH-155	Germany	Krauss-Maffei Wegmann	yes
Panzerhaubitze 2000	Germany	Rheinmetall/Krauss-Maffei Wegmann (KMW)	yes
DITA	Czech Republic	Excalibur Army	yes
TRF1	France	S2M-Equipment	yes
AS-90	United Kingdom	BAE Systems Land	yes
AHS Krab	Poland	Huta Stalowa Wola	yes
Archer	Sweden	BAE Systems Bofors	yes
<b>Howitzer Ammunition (152/155mm)</b>			
<b>US weapons (donated by US or others)</b>			
155mm Howitzer Shells			yes (3.5 million shells)
<b>European alternatives</b>			
155mm Howitzer Shells	Germany	Rheinmetall	yes
155mm Howitzer Shells	Norway	Nammo	yes
155mm Howitzer Shells	Sweden	BAE Systems Bofors/Nexter Systems	yes
155mm Howitzer Shells	France	Nexter/Thales	yes
155mm Howitzer Shells	Spain	Rheinmetall Expal Munitions	yes
155mm Howitzer Shells	Finland	Patria	yes
155mm Howitzer Shells	Poland	Mesko	yes
155mm Howitzer Shells	Slovakia	ZVS Holding	yes
155mm Howitzer Shells	Czech Republic	STV Group	yes
155mm Howitzer Shells	Italy	Leonardo	yes
152/155mm Shells	Serbia	Yugoimport SDPR	yes
152mm Howitzer Shells	Bulgaria	Arsenal AD	yes

*Note:* This table compares US-origin 152mm and 155mm howitzers and their ammunition donated to Ukraine with the European (EU, UK, Norway, Iceland, and Switzerland) alternatives either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. The table does not distinguish between the age and the quality of the systems.

The situation with main battle tanks is a mixed picture. On the one hand, Europe has demonstrated significant capacity to supply tanks to Ukraine, even compared to US contributions (Figure 6).

This finding is further supported by Table 5, which shows that many European countries have well-established manufacturers in this category, with several models already delivered to Ukraine, including older variants. For example, Germany and the United Kingdom have supplied Ukraine with older Leopard and Challenger tanks, whereas France has not provided its Leclerc tanks.

However, concerns remain regarding whether Europe's production capacity is sufficient to sustain Ukraine's ongoing needs. As shown in Appendix Figure A4, 79% of all main battle tank donations to Ukraine have come from existing stockpiles rather than newly manufactured units. Among these stockpiled donations, Soviet-era models account for 70% of the total, meaning that approximately 55% of all European tank donations consist of refurbished Soviet tanks. This underscores the continued reliance of European donors, particularly those in Eastern Europe, on upgrading and refurbishing older Soviet-era tanks, such as the T-72, rather than shifting toward large-scale procurement of newly produced vehicles. This stock-dependent nature raises concerns about Europe's long-term ability to sustain tank provision, especially with rising demand amid reduced US support.

When it comes to infantry fighting vehicles, European countries are also sending mostly older models. However, unlike tanks and howitzers, many of these vehicles are not in continuous production. Among the systems donated to Ukraine, only the Swedish CV90 is still in production. Nevertheless, other countries have the capacity to produce IFVs. For example, German Pumas and Lynxes, French VBCI, or Polish Borsuk. There are also cases of European countries procuring refurbished Soviet IFVs, but there is no clear evidence of who has done this and how sustainable it may be.

In the current conflict, drones and loitering munition play an increasingly dominant role. Even without focusing specifically on reliance on US-made drones, it is important to assess whether European industry has the capacity to assist Ukraine with drones. Figure 6 provides an incomplete list of the European defense industry's drone production capabilities. In the case of drones, Europe also has significant capabilities to supply Ukraine. However, it is important to note that in this particular case, Ukraine should also be considered as a potential investment ground for increasing drone production, as it has its own large and innovative drone production sector, such as Saker UAV Scout Drone by Ukrainian Defense Sector, Mini Shark by Ukrspecsystems, AQ-400 Scythe by Terminal Autonomy, etc.



**Table 5: Main Battle Tanks and IFVs**

Model	Country	Company	Donated to Ukraine
<b>Main Battle Tanks</b>			
<b>US weapons (donated by US or others)</b>			
Abrams M1A1			yes (31 units)
<b>European alternatives</b>			
Leopard	Germany	Rheinmetall/Krauss-Maffei Wegmann (KMW)	yes, older
Leclerc	France	Nexter	no
Challenger	U.K./Germany	Rheinmetall BAE Systems Land	yes, older
<i>Refurbishment or Upgrade of Soviet Tanks</i>			
PT-91 Twardy	Poland	Bumar-Łabędy	yes
T-72EA	Czech Republic	Excalibur Army	yes
T-72M	Slovakia	ZTS Dubnica	yes
<i>Examples of Refurbishment or Upgrade of Western Tanks</i>			
Leopard-1A5	Germany	Flensburger Fahrzeugbau	yes
<b>Infantry Fighting Vehicles</b>			
<b>US weapons (donated by US or others)</b>			
Bradley			yes (305 units)
YPR-765 (European countries only)			yes (269 units)
<b>European alternatives</b>			
Puma	Germany	Rheinmetall/Krauss-Maffei Wegmann (KMW)	unknown
Lynx KF41	Germany	Rheinmetall	no
CV90	Sweden	BAE Systems Hägglunds	yes
VBCI	France	Nexter	no
Boxer	Germany	Rheinmetall/Krauss-Maffei Wegmann (KMW)	no
Borsuk	Poland	Huta Stalowa Wola	no
<i>Refurbishment or Upgrade of Soviet Vehicles</i>			
BMP variants	unknown	unknown	yes

*Note:* This table compares US-origin Main Battle Tanks (MBT) and Infantry Fighting Vehicles (IFV) donated to Ukraine with the European (EU, UK, Norway, Iceland, and Switzerland) alternatives either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. The table does not distinguish between the age and the quality of the systems.

**Table 6: Drones (incomplete list)**

Model	Country	Company	Donated to Ukraine
<b>Drones</b>			
<b>US drones (incomplete list)</b>			
Altius-600			yes (unknown)
CyberLux K8			yes (unknown)
Jump 20			yes (unknown)
Desert Hawk			yes (200 units)
Phoenix Ghost			yes (1801 units)
Puma			yes (unknown)
RQ-11B Raven			yes (unknown)
Scan Eagle			yes (15 units)
Switchblade 600			yes (900 units)
<b>European alternatives (incomplete list)</b>			
Black Hornet	Norway	Prox Dynamics	yes
Delair	France	Delair SAS	yes
FlyEye	Poland	Flytronic	yes
Golden Eagle	Israel	Steadicopter	yes
Hornet XR	Lithuania	Granta Autonomy UAB	yes
LUNA NG	Germany	EMT Penzberg	yes
Primoco UAV One 150	Czech Republic	Primoco UAV SE	yes
RQ-35 HEIDRUN	Denmark	Sky-Watch	yes
SONGBIRD	Germany	Germandrones	yes
VECTOR	Germany	Quantum-Systems	yes
Skywatch	Denmark	Sky-Watch (AIRO Group Holdings)	yes
UX11 COLIBRI	France	Delair SAS	yes
VT-4 Rothen	Germany	OptoPrecision	yes
Eurodrone	International	Airbus/Dassault Aviation/Leonardo	no
nEUROn UCAV	France	Dassault Aviation and EU consortium	no
Taranis	United Kingdom	BAE Systems	no
Watchkeeper WK450	United Kingdom	Thales/Elbit Systems	no
Patroller	France	Safran Electronics	no
Falco Xplorer	Italy	Leonardo	no
CH-92A (Pegaz)	Serbia	Yugoimport SDPR	no

*Note:* This table compares US-origin drones donated to Ukraine with the European (EU, UK, Norway, Iceland, and Switzerland) alternatives either donated to Ukraine (yes in the "donated to Ukraine" column) or those that could potentially be donated. The tables also show the country of manufacture, the manufacturing company, and the parent company. Please note that the list of potential drones to be provided is not final. The table also does not distinguish between the type of drones.

#### 4.4 Military aid beyond weapons

While this report has primarily focused on Europe's potential to replace the United States as a provider of weaponry to Ukraine, it is important to recognize that military support extends beyond armaments. The U.S. provides Ukraine with critical capabilities—commonly referred to as “strategic enablers” —including reconnaissance, surveillance, satellite intelligence, and secure communication

systems. These assets play a crucial role in enhancing Ukraine's battlefield effectiveness by enabling real-time targeting, operational planning, and situational awareness.

Beyond government assistance, US industries have played a significant role with respect to strategic enablers. A prime example is SpaceX's Starlink satellite internet constellation, which has provided resilient, high-speed communication infrastructure since the onset of the war. This satellite-based system has proven exceptionally effective in ensuring uninterrupted connectivity for Ukrainian forces, enabling coordination at both tactical and strategic levels (U.S. Department of Defense, 2022).

Recent political developments indicate that the U.S. is potentially willing to suspend or halt not only weapon deliveries but also these strategic enablers. This possibility was highlighted in early March 2025, when senior officials from the Trump administration announced a complete halt to intelligence sharing — a decision that was more recently reversed (U.S. Department of State, 2025a; U.S. Department of State, 2025b). Such uncertainty could significantly impact Ukraine's operational capabilities, not only by disrupting government-provided support but also by jeopardizing access to privately operated systems like Starlink. The U.S. has facilitated Ukraine's use of Starlink by providing communication equipment, such as antennas, and covering some operational costs. Any reduction in this support could weaken Ukraine's battlefield connectivity, affecting both real-time military coordination and long-term strategic planning (U.S. Department of Defense, 2024).

Given this development, major European powers have expressed their willingness to step in and provide strategic support. For instance, the French Minister of the Armed Forces Sébastien Lecornu suggested that France could offer intelligence assistance using its own capabilities (Demorand and Salamé, 2025).

However, even if these efforts materialize, Europe is unlikely to match the scale and sophistication of U.S. capabilities in this domain. European militaries remain heavily dependent on the U.S. for strategic enablers. In its Strategic Compass, published in 2022, the European Union acknowledged significant shortfalls in key capabilities, including intelligence, surveillance, reconnaissance (ISR), secure communication infrastructure, and committed to increasing investments in these areas (Council of the European Union, 2022). However, progress remains limited. A motion recently submitted to the European Parliament reiterated that the EU continues to rely heavily on "non-European allies" for these capabilities, a reference that likely points to the United States (European Parliament, 2025).

This dependency could potentially be alleviated by ongoing initiatives such as IRIS<sup>2</sup>, the EU's project to develop a satellite constellation system aimed at providing both governmental and commercial connectivity services by 2030 (European Commission, 2024). However, the development of such strategic enablers requires substantial time and investment, limiting Europe's ability to offer these critical capabilities in the short term. In the meantime, the absence of these assets would

have an immediate and direct impact on Ukrainian forces, reducing battlefield awareness, targeting precision, and overall operational effectiveness. This highlights not only the challenges Europe faces in replacing U.S. weapon supplies but also the difficulty of ensuring continuous access to essential, intangible capabilities if the U.S. withdraws its support.

## 5 Conclusion

The cessation of US support for Ukraine is a significant challenge, but it also offers an opportunity for Europe to demonstrate its leadership and solidarity with Ukraine. Replacing US financial and military aid is a formidable task, but it is one that is within Europe's capabilities. The continent would need to increase its fiscal contributions to 0.21% of GDP, thus ideally following the example set by Denmark, the Nordic and Baltic states, which already provide 0.4% of GDP per year or more.

In terms of weapon production, Europe will find it difficult to fill some of the gaps left by the United States — particularly regarding rocket artillery (e.g., HIMARS) and long-range anti-aircraft systems (e.g., Patriots). European alternatives — such as the Franco-Italian SAMP/T — do exist, but increasing production capacity will take years. A temporary solution would involve purchasing these systems from abroad, as some European nations are already doing for their rocket artillery by acquiring South Korea's K239 Chunmoo and Israel's PULS (EuroPULS). In parallel, rapid development of alternative intelligence and satellite connectivity capabilities is crucial to preserve Ukraine's strategic edge should U.S. support wane.

In sum, the necessary tasks before Europe are clear: a concerted effort to increase financial support to Ukraine and a commitment to scaling up defense production across multiple domains. By following these recommendations, European nations could not only replace but potentially even exceed the financial and military shortfall from a freeze in US aid in several areas.

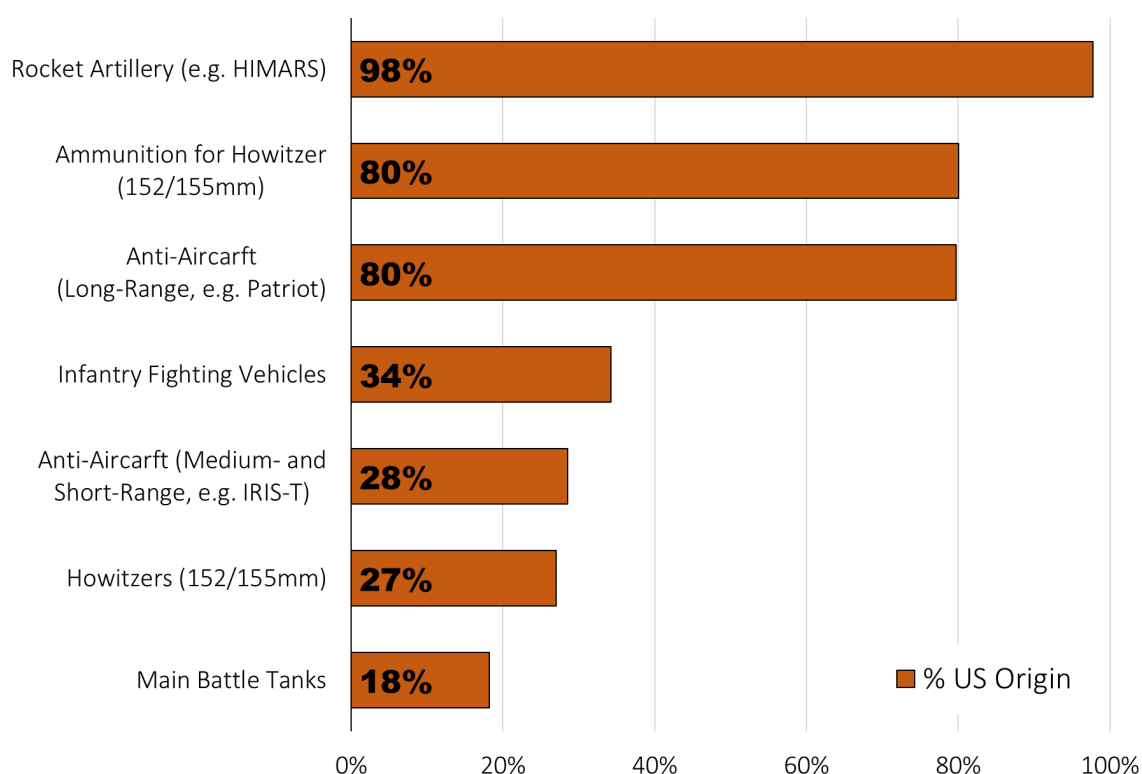
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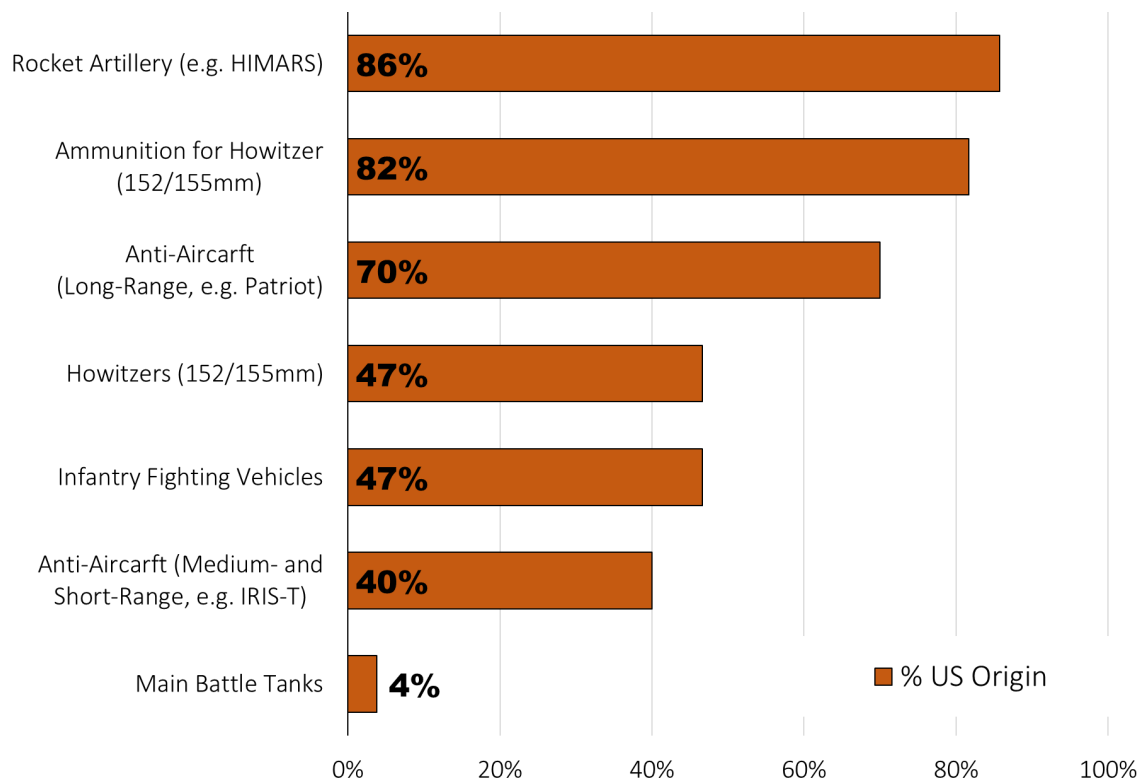
## A Appendix

**Figure A1: US dominance by weapon type: % of US-manufactured weapons (2022-2024, value-based, Soviet weapon excluded)**



*Note:* This figure illustrates the "dependency rate" of European donors on US-manufactured weapon systems in their military aid to Ukraine. The dependency rate represents the share of the value of US-manufactured weapons within the combined total value of weapon provided by the US and European donors, with the total set at 100% for each weapon category. The calculation is structured as follows: First, total value of weapons provided directly by the US are counted as US-manufactured. Second, weapons manufactured by US companies or developed jointly with US companies (e.g., NASAMS) and provided by European donors are also included in the US dependency share. Weapons produced exclusively by European defense industries, however, are not counted toward US dependency. To clearly compare European and US contributions based on weapon origins, weapon systems originating from outside these two regions—such as Soviet-origin weapons supplied by Eastern European countries—are excluded from this calculation.

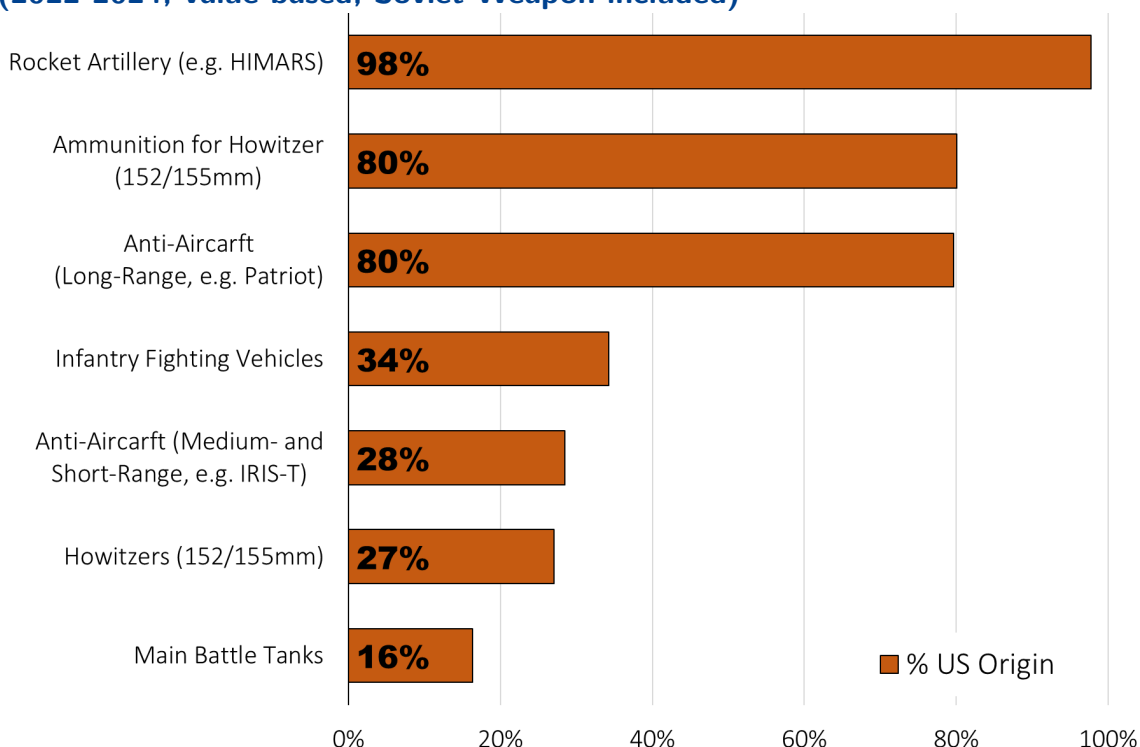
**Figure A2: US dominance by weapon type: % of US-manufactured weapons (2022-2024, number-based, Soviet Weapon included)**



*Note:* This figure illustrates the "dependency rate" of European donors on US-manufactured weapon systems in their military aid to Ukraine. The dependency rate represents the share of US-manufactured weapons within the combined total number of weapons provided by the US and European donors, with the total set at 100% for each weapon category. The calculation is structured as follows: First, all weapons provided directly by the US are counted as US-manufactured. Second, weapons manufactured by US companies or developed jointly with US companies (e.g., NASAMS) and provided by European donors are also included in the US dependency share. Weapons produced exclusively by European defense industries, however, are not counted toward US dependency. To provide a more detailed picture, weapon systems originating from outside these two regions—such as Soviet-origin weapons supplied by Eastern European countries—are included in this calculation.

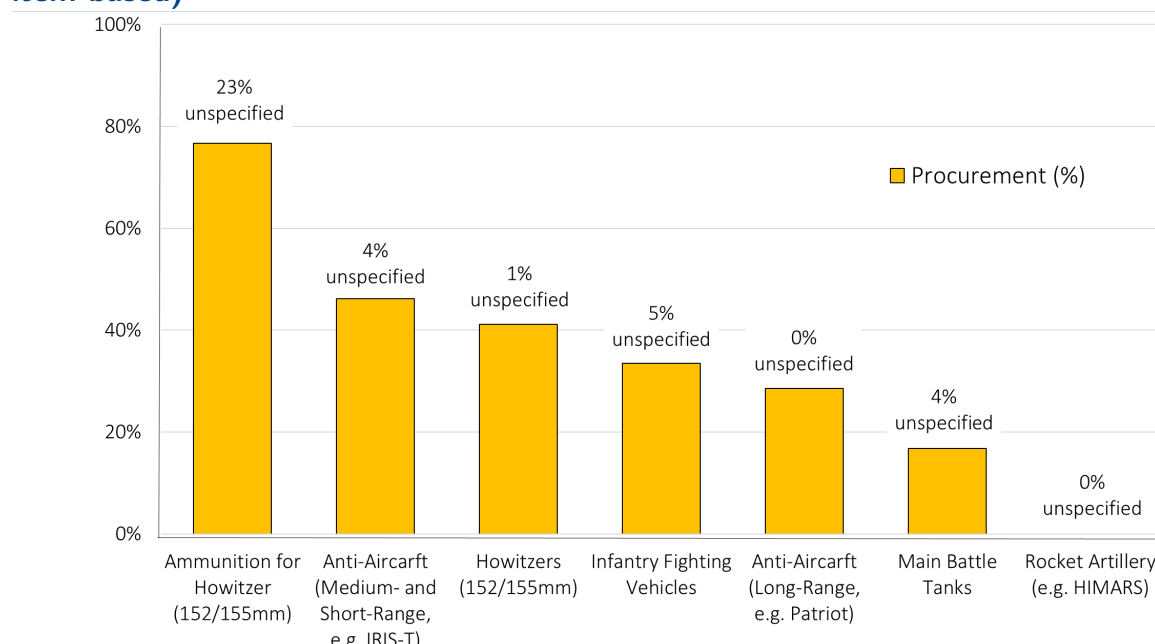


**Figure A3: US dominance by weapon type: % of US-manufactured weapons (2022-2024, value-based, Soviet Weapon included)**



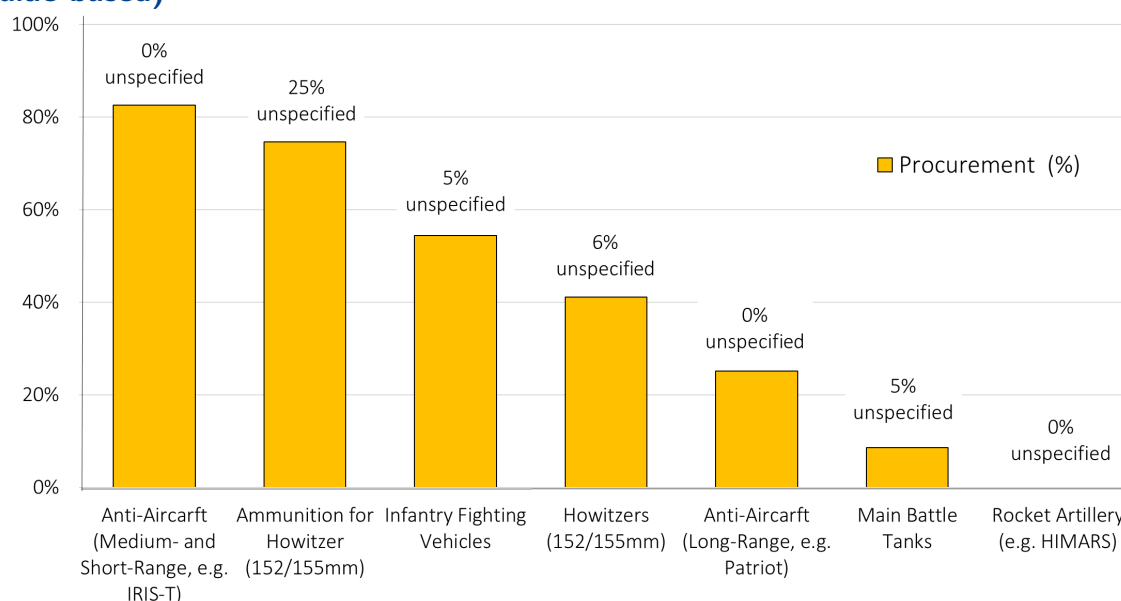
*Note:* This figure illustrates the "dependency rate" of European donors on US-manufactured weapon systems in their military aid to Ukraine. The dependency rate represents the share of the value of US-manufactured weapons within the combined total value of weapon provided by the US and European donors, with the total set at 100% for each weapon category. The calculation is structured as follows: First, total value of weapons provided directly by the US are counted as US-manufactured. Second, weapons manufactured by US companies or developed jointly with US companies (e.g., NASAMS) and provided by European donors are also included in the US dependency share. Weapons produced exclusively by European defense industries, however, are not counted toward US dependency. To provide a more detailed picture, weapon systems originating from outside these two regions—such as Soviet-origin weapons supplied by Eastern European countries—are included in this calculation.

**Figure A4: Procurement Share of Europe for Major Weapon Systems (2022-2024, item-based)**



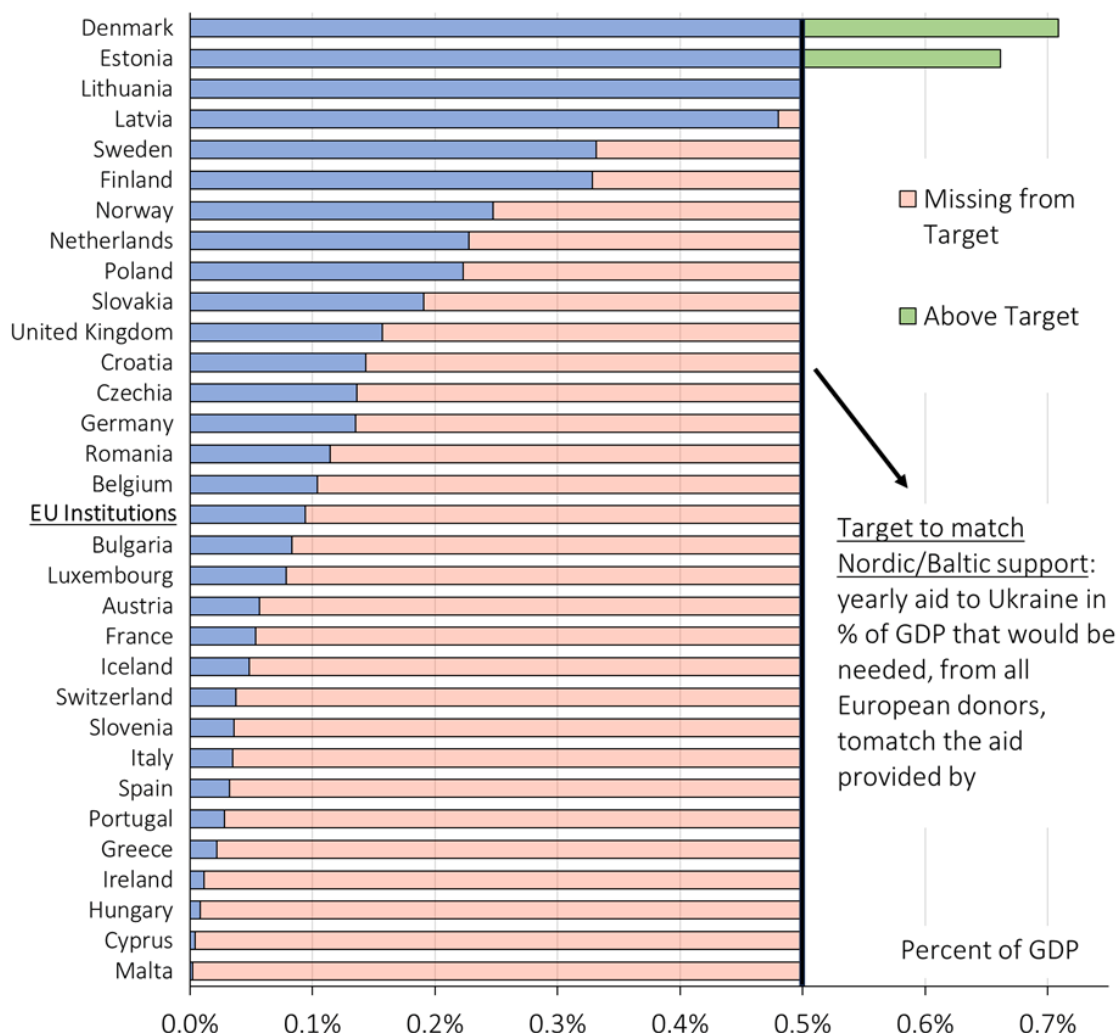
*Note:* This figure illustrates the procurement share among the total number of weapons allocated to Ukraine by European donors (EU, UK, Norway, Iceland, and Switzerland) between 2022 and 2024, categorized by weapon type. The procurement share is calculated based on the number of weapons, dividing the total quantity of weapons acquired through procurement from the defense industry by the total number of weapons allocated in each category. The remaining proportion, which is not included in the procurement share, represents either weapons provided from donors' existing stockpiles or weapons for which available information does not specify whether they came from stockpiles or procurement. For transparency, the percentage of "unspecified" weapons is indicated on the right side of each graph. A complementary analysis based on the monetary value of weapons, rather than item count, is provided in the appendix (Figure A5).

**Figure A5: Procurement Share of Europe for Major Weapon Systems (2022-2024, value-based)**



*Note:* This figure illustrates the procurement share among the total number of weapons allocated to Ukraine by European donors (EU, UK, Norway, Iceland, and Switzerland) between 2022 and 2024, categorized by weapon type. The procurement share is calculated based on the total value of weapons, dividing the total value acquired through procurement from the defense industry by the total value allocated in each category. The remaining proportion, which is not included in the procurement share, represents either weapons provided from donors' existing stockpiles or weapons for which available information does not specify whether they came from stockpiles or procurement. For transparency, the percentage of "unspecified" weapons is indicated on the right side of each graph.

**Figure A6: Following the Nordic and Baltic example - Targeting 0.5% of GDP per year in support)**



*Note:* This figure shows how far European donors are from matching the German support for Kuwait during the 1990/1991 Gulf war, which we estimate was the 0.5% of Germany's GDP per year. To calculate the past level of aid by donor (dark blue bars) we use 3-year average aid allocations by donor and divide it by their 2023 GDP. We count EU institutions as a separate donor, thus dividing total EU-level aid by total EU GDP of 2023. The green bars illustrate that donors have already spent more, on average, per year than the required 0.5%.

# IMPRESSUM

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