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Research Report

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SWP Comment

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Russian Missiles and the European Sky Shield Initiative

German plans to strengthen air and missile defence in the current threat environment

Lydia Wachs

Against the background of the Russian missile strikes against Ukraine, Germany has launched the European Sky Shield Initiative (ESSI) to strengthen Europe's air and missile defence. In the short term, it seems there is little likelihood of a Russian missile attack against NATO as Moscow probably lacks both the military means and the incentives. But, in the medium to long term, improving air and missile defence in Europe could curb Russia's coercive power vis-à-vis NATO and thereby strengthen the cohesion of the alliance. However, for this to happen and for the full potential of the initiative to be realized, several strategic, technical-operational and political issues should be addressed. Otherwise, ESSI could end up contributing to NATO fragmentation at the political and technical level.

In its war of aggression against Ukraine, Russia has deployed a large number of unmanned aerial systems (UASs) as well as cruise and ballistic missiles. This has exacerbated threat perceptions in Germany and other European states regarding Moscow's diverse long-range precision-strike capabilities, which, in turn, has often obscured the strategic and geopolitical context in which Russia's current arsenal is embedded. Understanding this context is important, however, as it has significant implications for the *nature* of the threat Russia poses to NATO — and thus to European air and missile defence.

Russia's precision-strike capabilities and strategy

For several decades now, Russia has been working on expanding its stockpile of conventional or what are mostly dual-capable precision-strike weapons. The term is used here to refer to those capabilities that can achieve effects at the operational or strategic level of warfare — in particular, ballistic and cruise missiles with short, medium and intermediate ranges (excluding intercontinental ballistic missiles). For a long time, Russia's ambition to expand its arsenal was driven primarily by its concerns about NATO's advanced precision-strike and air-power potential. Russian military officials



feared that in the early stages of a conflict, the Western alliance could launch a conventional surgical air-strike campaign against Russia's military potential. In such a scenario, Russia's conventional weaknesses would force Moscow to resort to nuclear weapons. But owing to the high escalation risk that would entail, Russian military elites questioned the credibility of such a strategy and thus Russian deterrence vis-à-vis NATO. While this dilemma had been discussed in the Soviet Union as early as in the 1980s, it was not until Russia's economic recovery after the turn of the millennium that Moscow was able to develop a diverse arsenal of dual-capable long-range strike capabilities as part of its larger military modernization programme. As a result, Russia now possesses air-, sea- and ground-launched cruise and ballistic missiles with various ranges and is able to threaten targets throughout Europe without having to immediately resort to nuclear weapons.

While little is known about Russia's targeting strategy vis-à-vis NATO, debates among Russian military elites, such as those in the official journal of the General Staff, suggest that Moscow envisages a potential conflict with the Alliance in three phases. In the first (counterforce) phase, Russia would likely concentrate on NATO's key military targets – air bases, command centres and key ports – in order to constrain NATO militarily and, in particular, reduce its ability to carry out sustained strikes against Russia. In the second (countervalue) phase, Moscow would focus on targets of military-economic significance or other critical infrastructure targets. Should Russia fail to end the conflict in its favour using non-nuclear capabilities, the third phase could entail the transition from the use of conventional capabilities to that of nuclear weapons.

Quantitative and qualitative challenges

Although Russia has expanded its non-nuclear precision-strike capabilities and

increased the role they play in its official deterrence strategy, it is unlikely that the escalation dilemma outlined above can be fully resolved, not least as Moscow may still face a quantitative problem. Even before the war against Ukraine, the depth of Russia's arsenal of non-nuclear precision weapons appeared insufficient to militarily weaken NATO in a conflict to such an extent that the conflict could quickly be ended in Moscow's favour. In order to focus solely on military targets throughout Europe and inflict sufficient damage to end a conflict on its own terms, Russia would require huge military capabilities. For this reason, it is likely that its focus would quickly switch to countervalue targets in a bid to undermine the political will in NATO capitals. But even in this scenario – and even before the Ukraine war – Russian strategists seem to have been very sceptical about Moscow's ability to sustain a conventional conflict against NATO. Thus, it is likely that Russia would either be forced to give up its aggression or turn to nuclear escalation, which, however, could be self-detering and curtail its political objectives.

Russia's war against Ukraine exacerbates this quantitative problem. Moscow's precision-strike capabilities have played a huge role in its war effort, not least because it has been unable to dominate the skies over Ukraine. Although there are no precise data either on Russia's pre-war arsenal or on its missile usage and reconstitution rate, its strikes against Ukraine have likely had a negative effect on its stockpiles.

At the same time, the war in Ukraine has revealed a qualitative problem. Russia has faced challenges with its targeting cycle – in particular, going after mobile targets. As a result, its strikes against Ukrainian air bases, for example, have had only limited results owing to the timely dispersal of Ukrainian aircraft to smaller bases. This suggests that Russia's capacity to significantly weaken NATO's military potential – not least its airpower potential – in a conflict would be reduced not only by quantitative issues but also by qualitative ones.

Given these challenges, it is most likely that Russia's priority will be to reconstitute its arsenal of cruise and ballistic missiles. That effort will probably be hindered by Western sanctions against the Russian economy, which are restricting the country's access to electronic components. Nevertheless, there are several indicators suggesting that Russia will be able to replenish its arsenal in the medium term – as long as it does not significantly step up its missile strikes. First, Moscow has often prioritized its defence investments in the past, despite economic problems. Second, it can circumvent the sanctions-related barriers to its access to technology in various ways, including through imports from China, illicit networks or fraudulent end-user licences. Third, Russia's military reconstitution seems to be in full swing already: in fact, as far as Iskander-M missiles are concerned, the current rate of expenditure seems to be lower than that of production. And there is also evidence that Russia has increased the production of Kh-101 cruise missiles since the start of the war. Thus, the impact of sanctions should not be overestimated.

The nature of the threat faced by NATO

The state of Russia's long-range precision-strike capabilities has various implications for NATO. It is important to distinguish here between the short term and the medium to long term. In the short term, there seems to be a fairly low threat of a Russian attack against the Alliance. It is true that the average number of missile strikes against Ukraine in the first year of the war suggests Russia is not facing any immediate shortages. But while this probably means that Russia's military capabilities, including its missile stockpiles, are sufficient to allow Moscow to continue its war against Ukraine, it is also the case that Russia will need what capabilities remain at its disposal to achieve its politico-military objectives in Ukraine. Moreover, Russia's behav-

our since the start of the war clearly indicates that it is shying away from a direct confrontation with NATO.

In the medium to long term, Russia will likely be able to reconstitute its arsenal. But even then, it may well still face the quantitative challenges outlined above. Although it is extremely difficult to predict how the war will develop and what changes will take place within the Russian regime, such challenges could be one of the reasons why Russia will continue to shy away from a direct conflict with the Alliance beyond the short term.

Most important, however, Moscow could – depending on the geopolitical situation – use its capabilities, once reconstituted, to exert political pressure. In a worsening crisis situation, Russia might exploit the deficiencies in Europe's ground-based air and missile defence to threaten selective conventional strikes against one or more NATO countries in a bid to intimidate Western populations and politically destabilize the Alliance. Thus, the threat posed by Russia's precision weapons is not so much their potential use against NATO as the possible exploitation of their coercive value to undermine NATO cohesion and sow further societal and political instability.

Air defence – a new priority

After the end of the Cold War, ground-based air defence played a subordinate role on the agenda of European capitals. That changed not only when Russia annexed Crimea in 2014 but also when it violated the Intermediate-Range Nuclear Forces Treaty. These developments forced NATO members to adjust their military postures, including by strengthening integrated air and missile defence. Nevertheless, many European states still possess equipment – some of which has Soviet origins – that is inadequate in both qualitative and quantitative terms to defend against Russia's diverse missile capabilities. This means that it is very likely that most high-value targets

in NATO Europe are unprotected against those capabilities.

Russia's invasion of Ukraine and its missile strikes against that country have significantly heightened the threat perception in Europe. Against this background, the German government launched the European Sky Shield Initiative (ESSI) in the autumn of 2022 to strengthen Europe's air and missile defence. What role can this initiative play in the context of the current threat environment?

The strategic value of air and missile defence

Judging from Russia's capabilities and Europe's geography and strategic depth, it seems that two points are incontrovertible. First, there cannot be a full-proof shield against Russian precision-strike capabilities. Indeed, as scholars contend, the strategic value of air and missile defence in peacetime or during times of heightened tension is the strengthening of deterrence. This is because such assets create uncertainty for the attacker about the outcome of an attack. They also raise the threshold for a conventional attack because the opponent would have to attack on a larger scale. And they shift the burden of risk to the adversary as a larger-scale attack means a greater risk of escalation. In the event of a military conflict, air and missile defence helps preserve freedom of action, since key military and political assets — such as air and naval bases or government institutions — can be safeguarded. As a result of such action mechanisms, air and missile defence can reduce the opponent's coercive leverage and contribute to NATO cohesion and political stability.

Second, there is no "one size fits all" solution against Russia's diverse long-range capabilities. What is required is an integrated air and missile defence architecture — one that links the various interoperable sensors, command and control assets, and weapon systems across all dimensions and, ideally, harmonizes them in such a way as

to create mutually overlapping layers and domains.

ESSI – a procurement initiative

ESSI follows this multi-layered approach, focusing primarily on ground-based air defence. The goal of the initiative is to procure more air and missile defence systems as quickly as possible and incorporate them into NATO's integrated air and missile defence (IAMD). To achieve economic scale effects and create military synergies, Germany has invited its European partners to jointly procure various off-the-shelf air defence systems. To date, 18 countries have signed up to Berlin's initiative and several others have expressed interest.

The German government has identified systems for four interception layers that it wants to procure with financing from the Bundeswehr special fund. For the very short range, the Bundeswehr will acquire the Close Air Defence System (LVS NNbS), which consists of a turret that is mounted on an armoured fighting vehicle and equipped with a radar, a cannon and missiles. The purpose of the system is to shield land operations from attacks by helicopters and UASs, among other things. The Ozelot system, previously used to perform such tasks, is no longer sufficient either in quantitative or qualitative terms.

For the short to medium range, the Bundeswehr will procure the IRIS-T SLM (Infra-Red Imaging System-Tail/Surface Launched Medium Range) system, which can be used to defend not only against UASs, helicopters and aircraft but also against cruise missiles.

For the long range, the US Patriot (Phased Array Tracking Radar for Intercept on Target) system is already being used by some European armed forces, including the Bundeswehr. Germany wants to procure new ammunition and replenish existing stocks. With its different guided missiles, Patriot can intercept a range of threats — from large UASs to cruise and short-range ballistic missiles.

These three systems for the short, medium and long range are being offered to partners to procure within the framework of ESSI. But in addition to procuring these systems within ESSI, Berlin has identified a further capability gap with regard to the very long range. For this reason, it plans to develop – initially at the national level – a capability to defend against long-range precision weapons; later it will examine whether and how this capability can be offered to partners and the Alliance. To acquire this capability, Germany intends to procure the Arrow system, which was developed by Israel and the United States and has so far been deployed only in Israel. The mobile ground-based missile defence system is designed to use, inter alia, the Arrow 3 interceptor to intercept medium- and intermediate-range ballistic missiles outside the atmosphere.

Strengthening or weakening alliance cohesion?

Given European's scarce air defence capabilities, it makes sense to seek to procure more systems and allow partners – especially smaller states – to join and benefit from the economic scale effects. While strengthening European air defence will not provide all-encompassing protection against a large-scale Russian attack, it can improve deterrence against Russia, reduce that country's coercive potential and promote cohesion within the Alliance. Nevertheless, ESSI raises strategic, technical-operational and political issues that do not yet appear to have been addressed. If these remain unresolved, the German initiative risks exacerbating European fragmentation at the political and technical level rather than promoting cohesion.

Strategic issues

Which threat analysis ESSI is based on and which capabilities the initiative is prioritizing are important questions that arise from a strategic perspective – not least in

relation to the goal of procuring the Arrow system and developing a missile defence capability in this area. Arrow is designed to defend against medium- and intermediate-range ballistic missiles outside the atmosphere, but it is questionable whether Russia possesses such weapons. Arguably, the only Russian system that falls into this category is the Kinzhal aeroballistic missile, which has a range of some 1,500–2,000 kilometres, according to Russian data. In Ukraine, however, Patriot has proved capable of intercepting Kinzhal.

At the same time, it is very difficult to predict Russia's future military procurement and development plans. For example, from the late 2000s onwards, Moscow developed the RS-26 Rubezh ballistic missile, which could fall into the intermediate-range category and thus be a potential target for Arrow; but its production was halted several years ago and the missile does not appear to have been introduced into the armed forces.

Another possibility is that Arrow could be used against Iskander-M missiles. For several years now, there has been speculation that the range of this weapon, which is officially declared to be a short-range missile, exceeds 500 kilometres. If it can indeed cover longer ranges and thus follow a higher trajectory, the Iskander-M could fall into Arrow's interception layer. In such a case, this system might well have an advantage over Patriot.

Nevertheless, the procurement of the Arrow system does not meet any of the capability targets that have been set for each of the Allies within the framework of the NATO Defence Planning Process (NDPP). While member states are free to acquire capabilities beyond those included in the NDPP, the view of the Alliance is that the NDPP goals should be prioritized. For this reason, NATO and some of its member states may question why Germany is prioritizing Arrow and not, for example, procuring more Patriot systems, which can counter both Russian short-range ballistic missiles and cruise missiles. Berlin's decision risks drawing criticism from NATO,

especially if, in the coming years, Germany fails to meet its NDPP capability targets in other areas.

Moreover, the procurement of Arrow could create points of friction within NATO's existing missile defence policy towards Russia. So far, the Alliance has identified two separate missions in the area of air and missile defence: NATO's IAMD, whose 360-degree approach includes defence against Russian shorter-range ballistic missiles; and NATO Ballistic Missile Defence (BMD), which is a component of NATO IAMD but is directed only against longer-range ballistic missile threats emanating from outside the Euro-Atlantic area – and thus not against Russia.

NATO has been pursuing this two-pronged approach for years, primarily to appease Russia. For its part, Moscow has long criticized US and NATO missile defence plans, arguing that they could undermine its strategic deterrence. The procurement of Arrow will certainly not weaken Russia's second-strike capability; nor is it likely that Moscow will strengthen its offensive missile posture simply because Arrow is being deployed. In any event, given the current geopolitical situation and Russia's conventional weaknesses, Russia is likely to seek to expand its missile arsenal in the coming years. Nevertheless, because Arrow is designed to intercept medium- and intermediate-range ballistic missiles outside the atmosphere, its procurement and deployment could fall between what have until now been the separate NATO IAMD and BMD missions. While one could argue that such a division is outdated and not formally binding for NATO, the failure of Germany to coordinate the procurement of Arrow with the Alliance could complicate NATO policy both internally and vis-à-vis Russia.

Technical-operational issues

At the technical-operational level, the main question concerns Arrow interoperability. A prerequisite for an effective integrated air and missile defence architecture is the interoperability of its individual compo-

nents. To this end, NATO IAMD is based on the NATO Integrated Air and Missile Defence System (NATINAMDS), which, in effect, is a network linking the Alliance's various sensors, command and control assets, and weapon systems.

Integration should not be a problem for the short-, medium- and long-range air defence systems procured within the framework of ESSI. However, it could prove more difficult with regard to Arrow, which is currently not interoperable with NATO systems. While the Alliance has mechanisms in place to determine the interoperability of newly procured systems, Israel and the United States would have to approve this step and provide the Alliance with sensitive data about Arrow. It is unclear, however, whether they would be willing to do so. So far, opinions in Berlin and Brussels seem to be divided over whether this system could be integrated into the NATO architecture.

Political issues

Finally, there are a number of political challenges. With ESSI, Berlin is pursuing the goal of procuring more air defence systems as quickly as possible and inviting partners to do the same in order to benefit from economic scale effects. However, because the choice of systems is rather narrow, the initiative could be unattractive to countries that have already procured or are in the process of procuring alternative air defence systems. This applies, first and foremost, to France and Italy, which are deploying the jointly developed SAMP/T (Sol-Air Moyenne Portée/Terrestre) system instead of Patriot. It also applies to Poland, which has been seeking to strengthen its air and missile defence capabilities for several years now. To this end, Warsaw is procuring both Patriot, in direct bilateral agreement with the United States, and the British CAMM (Common Anti-Air Modular Missiles), instead of the Iris-T SLM.

France, in particular, is critical of the German initiative. In principle, Paris supports the goal of strengthening European

air defence; but Berlin's plans to acquire Arrow has raised concerns in the French capital that they could signal to Russia that Germany does not trust NATO's deterrence, prompting Moscow to test the Alliance's resolve. At the same time, France criticizes Germany not only for investing in non-European capabilities such as Patriot but, more important, for incentivizing Allies to acquire such systems, instead of SAMPT, for example. In order to strengthen its own role in determining European air and missile defence plans and shape them according to its own interests, France hosted an air defence conference in mid-June, the focus of which was strategy and industrial policy issues – that is, the very issues over which Paris has criticized ESSI. At that conference, President Emmanuel Macron also announced that France, Estonia, Hungary, Cyprus and Belgium would jointly purchase the French Mistral, which is a very short-range air defence weapon system.

From a purely economic perspective, it may make sense for Germany to focus solely on those capabilities it wants to procure itself. But Berlin's approach could encourage uncoordinated steps in European air defence and weaken the political unity of the Alliance.

Recommendations

By focusing solely on procurement, ESSI is not realizing its full potential. Instead, it leaves important issues unresolved and thereby risks creating political tensions within NATO instead of strengthening the Alliance's cohesion vis-à-vis Russia. There are a number of steps that Germany could take to address these issues and live up to its aspirations of assuming a leadership role in air defence.

First, it could seek to expand the initiative. A possible goal would be not only to strengthen capabilities in the participating countries but also to enhance the air de-

fence of the Alliance as a whole, including coordination and interoperability at various levels. In addition to ESSI, there are various national and multinational procurement processes and initiatives under way to strengthen European air defence. In coordination with NATO, Berlin could invite all Allies – both within and outside ESSI – to take stock of national priorities, relevant capabilities and current procurement and development processes. Such an assessment and coordination of the various steps being taken could also benefit the defence planning of NATO's Supreme Allied Commander Europe (SACEUR). In this way, moreover, ESSI could contribute to the coordination of the various development processes currently taking place in air and missile defence at the European level.

Second, Berlin could further expand the initiative by seeking joint steps with NATO states beyond those countries participating in ESSI. Such steps could be taken in the areas of logistics, training, exercises, the joint use of infrastructure, maintenance, the development of operational concepts and even the establishment of joint units.

Third, as part of an expanded initiative, Berlin could seek discussions with NATO and individual Allies on the role of Arrow within the Alliance if the long-term plan is, in fact, to integrate Arrow into NATO structures. In particular, it should be discussed how Arrow could be incorporated into the overall air and missile defence strategy, especially with regard to NATO IAMD and BMD. At the same time, it should be made clear how Arrow could benefit the Allies in the long term.

In the short term, upgrading the initiative in this way would require considerable effort and coordination on the part of Berlin. But in the medium to long term, it could not only improve Germany's image as a leading nation in air defence but also create more sustainable technical solutions and strengthen the political cohesion of NATO.

Lydia Wachs is a researcher in the International Security Research Division. This paper is part of the Strategic Threat Analysis and Nuclear (Dis-) Order (STAND) project.

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