



DOCUMENTATION

This Issue’s “Documentation” section includes relevant select excerpts from the Fiscal Year 2024 National Defense Authorization Act (NDAA). The law authorizes defense funding and provides Congress an opportunity to set or comment on policy on a range of important defense and national-security issues. This year, these issues include U.S. missile defense policy, alliances in the Indo-Pacific, and nuclear matters, among many others. For example, the NDAA contains a provision to repeal the requirement for a review of nuclear deterrence postures. The *Journal* also features RADM Williams’s submitted statement from the House Armed Service’s Strategic Forces Subcommittee’s hearing on regional missile defense capabilities. The statement provides an overview of U.S. theater missile defense programs. Lastly, the “Documentation” section brings to a reader’s attention the Estonian Ministry of Defense’s proposal for a strategy to achieve Ukraine’s victory and Russia’s defeat. The proposal provides important guidelines behind which the West could unite in order to accomplish these vital objectives.

Document No. 1. Fiscal Year 2024 National Defense Authorization Act, Conference Report, Select Excerpts

SEC. 1301. SENSE OF CONGRESS ON DEFENSE ALLIANCES AND PARTNERSHIPS IN THE INDO-PACIFIC REGION.

It is the sense of Congress that the Secretary of Defense should continue efforts that strengthen United States defense alliances and partnerships in the Indo-Pacific region so as to further the comparative advantage of the United States in strategic competition with the People’s Republic of China, including by—

(1) enhancing cooperation with Japan, consistent with the Treaty of Mutual Cooperation and Security Between the United States of America and Japan, signed at Washington, January 19, 1960, including by developing advanced military capabilities, fostering interoperability across all domains, and improving sharing of information and intelligence;

(2) reinforcing the United States alliance with the Republic of Korea, including by maintaining the presence of approximately 28,500 members of the United States Armed Forces deployed to the country and affirming the United States commitment to extended deterrence using the full range of United States defense capabilities, and with deeper coordination on nuclear deterrence as highlighted in the Washington Declaration adopted by President Biden and President Yoon Suk Yeol during President Yoon Suk Yeol’s state visit on April 26, 2023, consistent with the Mutual Defense Treaty Between the United States and the Republic of Korea, signed at Washington, October 1, 1953, in support of the shared objective of a peaceful and stable Korean Peninsula;

(3) fostering bilateral and multilateral cooperation with Australia, consistent with the Security Treaty Between Australia, New Zealand, and the United States of America, signed at San Francisco, September 1, 1951, and through the partnership among Australia, the United Kingdom, and the United States (commonly known as “AUKUS”)—

(A) to advance shared security objectives;



(B) to accelerate the fielding of advanced military capabilities; and

(C) to build the capacity of emerging partners;

(4) advancing United States alliances with the Philippines and Thailand and United States partnerships with other partners in the Association of Southeast Asian Nations to enhance maritime domain awareness, promote sovereignty and territorial integrity, leverage technology and promote innovation, and support an open, inclusive, and rules-based regional architecture;

(5) broadening United States engagement with India, including through the Quadrilateral Security Dialogue—

(A) to advance the shared objective of a free and open Indo-Pacific region through bilateral and multilateral engagements and participation in military exercises, expanded defense trade, and collaboration on humanitarian aid and disaster response; and

(B) to enable greater cooperation on maritime security;

(6) strengthening the United States partnership with Taiwan, consistent with the Three Communiques, the Taiwan Relations Act (Public Law 96– 8; 22 U.S.C. 3301 et seq.), and the Six Assurances, with the goal of improving Taiwan’s defensive capabilities and promoting peaceful cross-strait relations;

(7) reinforcing the status of the Republic of Singapore as a Major Security Cooperation Partner of the United States and continuing to strengthen defense and security cooperation between the military forces of the Republic of Singapore and the Armed Forces of the United States, including through participation in combined exercises and training;

(8) engaging with the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, and other Pacific Island countries with the goal of strengthening regional security and addressing issues of mutual concern, including protecting fisheries from illegal, unreported, and unregulated fishing; and

(9) collaborating with Canada, the United Kingdom, France, and other members of the European Union and the North Atlantic Treaty Organization to build connectivity and advance a shared vision for the region that is principled, long-term, and anchored in democratic resilience.

SEC. 1631. ESTABLISHMENT OF MAJOR FORCE PROGRAM FOR NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS PROGRAMS.

Chapter 9 of title 10, United States Code, is amended by adding at the end the following new section: “**§ 239e. Nuclear command, control, and communications: major force program and budget assessment.**”

“(a) ESTABLISHMENT OF MAJOR FORCE PROGRAM.—The Secretary of Defense shall establish a unified major force program for nuclear command, control, and communications programs pursuant to section 222(b) of this title to prioritize such programs in accordance with the requirements of the Department of Defense and national security.

“(b) BUDGET ASSESSMENT.—(1) The Secretary shall include with the defense budget materials for each of fiscal years 2025 through 2030 a report on the budget for nuclear command, control, and communications programs of the Department of Defense.

[...]

SEC. 1633. AMENDMENT TO ANNUAL REPORT ON THE PLAN FOR THE NUCLEAR WEAPONS STOCKPILE, NUCLEAR WEAPONS COMPLEX, NUCLEAR WEAPONS DELIVERY SYSTEMS, AND NUCLEAR WEAPONS COMMAND AND CONTROL SYSTEMS.

Section 492a of title 10, United States Code, is amended by adding at the end the following new subsection:

“(d) INDEPENDENT ASSESSMENT BY UNITED STATES STRATEGIC COMMAND.—

“(1) IN GENERAL.—Not later than 150 days after the submission to Congress of the budget of the President under section 1105(a) of title 31, for each fiscal year the Commander of United States Strategic Command shall complete an independent assessment of any operational effects of the sufficiency of the execution, as of the date of the assessment, of the acquisition, construction, and recapitalization programs of the Department of Defense and the National Nuclear Security Administration to modernize the nuclear forces of the United States and meet current and future deterrence requirements.

“(2) CONTENTS.—Each assessment required under paragraph (1) shall include an evaluation of the ongoing execution of modernization programs associated with—

“(A) the nuclear weapons design, production, and sustainment infrastructure;

“(B) the nuclear weapons stockpile;

“(C) the delivery systems for nuclear weapons; and

“(D) the nuclear command, control, and communications system.

[...]

SEC. 1634. MATTERS RELATING TO THE ACQUISITION AND DEPLOYMENT OF THE SENTINEL INTERCONTINENTAL BALLISTIC MISSILE WEAPON SYSTEM.

[...]

(b) ASSESSMENT FOR NEEDED OR MODIFIED ACQUISITION AUTHORITIES.—

(1) ASSESSMENT REQUIRED.—The Secretary of the Air Force shall conduct an assessment of the Sentinel weapon system program to determine if any existing, modified, or new acquisition authorities could be used in future years to—

(A) ensure the program meets current timelines; or

(B) ensure the defense industrial base can adequately plan for and deliver components, subsystems, and systems in accordance with the integrated master schedule.

(2) MULTI-YEAR PROCUREMENT AUTHORITY.—

In conducting the assessment required under paragraph (1), the Secretary shall evaluate the potential need for multi-year procurement authority.

(3) REPORT.—Not later than 120 days after the date of the enactment of this Act, the Secretary of the Air Force shall submit to the congressional defense committees a report on the findings of the assessment required under paragraph (1). The report shall include—

(A) an identification of all authorities covered by the assessment;

(B) a determination of the effect of each such authority on the successful delivery of initial- and full-operational capability to the Sentinel weapon system program; and

(C) in the case of any new authority, an identification of the year during which the authority should be granted.

SEC. 1636. STUDY OF WEAPONS PROGRAMS THAT ALLOW ARMED FORCES TO ADDRESS HARD AND DEEPLY BURIED TARGETS.

Section 1674 of the National Defense Authorization Act for Fiscal Year 2023 (Public Law 117-263) is amended—

(1) in subsection (e), by inserting “or fiscal year 2024” after “2023”; and

(2) by adding at the end the following new subsection:

“(g) AUTHORIZATION.—For fiscal year 2024, the Secretary of Energy may carry out activities related to the development and modification of a nuclear weapon to provide near-term capabilities that address portions of the strategy required by subsection (b)(3) using amounts authorized and appropriated for the sustainment of the B83-1 nuclear gravity bomb.”.

SEC. 1637. REPEAL OF REQUIREMENT FOR REVIEW OF NUCLEAR DETERRENCE POSTURES.

Section 1753 of the National Defense Authorization Act for Fiscal Year 2020 (Public Law 116-92; 133 Stat. 1852) is repealed.

SEC. 1638. RETENTION OF CAPABILITY TO REDEPLOY MULTIPLE INDEPENDENTLY TARGETABLE REENTRY VEHICLES.

Section 1057 of the National Defense Authorization Act for Fiscal Year 2014 (Public Law 113-66; 10 U.S.C. 495 note) is amended by inserting “and Sentinel” after “Minuteman III” both places it appears.

SEC. 1639. AUTHORIZATION TO ESTABLISH TECHNOLOGY TRANSITION PROGRAM FOR STRATEGIC NUCLEAR DETERRENCE.

(a) IN GENERAL.—The Commander of Air Force Global Strike Command may, through the use of a partnership intermediary, establish a program—

(1) to carry out technology transition, digital engineering projects, and other innovation activities supporting the Air Force nuclear enterprise; and

(2) to identify capabilities for the Air Force nuclear enterprise that have the potential to generate life-cycle cost savings and provide data-driven approaches to resource allocation.

[...]

SEC. 1640. MATTERS RELATING TO THE NUCLEAR-ARMED, SEA-LAUNCHED CRUISE MISSILE.

(a) PROGRAM TREATMENT.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense, acting through the Under Secretary of Defense for Acquisition and Sustainment, shall—

(1) establish a program for the development of a nuclear-armed, sea-launched cruise missile capability;

(2) designate such program as a major defense acquisition program (as defined in section 4201 of title 10, United States Code) for which the milestone decision authority (as defined in section 4251 of such title) is the Under Secretary of Defense for Acquisition and Sustainment;

(3) initiate a nuclear weapon project for the W80–4 ALT warhead, at phase 6.2 of the phase 6.X process (relating to feasibility study and down select), to adapt such warhead for use with the capability described in paragraph (1);

(4) submit to the National Nuclear Security Administration a formal request, through the Nuclear Weapons Council, requesting that the Administration participate in and support the W80–4 ALT warhead project described in paragraph (3); and

(5) designate the Department of the Navy as the military department to lead the W80–4 ALT nuclear weapon project for the Department of Defense.

[...]

(b) INITIAL OPERATIONAL CAPABILITY.—The Secretary of Defense and the program and project described subsection (a) achieve initial operational capability, as defined jointly by the Secretary of the Navy and the Commander of the United States Strategic Command, by not later than September 30, 2034.

[...]

(c) **LIMITATION ON AUTHORITY TO APPROVE PRODUCTION.**—The Under Secretary of Defense for Acquisition and Sustainment may not approve a Full Rate Production Decision or authorize Full Scale Production (as those terms are defined in the memorandum of the Nuclear Weapons Council titled “Procedural Guidelines for the Phase 6.X Process” and dated April 19, 2000) for the W80–4 ALT project until authorized by Congress.

[...]

(e) **ASSESSMENT AND REPORT.**—

[...]

(1) **IN GENERAL.**—The Secretary of the Navy shall complete an assessment, in response to the courses of action developed by the Joint Staff in response to the report of the Secretary of Defense under subsection 1642(a) of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 (Public Law 117–263; 136 Stat. 2945), of the actions required to effectively deploy a nuclear sea launched cruise missile from a Virginia class submarine and such other platforms as the Secretary determines appropriate.

[...]

SEC. 1641. REQUIREMENTS RELATING TO OPERATIONAL SILOS FOR THE SENTINEL INTERCONTINENTAL BALLISTIC MISSILE.

The Secretary of the Air Force shall refurbish and make operable not fewer than 150 silos for the LGM–35A Sentinel intercontinental ballistic missile at each of the following locations:

- (1) Francis E. Warren Air Force Base, Laramie County, Wyoming.
- (2) Malmstrom Air Force Base, Cascade County, Montana.
- (3) Minot Air Force Base, Ward County, North Dakota.

SEC. 1642. LONG-TERM SUSTAINMENT OF SENTINEL ICBM GUIDANCE SYSTEM.

(a) **IN GENERAL.**—Prior to issuing a Milestone C decision for the program to develop the LGM–35A Sentinel intercontinental ballistic missile system (referred to in this section as the “Sentinel”), the Under Secretary of Defense for Acquisition and Sustainment shall certify to the congressional defense committees that there is a long-term capability in place to maintain and modernize the guidance system of the Sentinel over the full life cycle of the Sentinel.

[...]

SEC. 1644. OPERATIONAL TIMELINE FOR STRATEGIC AUTOMATED COMMAND AND CONTROL SYSTEM.

(a) IN GENERAL.—The Secretary of the Air Force shall develop a replacement of the Strategic Automated Command and Control System (SACCS) by not later than the date on which the LGM-35A Sentinel intercontinental ballistic missile program reaches initial operational capability.

[...]

SEC. 1645. PILOT PROGRAM ON DEVELOPMENT OF REENTRY VEHICLES AND RELATED SYSTEMS.

(a) IN GENERAL.—The Secretary of the Air Force may carry out a pilot program, to be known as the “Reentry Vehicle Flight Test Bed Program”, to assess the feasibility of providing regular flight test opportunities that support the development of reentry vehicles to—

- (1) facilitate technology upgrades tested in a realistic flight environment;
- (2) provide an enduring, high-cadence test bed to mature technologies for planned reentry vehicles; and
- (3) transition technologies developed under other programs and projects relating to long-range ballistic or hypersonic strike missiles from the research and development or prototyping phases into operational use.

[...]

SEC. 1646. PROHIBITION ON REDUCTION OF THE INTERCONTINENTAL BALLISTIC MISSILES OF THE UNITED STATES.

(a) PROHIBITION.—Except as provided in subsection (b), none of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2024 for the Department of Defense may be obligated or expended for the following, and the Department may not otherwise take any action to do the following:

- (1) Reduce, or prepare to reduce, the responsiveness or alert level of the intercontinental ballistic missiles of the United States.
- (2) Reduce, or prepare to reduce, the quantity of deployed intercontinental ballistic missiles of the United States to a number less than 400.

[...]

SEC. 1648. CONGRESSIONAL NOTIFICATION OF DECISION TO DELAY STRATEGIC DELIVERY SYSTEM TEST EVENT.

(a) NOTIFICATION.—Not later than five days after the Secretary of Defense makes a decision to delay a scheduled test event for a strategic delivery system, the Secretary shall submit to the congressional defense committees written notice of such decision.

(b) REPORT.—

(1) IN GENERAL.—Except as provided in paragraph (3), not later than 60 days after the submission of a notification required under subsection (a) with respect to a decision to delay a scheduled test event, the Secretary shall submit to the congressional defense committees a report on the decision.

[...]

SEC. 1649. CONGRESSIONAL NOTIFICATION OF NUCLEAR COOPERATION BETWEEN RUSSIA AND CHINA.

If the Commander of the United States Strategic Command determines, after consultation with the Director of the Defense Intelligence Agency, that militarily significant cooperation between the Russian Federation and the People's Republic of China related to nuclear or strategic capabilities is likely to occur or has likely occurred, the Commander shall submit to the congressional defense committees a notification of such determination that includes—

(1) a description of the military significant cooperation; and

(2) an assessment of the implication of such cooperation for the United States with respect to nuclear deterrence, extended deterrence, assurance, and defense.

SEC. 1650. PLAN FOR DECREASING THE TIME TO UPLOAD ADDITIONAL WARHEADS TO THE INTERCONTINENTAL BALLISTIC MISSILE FLEET.

(a) IN GENERAL.—The Secretary of the Air Force, in coordination with the Commander of the United States Strategic Command and the Assistant Secretary of Defense for Space Policy, shall develop a plan to decrease the amount of time required to upload additional warheads to the intercontinental ballistic missile force in the event Presidential direction is given to exercise such a plan.

[...]

(b) ELEMENTS.—The plan required by subsection (a) shall include the following:

(1) An assessment of the storage capacity of weapons storage areas and any weapons generation facilities at covered bases, including the capacity of each covered base to store additional warheads.

(2) An assessment of the current nuclear warhead transportation capacity and workforce of the National Nuclear Security Administration and associated timelines for transporting additional nuclear warheads to covered bases.

(3) An evaluation of the capacity and limitations of the maintenance squadrons and security forces at covered bases and the associated timelines for adding warheads to the intercontinental ballistic missile force.

(4) An identification of actions that would address any identified limitations to upload additional warheads.

(5) An evaluation of courses of actions to upload additional warheads to a portion of the intercontinental ballistic missile force.

(6) An assessment of the feasibility and advisability of initiating immediate deployment of W78 warheads to a single wing of the intercontinental ballistic missile force as a hedge against delay of the LGM-35A Sentinel intercontinental ballistic missile.

(7) Any policy considerations that would need to be addressed, including any guidance and direction that would be required, to execute the plan.

(8) An identification of all funding required to carry out actions identified in paragraphs (4) and (5).

[...]

SEC. 1663. NATIONAL MISSILE DEFENSE POLICY.

Subsection (a) of section 1681 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114-328; 10 U.S.C. 4205 note) is amended to read as follows:

“(a) POLICY.—It is the policy of the United States—

“(1) to research, develop, test, procure, deploy, and sustain, with funding subject to the annual authorization of appropriations for National Missile Defense, systems that provide effective, layered missile defense capabilities to defeat increasingly complex missile threats in all phases of flight; and

“(2) to rely on nuclear deterrence to address more sophisticated and larger quantity near-peer intercontinental missile threats to the homeland of the United States.”.

SEC. 1666. PROGRAMS TO ACHIEVE INITIAL AND FULL OPERATIONAL CAPABILITIES FOR THE GLIDE PHASE INTERCEPTOR PROGRAM.

(a) PROGRAM TO ACHIEVE INITIAL OPERATIONAL CAPABILITY.—

(1) IN GENERAL.—The Secretary of Defense, acting through the Director of the Missile Defense Agency and in coordination with the officials specified in subsection (d), shall carry out a program to achieve, by not later than December 31, 2029, an initial operational capability for the Glide Phase Interceptor as described in paragraph (2).

(2) REQUIRED CAPABILITIES.—For purposes of paragraph (1), the Glide Phase Interceptor program shall be considered to have achieved initial operational capability if—

(A) the Glide Phase Interceptor is capable of defeating, in the glide phase, any endo-atmospheric hypersonic vehicles that are known to the Department of Defense and fielded as of the date of the enactment of this Act; and

(B) not fewer than 12 Glide Phase Interceptor missiles have been fielded.

(b) PROGRAM TO ACHIEVE FULL OPERATIONAL CAPABILITY.—

(1) PROGRAM REQUIRED.—The Secretary of Defense, acting through the Director of the Missile Defense Agency and in coordination with the officials specified in subsection (d), shall carry out a program to achieve, by not later than December 31, 2032, full operational capability for the Glide Phase Interceptor as described in paragraph (2).

(2) REQUIRED CAPABILITIES.—For purposes of paragraph (1), the Glide Phase Interceptor program shall be considered to have achieved full operational capability if—

(A) the Glide Phase Interceptor is capable of defeating, in the glide phase, any endo-atmospheric hypersonic vehicles—

(i) that are known to the Department of Defense and fielded as of the date of the enactment of this Act; and

(ii) that the Department of Defense expects to be fielded before the end of 2040;

(B) not fewer than 24 Glide Phase Interceptor missiles have been fielded; and

(C) the Glide Phase Interceptor has the ability to be operated collaboratively with space based or terrestrial sensors that the Department of Defense expects to be deployed before the end of 2032.

[...]

SEC. 1668. LIMITATION ON AVAILABILITY OF FUNDS FOR OFFICE OF COST ASSESSMENT AND PROGRAM EVALUATION UNTIL SUBMISSION OF REPORT ON MISSILE DEFENSE ROLES AND RESPONSIBILITIES.

Of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2024 for operation and maintenance, Defense-wide, for the Office of Cost Assessment and program evaluation, not more than 50 percent may be obligated or expended until the date on which the Secretary of Defense submits to the congressional defense committees the report required by section 1675(b) of the National Defense Authorization Act for Fiscal Year 2022 (Public Law 117-81).

SEC. 1669. STRATEGY FOR INTEGRATED AIR AND MISSILE DEFENSE OF HAWAII AND THE INDO-PACIFIC REGION.

(a) STRATEGY.—

(1) IN GENERAL.—The Commander of United States Indo-Pacific Command, in coordination with the Under Secretary of Defense for Acquisition and Sustainment, the Under Secretary of Defense for Policy, the Commander of United States Northern Command, the Director of the Missile Defense Agency, and the Director of the Joint Integrated Air and Missile Defense Organization, shall develop a comprehensive strategy for developing, acquiring, and operationally establishing an integrated air and missile defense architecture for area of responsibility of the United States Indo-Pacific Command.

[...]

SEC. 1670. REPORT ON POTENTIAL ENHANCEMENTS TO INTEGRATED AIR AND MISSILE DEFENSE CAPABILITIES IN EUROPE.

19 (a) IN GENERAL.—Not later than 240 days after the date of the enactment of this Act, the Secretary of Defense, in consultation with the officials specified in subsection (c), shall submit to the congressional defense committees a report on potential enhancements to U.S. and allied air and missile defense capabilities that could contribute to the integrated air and missile defense capability of the North Atlantic Treaty Organization (NATO).

[...]

SEC. 1671. INDEPENDENT ANALYSIS OF SPACE-BASED MISSILE DEFENSE CAPABILITY.

(a) IN GENERAL.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense, acting through the Director of the Missile Defense Agency, shall seek to enter into an arrangement with an appropriate federally funded research and development center to update the study referred to in subsection (c).

[...]

SEC. 1690. RESEARCH AND ANALYSIS ON MULTIPOLAR DETERRENCE AND ESCALATION DYNAMICS.

(a) IN GENERAL.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense shall seek to enter into an agreement with a university affiliated research center with expertise in strategic deterrence to conduct research and analysis on multipolar deterrence and escalation dynamics.

[...]

SEC. 3117. PLUTONIUM MODERNIZATION PROGRAM MANAGEMENT.

Section 4219 of the Atomic Energy Defense Act (50 U.S.C. 2538a), as amended by section 3116, is further amended by adding at the end the following new subsection:

“(h) Not later than 570 days after the date of the enactment of this subsection, the Administrator for Nuclear Security shall ensure that the plutonium modernization program established by the Office of Defense Programs of the National Nuclear Security Administration, or any subsequently developed program designed to meet the requirements under subsection (a), is managed in accordance with the best

practices for schedule development and cost estimating of the Government Accountability Office.”.

SEC. 3126. LIMITATION ON AVAILABILITY OF FUNDS PENDING SUBMITTAL OF SPEND PLAN FOR DEVELOPMENT OF SEA-LAUNCHED CRUISE MISSILE WARHEAD.

Of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2024 for the Office of the Administrator for Nuclear Security, not more than 50 percent may be obligated or expended until the date on which the Administrator submits to the congressional defense committees the spend plan for the warhead associated with the sea-launched cruise missile required by section 1642(d) of the National Defense Authorization Act for Fiscal Year 2023 (Public Law 117-263; 136 Stat. 2946).

Document No. 2. Demand for Theater Missile Defense Assets, Statement by Rear Admiral Douglas L. Williams, USN, Director (Acting), Missile Defense Agency, Before the House Armed Services Committee Strategic Forces Subcommittee December 7, 2023

Chairman Lamborn, Ranking Member Moulton, and distinguished Members of the subcommittee, it is an honor to appear before you today to discuss the demand for U.S. theater missile defenses. The Missile Defense Agency (MDA) mission is to design, develop, and deploy a layered Missile Defense System to defend the United States and its deployed forces, allies, and international partners from increasingly diverse missile threats. Threats posed by missile delivery systems are likely to continue increasing and grow more complex. Adversary missile systems are showing more maneuver capability as well as greater survivability, reliability, and accuracy. MDA has already delivered significant capabilities to the Warfighter and is developing, delivering, sustaining, and improving affordable, proven, and leading-edge capabilities to counter advanced ballistic and hypersonic missiles in different regions of the world. In addition, MDA is actively supporting U.S. Central Command and our regional partners with analysis and assessments to detect, track, and intercept threats in the region.

Since its inception in 2002, MDA has developed numerous missile defense capabilities to enhance the regional defense posture of geographic Combatant Commanders. Utilizing its non-standard acquisition authorities, MDA has been able to quickly develop, procure, and field missile defense systems. In recent years, the Defense Department, with considerable input from the Combatant Commands, Services and MDA, has analyzed the missile defense system capability transfer process and agreed the current approach is the best course of action for the Department as outlined in the Department's May 2020 Report to Congress titled: "Transition of Ballistic Missile Defense Program Elements to the Military Departments." Under the agreed-to construct, once a missile defense system has been

fielded to a military department, the military department mans, operates, and sustains the service-common equipment of the missile defense system for the life cycle of the system. MDA modernizes, procures, and provides sustainment support of the missile defense system-unique equipment for the life cycle of system. This process is codified in cost-sharing agreements between the military departments and MDA. This construct enables MDA to continue to upgrade systems over time to achieve, for example, Terminal High Altitude Area Defense (THAAD) -PATRIOT integration, which enables Warfighters to improve self-defense, conserve interceptors, and enlarge coverage areas.

Over the years, MDA has transitioned operations and sustainment of critical theater missile defense capabilities to the military departments, including the Navy's Standard Missile (SM)-3, the Army's THAAD system and Army/Navy Transportable Radar Surveillance and Control – Model 2 (AN/TPY-2), and Space Force's ground-based radars, such as the Upgraded Early Warning Radars and Long Range Discrimination Radar for homeland defense. In the event of any future regional conflict, these systems will play a crucial role in protecting both U.S. and allied forces and key regional infrastructure.

Current Theater Missile Defense Capabilities

The Missile Defense System requires a Command and Control, Battle Management and Communication (C2BMC) system that operates in a Joint, multi-domain environment and connects ground, air, sea, and space sensors and shooters. This globally deployed system interfaces with Joint, Army, Navy, Air Force, Space Force, NATO and international commands and provides continuous, real-time Missile Defense Command and Control, and Battle Management operations to six Combatant Commands. It also integrates U.S. and coalition operations with allies and partners. The C2BMC program enables the U.S. President, Secretary of Defense, and Combatant Commanders at strategic, regional and operational levels to systematically plan missile defense operations, collectively see the battle develop, and dynamically manage networked sensors and weapons systems to achieve global and regional mission objectives. C2BMC provides a common operating missile defense picture for decision makers and the Combatant Commands and is capable of generating and distributing fire control quality data to enable, for example, Launch- and Engage-on- Remote capabilities. The Warfighter also uses this system to understand what is happening in real time in current conflict zones, such as Ukraine and the Middle East.

MDA jointly develops Aegis Ballistic Missile Defense (BMD) weapon systems for theater defense with the U.S. Navy. Globally deployed ship-based and land-based Aegis BMD capabilities are critical to the Nation's defense of our deployed forces, allies, and partners against short-, medium-, and intermediate-range missile threats. There are currently 49 Aegis BMD-capable ships with Aegis Ashore sites in Romania and Poland.

The SM-3, which uses hit-to-kill technologies, engages the target in space and is a key part of a layered theater missile defense architecture. The SM-3 Block (Blk) IA/IB provides BMD mission capabilities across Fleet areas of responsibility. The SM-3 also is a critical part of the European Phased Adaptive Approach (EPAA) Phases 1 and 2, which is the U.S.

contribution to NATO missile defenses. The SM-3 Blk IA/IB capability also support the defensive capability of Aegis Ashore.

SM-3 Blk IA/IB capabilities were first deployed in 2006 (for Blk IA) and 2013 (for Blk IB). This interceptor can be launched from BMD-capable ships as well as Aegis Ashore sites to defeat short- and medium-range ballistic missile threats. In October 2023, Flight Test Aegis Weapon System (FTM)-48 demonstrated an Aegis Weapon System Integrated Air and Missile Defense raid scenario consisting of BMD engagements of two short-range ballistic missile targets presented as a raid with two SM-3 Blk IA interceptors, while concurrently demonstrating Anti-Air Warfare engagements of two BQM-177A targets. This test was the first BMD raid engagement with SM-3 interceptors and was accomplished with the longest fielded SM-3 (Blk IA) variant, demonstrating residual capability against raids. Japan is currently a Foreign Military Sales (FMS) partner for the SM-3.

SM-3 Blk IIA capabilities, first deployed in 2021, were cooperatively developed by the United States and Japan to address rogue nation missile threats. SM-3 Blk IIA expands ship operational areas and increases the areas within which we can engage threats and the types of missiles the Navy can engage. Aegis Ashore Poland and the Blk IIA capability supports EPAA Phase 3. Engage-on-remote technologies further increase the Blk IIA engagement battlespace. The SM-3 Blk IIA increases capability in Defense of Japan scenarios and will eventually replace Japan's Blk IA inventory, along with FMS Blk IBs. Japan Flight Test Aegis Weapon System (JFTM)-07 was a four- event Japanese-funded FMS flight test campaign that was successfully executed in November 2022 to support the Japan Maritime Defense Force BMD modernization and certification of the Japanese Aegis Weapon System Baseline J7. All four JFTM-07 events were successfully executed and support the Japan Maritime Self Defense Force combat system certification of the SM-3 Blk IIA deployment and qualification of the Maya Class Destroyers. JFTM-07 was a significant milestone in the cooperation between Japan and the U.S. in the area of missile defense.

Aegis Ashore is a land-based variant of the Aegis BMD weapon system. Aegis Ashore Missile Defense System Romania (AAMDSRO) is located in Deveselu and is the first delivered and operational Aegis Ashore Missile Defense System. AAMDSRO was delivered to the U.S. Navy in May 2016 and joined the NATO Operational Capability in July 2016. AAMDSRO completes the EPAA Phase 2, which protects Europe against medium- and intermediate-range ballistic missiles and provides capability to launch SM-3 Blk IA, IB, and IIA missiles.

Aegis Ashore Poland, located in Redzikowo, was added to the Operational Capability Baseline in September 2023 with upgrades over the original design and state-of-the-art Integrated Electronic Security System. Aegis Ashore Poland was delivered to the U.S. Navy on October 1, 2023 for operational use and maintenance.

The Navy will formally accept Aegis Ashore Poland into their inventory on December 15, 2023. This will complete EPAA Phase 3, originally established in 2009. The Navy will install additional upgrades at Aegis Ashore Poland through May 2024, after which it will transfer to NATO in July 2024 for command and control of Aegis Ashore Poland in the defense of NATO European states against ballistic missile threats originating outside the Euro-Atlantic area.

The Aegis Ashore Missile Defense Test Complex (AAMDTC) is a test site only and is

located at the Pacific Missile Range Facility, Kauai, Hawaii. Initially developed to support Aegis Ashore fielding in Europe, AAMDTC has taken on a larger role to support Aegis BMD baseline integration and provide support for operational tests and innovation of new concepts and systems interoperability. With the delivery of Aegis Ashore Poland, the AAMDTC will continue to evolve with an increased focus on innovation, integration, test and operational support, all with a limited emergency activation capability to support the Missile Defense System.

Today, the SM-6, which uses a blast fragmentation kill mechanism, is the only interceptor available for a limited defense against hypersonic missile threats. Sea-Based Terminal (SBT) defense Increment (Inc) 1 initially fielded in 2016, and SBT Inc 2 was fielded in 2018. In March 2023, FTM-31 E1a successfully completed an endo-engagement with a salvo of two SM-6 Dual II missiles against a medium-range ballistic missile (MRBM) target. This test allowed MDA to add the SM-6 Blk IA Dual I and Dual II with Software Upgrade missiles to the Missile Defense System Operational Capability Baseline, adding significant defense capability to the Navy fleet against advanced threats.

MDA develops, produces, and fields the THAAD weapon systems for theater defense with the U.S. Army. The THAAD Weapon System is a globally transportable, ground-based system that is highly effective against short-, medium- and intermediate-range missile threats inside and outside the atmosphere in the terminal phase of flight. THAAD is combat-proven, and it has a perfect operational flight test record to date.

AN/TPY-2 radars deployed abroad support THAAD batteries for regional defense. These radars are also deployed abroad in forward-based mode to support regional and homeland defense by providing early warning, precision tracking, discrimination capabilities, and space domain awareness.

We have delivered 800 operational Interceptors to the U.S. Army and FMS customers as of October 23, 2023 and MDA continues to deliver and sustain THAAD interceptors in support of fielded U.S. batteries and FMS customers. Eight THAAD Batteries have been procured and seven are currently fielded to the U.S. Army to support the ballistic missile defense of the United States, its deployed forces, allies, and friends. The eighth THAAD Battery is currently in production and hardware availability will be in third quarter FY 2025.

MDA currently supports forward-deployment of two THAAD batteries stationed in the U.S. Indo-Pacific Command (INDOPACOM) area of responsibility under 94th Army Air and Missile Defense Command (AAMDC). One THAAD battery is forward deployed in U.S. Forces Korea (USFK) and one is forward deployed in Guam. As of November 17, 2023, both batteries are on THAAD System Build 4.0, which supports tighter integration between upper and lower tier missile defense systems in INDOPACOM. THAAD/MSE Integration was demonstrated during Flight Test THAAD Weapon System- 21 (FTT-21) in March 2022. All remaining U.S. THAAD batteries are on THAAD System Build 3.0 and are scheduled to be upgraded to THAAD 4.0 beginning in FY2024.

Improving Theater Missile Defenses

In line with the Department's *2022 Missile Defense Review*, MDA continues to strengthen defenses against all regional missile threats from any source, to include the development of active defenses against regional hypersonic missile threats, and pursue a resilient sensor network to characterize and track all hypersonic threats, improve attribution, and enable engagement. MDA also works closely with select Allies and partners to improve missile defense capability, integration, and interoperability. We are pursuing opportunities for joint research and development on hypersonic defense programs with key Allies and partners.

Current plans for improving Aegis BMD and THAAD system performance to meet increasingly sophisticated emerging threats involve the growth in the number of interceptors and system batteries and platforms to increase missile defense quantities and to improve the quality of missile defense through greater integration of deployed capabilities and development of systems. The missile proliferation challenge is expected to worsen and lead to diverse and unanticipated missile threats to the United States and our forces, allies, and partners.

MDA is continuing our cooperative missile defense relationship with Israel, jointly developing and delivering systems to strengthen their missile defenses and to increase interoperability between U.S. and Israeli forces. Our two nations continue to cooperate on engineering, development, co-production, testing, and fielding of the Arrow Weapon System, the David's Sling Weapon System, and co-production for the Iron Dome Defense System. I would like to highlight that since October 7, 2023, during Operation Swords of Iron, each of these multi-tiered defense elements have successfully intercepted multiple air and ballistic missile attacks against Israel and deployed US personnel. MDA will continue to work with Israel to enhance defense capabilities.

Growing Theater Missile Defense Inventory and Integration

In the President's Budget 2024, MDA will continue to meet the quickly advancing threat through improvements to the Aegis BMD capability, including procuring and delivering SM-3 Blk IB and Blk IIA missiles, improving SBT defense, advancing weapon system and missile reliability, and enhancing Aegis BMD engagement capacity and lethality. Deliveries of FMS SM-3 Blk IB and Blk IIA missiles are ongoing. The Navy Munitions Requirements Process (NMRP) aggregates the demand from each Combatant Command and informs MDA of the demand for SM-3 Blk IA, IB and IIA interceptors. By the end of FY 2025, we will increase capacity to 56 ships plus two Aegis Ashore sites (Romania and Poland), and by FY 2030 we will increase capacity to 69 ships.

MDA is working closely with the Navy to develop, field, and upgrade SBT defenses to counter more advanced maneuvering and hypersonic threats. SBT Inc 2 is deployed. MDA is analyzing the evasion maneuvers that hypersonic weapons may perform and addressing them in Aegis SBT Inc 3. SBT Inc 3 upgrade and delivery are in 2025 and include terminal defense capability against hypersonic threats. MDA will conduct flight tests against

advanced threat-representative targets in FY 2024 and FY 2025.

MDA will continue to produce THAAD interceptors to address the proliferating missile threat. Urgent Materiel Release for THAAD System Build 4.0 Global was granted by the US Army on September 27, 2023. One of the forward deployed INDO- PACOM batteries was upgraded to 4.0 Global in November 2023, and the remaining batteries will begin upgrades in 2024. Redesigned components are scheduled to enter into Interceptor production units in FY 2026. These hardware redesigns ensure production of THAAD Interceptors can continue uninterrupted and will also facilitate potential increases to THAAD Interceptor capability in future development increments.

THAAD/PATRIOT Missile Segment Enhancement (MSE) Integration capability TH 4.0 was fielded in October 2022 to U.S. Indo-Pacific Command Area of Responsibility. THAAD Weapon System integrates the Army's PATRIOT M903 MSE launchers and missiles into the system enabling a more tightly integrated upper/lower tier defensive capability. THAAD/MSE Integration enables increased Shoot-Assess- Shoot opportunities to conserve interceptors, improved self-defense without a dedicated PATRIOT battalion, additional engagement opportunities, and enhanced performance against ballistic missile threats.

New Theater Missile Defense Developments

The *2022 Missile Defense Review* encourages the development of new technologies and systems to hedge against continuing adversary missile developments and emerging capabilities. Future sensors must transition seamlessly between theater- level threats, to homeland defense, to global threats by sharing and transmitting data with command and control, and they must be Joint and all-domain integrated and have survivable command and control networks that allow for improvements to battle management.

The *2022 National Defense Strategy* and *Missile Defense Review* reference a layered defensive system to defend Guam. MDA will continue to support the Army to meet the INDOPACOM requirement to deliver a persistent 360-degree Integrated Air and Missile Defense (IAMD) layered capability to defend the people, infrastructure, and territory of Guam from the scope and scale of advanced ballistic, hypersonic, and cruise missile threats. The Guam Defense System integrates existing DoD systems and programs in development distributed across the island under a single command and control facility and organization. MDA's contribution includes the Aegis Guam System with AN/TPY-6 radar, SM-3, SM-6, THAAD Weapon System, and C2BMC.

Currently, the Ballistic Missile Defense System (BMDS) Overhead Persistent Infrared (OPIR) Architecture (BOA) integrates OPIR data from national overhead sensors to support Missile Defense System mission needs. BOA uses this data to detect, type, and track missile threats and then forwards track reports to C2BMC. C2BMC correlates BOA tracks with other sensor tracks and uses BOA data to cue downrange sensors.

MDA initiated the Hypersonic and Ballistic Tracking Space Sensor (HBTSS) program in 2018 to address the requirement to have capability to detect and track hypersonic threats and ballistic missiles much sooner than terrestrial radars. MDA is collaborating with the U.S.

Space Force's Space Development Agency (SDA) and Space Systems Command (SSC) to deliver integrated capabilities that meet Warfighter requirements for missile warning, tracking, and defense and to develop HBTSS as an OPIR sensor uniquely providing fire-control-quality data that will enable the engagement and defeat of advanced missile threats. HBTSS will track maneuvering threats that can otherwise evade terrestrial radars. Early next year, HBTSS will launch and begin demonstration of unique tracking and targeting capabilities needed to defend against hypersonic glide vehicles, followed by two years of on-orbit testing. Operationally, the HBTSS, a prototype demonstrator, will have a fire-control capability that will be part of SDA's Medium-Field-of-View sensors within the Proliferated Warfighter Space Architecture and provide hypersonic threat-tracking data for hand-off through linked missile defense weapons. Following the successful demonstration of HBTSS capabilities, the responsibility for HBTSS operational fielding will be transferred to Space Force and MDA will continue the development of the next generation of space-based fire-control sensors for missile defense.

Additionally, MDA is working closely with the Navy to develop, field, and upgrade SBT defenses to counter more advanced maneuvering and hypersonic threats. We anticipate delivering these SBT Inc 3 capabilities in 2025. We are also engaged in a competitive development effort to significantly enhance hypersonic missile defense capabilities. MDA is developing a layered defense capability against regional hypersonic threats and have initiated a development program for Glide Phase Intercept (GPI) to defend the sea-base and regional forces ashore, leveraging existing systems where possible, including proven engage-on-remote and launch-on-remote capabilities. Layered defenses provide more opportunities to engage and potentially neutralize hypersonic threats in-flight. We are focusing on the proven Aegis Weapon System to provide the depth-of-fire needed for a layered defense against hypersonic threats.

Today, MDA is funding technology maturation of two GPI concepts on the path to preliminary design.

The Aegis Sea-Based GPI, planned for delivery in 2034, includes the ability to plan, detect, track, and defeat threats, and support integrated layered multiple engagement opportunities. GPI is developing a missile and updates to the existing Aegis Weapon System to counter hypersonic threats. The GPI interceptor will be hypersonic, multistage, and compatible with the Navy's MK-41 Vertical Launch System. MDA also is pursuing a Cooperative Development of the GPI Interceptor with the Japan Ministry of Defense. This project will focus on interceptor updates, and the United States will be responsible for the overall missile system design and integration. Japan will fund and develop all Japan workshare elements (to include rocket motor assemblies and control systems)

THAAD System Build 5.0 is in development and is the largest hardware refresh to-date, with planned delivery in July 2026. TH 5.0 includes hardware upgrades that address obsolescence and enhances the mission assurance and cybersecurity posture of the weapon system. TH 5.0 incorporates system safety enhancements and engagement refinements resulting in improved performance against the current THAAD assessed threat set. A capability demonstration is planned for FTT-26 in 3QFY2027.

THAAD System Build 6.0 is planned to deliver in fourth quarter of calendar year 2027 and will provide the initial capability against non-ballistic threats and increase the threat engagement space. TH.6.0 will also improve THAAD Integration with the Army's Integrated Air and Missile Defense Battle Command System (IBCS) via Link-16 and continue to improve the cybersecurity risk posture and program protection. THAAD System Build 7.0 is planned to deliver in fourth quarter calendar year 2032 and allocates additional requirements to THAAD to increase threat space and engage representative threats. MDA is currently reviewing specific capabilities included in this future system build.

Chairman Lamborn, Ranking Member Moulton, Members of the Subcommittee, we are committed to addressing the theater missile threats of today and tomorrow by working with Warfighter to prioritize missile defense capabilities that allow us to protect our forces and our international partners and win regional engagements. I appreciate your continued support for MDA and the missile defense mission, and I look forward to answering the committee's questions. Thank you.

Document No. 3. *Setting Transatlantic Defence up for Success: A Military Strategy for Ukraine's Victory and Russia's Defeat, Discussion Paper, December 2023* (available at https://kaitseministeerium.ee/sites/default/files/setting_transatlantic_defence_up_for_success_0.pdf)

GLOSSARY

AFU	Armed Forces of Ukraine
ATACMS	Army Tactical Missile System
DCA	Defensive Counter Air
EUMAM	European Union Military Assistance Mission in support of Ukraine
EW	Electronic Warfare
GBAD	Ground-Based Air Defence
GMLRS	Guided Multiple Launch Rocket System
HIMARS	High Mobility Artillery Rocket System
IRIS-T SLM	InfraRed Imaging System Tail/Thrust Vector-Controlled, Surface-Launched Medium-Range
IRIS-T SLS	InfraRed Imaging System Tail/Thrust Vector-Controlled, Surface-Launched Short-Range
LRPF	Long-Range Precision Fires
MANPADS	Man-Portable Air-Defence Systems
NASAMS	National Advanced Surface-to-Air Missile System
R&D	Research & Development
RISS	Russia's Intelligence and Security Services
SAM	Surface-to-Air Missile
SAMP-T	Sol-Air Moyenne-Portée/Terrestre, Surface-to-Air Medium-Range/Land-Base
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicles
UDCG	Ukraine Defense Contact Group, also known as Ramstein Group or Ramstein Coalition
VKS	Воздушно-космические силы, Russian Aerospace Forces

In 1989, the fall of the Berlin Wall paved the way for a Europe ‘whole, free, and at peace’ – a vision set forth by President George H. W. Bush a few months earlier. The prospect that had been denied to generations before has thereafter evolved into the greatest success story for hundreds of millions of Europeans. Today, this very aspiration is at stake in Ukraine.

It is inherently simple to fall into a state of despair as Russia continues to wage its brutal war for the second year, with its appetite to inflict and sustain devastation seemingly endless and its war resources equally limitless. Shaping the information space in such a way is exactly what Russia is counting on – hoping to create gloom and defeatism amongst Ukrainians and their international supporters.

Let us not be misled that easily. It is we who have the upper hand in this fight.

Ukraine’s victory and Russia’s defeat in this war is achievable. In fact, this war can be won within the next three years or less, by adjusting and increasing the Euro-Atlantic community’s military production output and assistance to Ukraine, and imposing the perspective of an intolerable level of attrition on Russia.

A renewed strategy for providing the Armed Forces of Ukraine the necessary training and military equipment will bring about the conditions for defeating Russia’s imperialist theory of victory. With Ukraine’s admirable fighting spirit and the transatlantic community’s unparalleled military-technological advantage and resources, Ukraine’s victory will come at a fraction of the cost in comparison to the alternative consequences.

Furthermore, accelerated and scaled-up investments into defence industrial production that are critical for Ukraine will fundamentally contribute to NATO’s credibility, ability and readiness to provide for the deterrence and defence of the Euro-Atlantic area and beyond.

This military strategy will make way for a renewed and enduring vision of peace and strength, in conjunction with a revived Ukraine that is independent, sovereign, free in its entirety, and prospering as a fresh member of both the European Union and NATO.

Ending Russia’s war in Ukraine with Ukraine’s victory and Russia’s defeat is the single possible first step towards this aim.

TACKLING THE ABUNDANCE OF THREATS

The global security environment is spiralling downwards at a rapid pace. Freedom and democracies are increasingly threatened across continents. The Euro-Atlantic community faces a multitude of crises, which are increasingly declining into security challenges, that neither the United States nor Europe could tackle alone.

The credibility, capability and readiness of our deterrence posture and forward defences bear an essential role that will likely be tested at an unprecedented scale by adversarial powers and non-state actors for years to come – also after the war in Ukraine.

Our efforts and resources must be mobilised to this end immediately, because each delay will be converted into a high price to be paid, when history stops being on our side. Every characteristic of this moment is being shaped on the vast battlefields in Ukraine.

Russia remains the most significant and direct threat for Euro-Atlantic security. Russia has a long-term objective of fundamentally reshaping the security landscape to its liking.

Russia continues to demonstrate its intent and readiness to fulfil this objective in words and deeds alike.

While exact estimates vary, there is general consensus that *in the very short term* (up to 2 years) Russia lacks the conventional capability required for escalating against NATO directly, because of its force degradation and commitments in the Ukrainian theatre. Furthermore, the Russian state has mobilised its defence industry at a scale unseen in decades to wage this war against Ukraine and the negative effects are clearly visible in the Russian state and defence budgets and the economic environment.

However, *should Russia prevail in this war within the next 12-18 months*, it would validate its assumptions about our collective weakness that can militarily be challenged and exploited in the short term (up to 5 years). Favourable global developments and opportunities for Russia can further expedite such negative scenarios.

WAR OF ATTRITION

Together with global partners, the Euro-Atlantic community has contributed remarkably towards supporting Ukraine. Yet, escalation concerns have guided us to a strategy of attrition that fundamentally hinges on strategic patience.¹ This war can be won on the battlefield, but only after we have convincingly excluded the viability of any theory of victory in the heads of the Kremlin regime. While Russia is still impervious to the logic of reason, it is continuously sensitive to the logic of force.

The Russian strategic objective in Ukraine remains the subjugation of the country. To this end, the Russian military is operationally pursuing five lines of effort against Ukraine.

1. *Prolonging the conflict.* After Russia's initial plan of a quick capture of Ukraine failed, the Armed Forces of the Russian Federation have been seeking to protract the conflict on the ground through the deliberate defence in depth of occupied terrain, comprising about 18% of Ukraine – an area that would span over two thirds of the Baltic states, and that is larger than the individual territories of more than 30 other countries in Europe. By fighting from prepared positions, Russia can ensure that Ukrainian territory would not be liberated rapidly, if at all, and only with a heavy expenditure of personnel and materiel.
2. *Expanding the occupied territory.* While Russian-controlled Ukrainian territory has more than doubled compared to 23 February 2022, from 42,000 km² to 108,000 km², Russia continues to attempt offensive operations with formed elements of its ground forces to try and further expand the occupied territories, at a minimum to the administrative borders of the annexed oblasts of Donetsk, Kherson, Luhansk and Zaporizhzhia. Ukraine's defences, Russia's limited training capacity and operational

¹ For more, see discussion paper Russia's War in Ukraine: Myths and Lessons at https://kaitseministeerium.ee/sites/default/files/myths_and_lessons_0.pdf.

pressures have prevented these efforts from making headway, but attempts persist nevertheless. Russia has conquered more land in 2023 than it has lost².

3. *Exhausting Ukraine's sustainability.* A sustained long-range precision strike campaign, combined with the intent to blockade and disrupt Ukraine's Black Sea ports, is aimed at the economic paralysis of Ukraine, making it almost entirely dependent upon its international partners.
4. *Destroying critical assets.* Russia conducts strikes against critical national infrastructure, with the aim of making Ukraine's cities uninhabitable in winter. Furthermore, the exhaustion of Ukraine's air defence network would allow the Russian Aerospace Forces (VKS³) to commence medium altitude bombing over the front, enabling the destruction of Ukrainian ground forces.
5. *Undermining resolve.* An unconventional campaign waged by Russia's Intelligence and Security Services (RISS) and cohered by the Centres of Special Influence under the Presidential Administration is orchestrating active measures aimed at undermining the political support for Ukraine among its international partners.⁴

Russia's regime remains confident that it has more resolve than we do, still believing it is able to outlast Ukraine and the Euro-Atlantic community. Whether this conviction is based on facts and analysis or fundamental misinformation is insignificant. It is clear that our strategy so far has not convinced the Russian regime in its cost-benefit calculation to bring them to the conclusion that they can only lose. As things stand:

1. The Russian military leadership assesses that it can sustain losses in fighting forces and military materiel for longer than the Armed Forces of Ukraine (AFU). Thus, even the ineptly executed operations will ultimately weaken and defeat Ukraine's ability to absorb Russian attacks indefinitely.
2. Russian industry, including in cooperation with other adversarial powers (notably Iran⁵ and North Korea⁶), is aiming to outperform and outproduce the Western industrial base in the quantity of war materiel supplied. Mass matters, particularly when concerns about escalation risk and exposing technological advancements on the battlefield persist.
3. By protracting the conflict, Russia seeks to exhaust our collective will to support Ukraine. Deeming democracies an inherently inferior form of governance, the Kremlin regime is convinced that our centre of gravity – democratic unity – can be successfully challenged and defeated.

² J. Holder, Who's Gaining Ground in Ukraine? This Year, No One., The New York Times, 28 September 2023.

³ Воздушно-космические силы

⁴ V. Bergengruen, Inside Russia's Year of Ukraine Propaganda, Time, 22 February 2023.

⁵ D. Bennett and M. Ilyushina, Inside the Russian effort to build 6,000 attack drones with Iran's help, The Washington Post, 17 August 2023.

⁶ J. Byrne, J. Byrne, G. Somerville, Report: The Orient Express: North Korea's Clandestine Supply Route to Russia, Royal United Services Institute, 16 October 2023.

4. The long-range strike campaign is executed in the belief that Russian munitions will exhaust Western interceptors. Offensive, deep strike capabilities are inherently cheaper than defensive systems, while NATO Allies have reservations about providing them and capability gaps in both categories.
5. By targeting these long-range strikes at civilian infrastructure, Russia aims to cause painful civilian losses, migration surges and social tensions. Russia is convinced that eventually the will and morale of the Ukrainian people would begin to break down and force the Ukrainian leadership to seek negotiations from a position of weakness, having no other choice than to make territorial and political concessions to Russia.
6. On the occupied territories, Russia's Intelligence and Security Services are conducting a brutal and methodical KGB-style repression campaign aimed at the liquidation of potential resistance cells, filtrating the population, suppressing any expression of Ukrainian culture, and progressively integrating occupied areas into Russia's domestic security and administrative structures⁷.
7. Internationally, Russia is working to build an axis power of countries willing to work with the Kremlin in defiance of international sanctions. Further efforts are targeted at bringing about Western demand and pressure against Ukraine for ending the war.

SETTING UKRAINE UP FOR SUCCESS

We are in the midst of a battle of wills. Our strategic task is to change Russia's war calculation and remove any outlook for success via military force or diplomatic means at the expense of Ukraine. The prospect of Ukraine having no other choice than to negotiate with Russia from a position of weakness is not only daunting, but undercuts our values, interests and objectives.

It is pertinent to follow a renewed military strategy that will ensure Ukraine's victory, Russia's defeat, and sets the transatlantic defence up for success.

With decisive political will, we can afford to increase both military and economic pressure and bring attrition on the Russian side in the war against Ukraine to a breaking point.

We are larger than the task. The sheer size of our collective political, economic and military power should guarantee a victory over Russia. The Ukraine Defense Contact Group (UDCG), also known as the Ramstein group, has a combined GDP of €47 trillion. Total commitments of military aid to Ukraine⁸ thus far are around €95 billion – *0.2% of that*. At the same time, the combined defence budgets of the Ramstein coalition are more than 13 times greater than Russia's heavily inflated one: €1.24 trillion against €0.09 trillion in 2023. There should be no doubt in who has the advantage to prevail.

⁷ J. Watling, O. V. Danylyuk, N. Reynolds, Preliminary Lessons from Russia's Unconventional Operations During the Russo-Ukrainian War, February 2022-February 2023, Royal United Services Institute, 29 March 2023.

⁸ All data on military aid to Ukraine here and hereafter: Kiel Institute for the World Economy, Ukraine Support Tracker, total commitments of military aid from 24 January 2022 until 31 July 2023, published on 7 September 2023.

Waging the war in Ukraine costs Russia around a *trillion rubles* (€10.2 billion per current exchange rate) per month in military expenses alone. Assessments suggest that hidden war-related expenditures veiled under a variety of other categories in the federal budget could account for an extra 30% on top of this, co-funding by regions and private entities further adding to the total.⁹ Meanwhile, the Ramstein coalition's *monthly cost of military support averages at €5.3 billion* (including still undelivered and multi-year commitments).

Russia's military budget for 2023, after being doubled mid-year, comprises a third of the entire federal budget. A similar share (29.4%) has been planned for military expenditure in 2024, effectively at the expense of essential state functions such as education, healthcare, infrastructure, and social policy.¹⁰ Concurrently, the war effort is biting into Russia's National Wealth Fund reserves substantially and at a significant pace – and will almost certainly continue to do so as long as the war lasts. Given the setbacks in health and social sphere budgets as well as the announced increase of pensions¹¹, other federal funds such as The Pension Fund of the Russian Federation and The Federal Fund for Mandatory Medical Insurance are unlikely to provide any shelter for uncovered costs.

The international sanctions regime has limited Russia's access to additional financial instruments, reduced government revenues from key sources such as oil and gas, and could do more with enhanced targeting and enforcement. Russia therefore increasingly faces the *prospect of consistent and expanding war costs flooding the budgetary agenda under the conditions of rapidly declining resources and a very short stack of backup plans*. Internal means such as further cuts into budget sectors outside military needs, further tax increases and emissions of government bonds for the internal market or even bypassing the law to go for the central bank's reserves could provide temporary refuge, but would either risk straining the tolerance limits of the society or offer a shortlived extra resource.

By credibly preparing and signalling readiness for a long war and boosting our support to Ukraine accordingly, the *sustained war cost and particularly its enduring outlook for Russia can be raised to the level, where it becomes intolerable for the Kremlin*. The stronger Ukraine is, the sooner this tipping point could be reached.

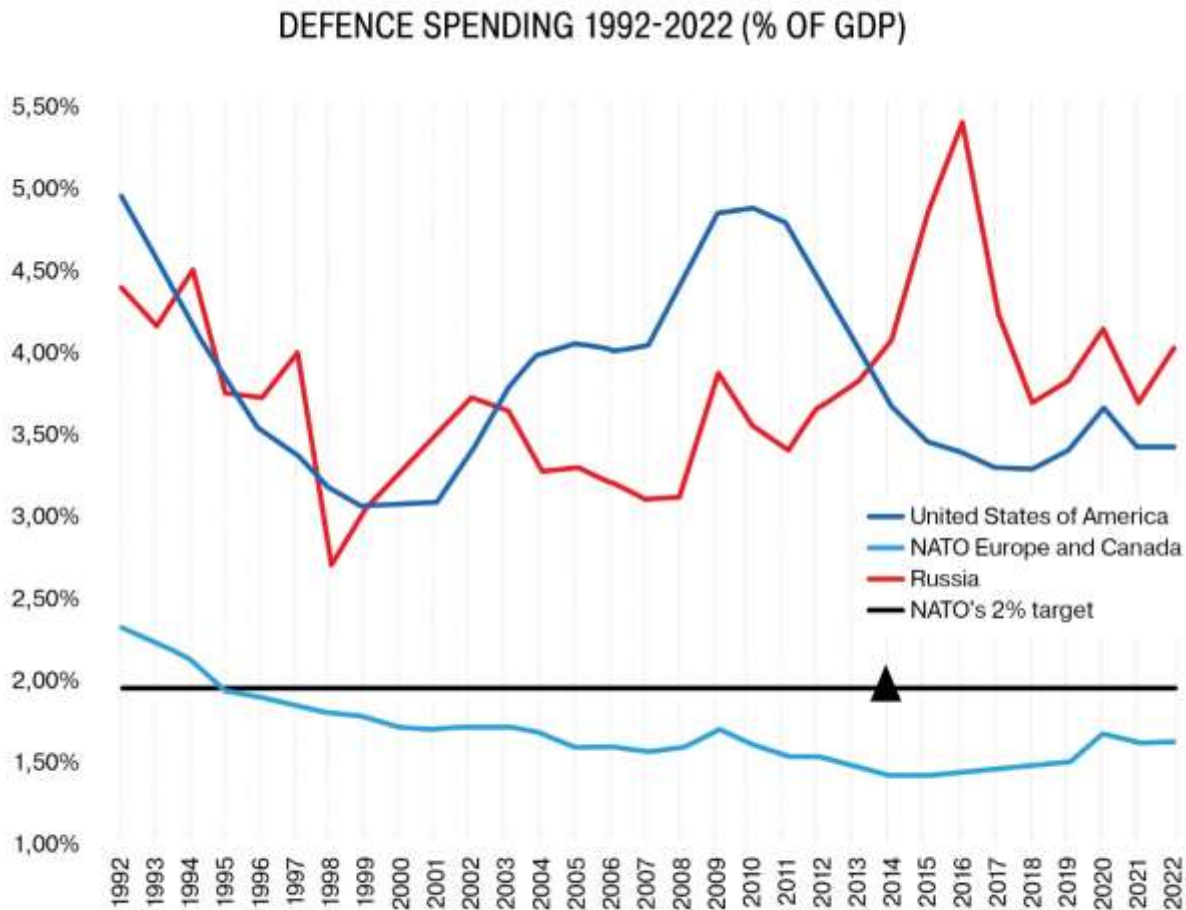
The immediate and urgent objective is changing Russia's assessment that the war could be wrapped up in 2024. Instead, 2024 will be a year of *strategic defence for Ukraine* – a time to build up the necessary military and industrial base to defeat Russia.

To this end, it is pertinent to support the training of the Armed Forces of Ukraine (AFU) and tailor the defence industrial output accordingly to *provide the AFU the artillery, munitions, UAVs, strike systems, air defences and fighter aircraft required to liberate their territory*. Investment in the production of these capabilities at scale is also critical for delivering NATO's strategy for the defence of the Euro-Atlantic Area, and meeting Allied commitments made at the NATO Summits in Vilnius and Madrid.

⁹ B. Grozovski, Russia's Unprecedented War Budget Explained, Wilson Center, 7 September 2023.

¹⁰ D. Korsunskaya and A. Marrow, 'Everything for the front': Russia allots a third of 2024 spending to defence, Reuters, 2 October 2023.

¹¹ The State Duma, С 1 января 2024 года страховые пенсии по старости вырастут на 7,5 %, 14 November 2023.



Defence spending from 1992 to 2022 as share of GDP. Based on information from the Stockholm International Peace Research Institute (SIPRI) Military Expenditure Database, <https://www.sipri.org/databases/milex>.

Most NATO Allies have significantly depleted their already small conventional military stockpiles and capabilities by donating their equipment to Ukraine. The Allies also have a very limited industrial base that is unfit for meeting the security challenges of the 21st century and unable to reconstitute these capabilities unless defence investments are substantially and urgently increased.

This state of affairs is the direct outcome of a decades-long underinvestment in defence. The inability of 20 out of 31 Allies to meet the Defence Investment Pledge to spend at least 2% of GDP is *limiting our combined defence budget by €79 billion this year alone*¹². The total deficit since 2014 amounts to more than €920 billion. While the defence budgets in absolute figures have slightly increased throughout most of the past decade, the average yearly

¹² All data on NATO defence expenditure here and hereafter unless stated otherwise: NATO Public Diplomacy Division, Defence Expenditure of NATO Countries (2014-2023), 7 July 2023.

growth in real terms¹³ among European NATO members and Canada collectively remains around €10 billion – below 1% of NATO’s total budget estimate this year.

THE TASK

In order to bring about Russia’s defeat in Ukraine, it is necessary for Ukraine and its partners to pursue the following operational objectives:

Circumventing Russian defences by

- severing Russia’s ground lines of communication and making resupplying troops (either under the threat of artillery or by air and sea) disproportionately costly and more time-consuming,
- inflicting sustained and increased attrition on Russian forces,
- sea denial to the Russian Black Sea fleet,
- conducting a sustained campaign to degrade Russian Aerospace Forces (VKS),
- training and preparing Ukrainian forces to be able to undertake offensive operations at an increased scale.

Continue to blunt Russian offensive operations

- If undisrupted, *Russia has the capacity to train approximately 130,000 troops every six months into cohered units and formations available for launching operations. Additional troops can be mobilised and pushed into Ukraine as untrained replacements, but these do not provide effective combat power.*
- The Russian training system can be put under pressure and disrupted by inflicting sustained and increased attrition on Russian units in Ukraine, forcing the newly mobilised personnel to be deployed to the theatre prematurely. This would constrain the Russian training system to deliver *approximately 40,000 additional troops* instead of 130,000 every six months as cohered units (command and control, artillery, and other critical personnel must be trained to create a unit of action, irrespective of its size). Deployments above this figure would serve as rapidly expendable gap fillers rather than an offensive fighting force.
- The objective therefore should be to inflict a sustained rate of attrition of *at least 50,000 killed and severely wounded Russian troops per six months to consistently degrade the quality of Russian force*, preventing Russia from regenerating offensive combat power – which Ukraine has so far successfully achieved.
- Additional quantitative and qualitative training of Ukraine’s troops, together with the necessary military assistance, will further increase Russia’s attrition, forcing Russia to enact full national mobilisation – accelerating the desired attrition rate and increasing the risk of domestic strife for the Russian regime.

¹³ Based on 2015 prices and exchange rates.

Economic curtailment of Russian defence industrial output to increase the cost and consequences of military attrition

- It is a priority to move from the passive passing of sanctions to their proactive and aggressive enforcement, combined with the use of economic coercion to constrain trade with Russia. The acquiescence of several states with significant exposure to the EU in enabling Russian evasion of sanctions and export controls must be robustly contested.
- Russia's war resources should be diminished by all means. Following the initial effects of measures such as the oil price cap adopted by G7 and the EU, Russia has found ways to successfully circumvent these, returning its oil and gas revenues to a steady increase recently. With the oil and gas sales accounting for more than 28% of Russia's budget proceeds,¹⁴ properly targeted and effectively enforced measures can provide a powerful tool for stifling the inflow to Russia's war chest.

Raising the cost of the war of aggression by allocating Russia's confiscated or frozen assets for the benefit of Ukraine

- With more than €330 billion frozen by the international community, of which more than €200 billion are controlled by the EU, it is necessary to create a credible leverage, which would ensure that these funds would not be returned to Russia, unless a full withdrawal from the sovereign territory of Ukraine in its internationally recognized borders is completed and attacks on Ukraine are ceased. Whilst the EU leaders have taken the first steps to use the profits from these assets,¹⁵ further ones are needed. Additionally, the implementation of this measure serves as a powerful and credible political and military tool to deter other malign actors in the future.

Manpower

To enable the Armed Forces of Ukraine to liberate key objectives, it is necessary to provide sufficient training to expand the scale at which the AFU can conduct operations. At present, the AFU are unable to reliably train inside Ukraine above company-level because of the long-range strike threat to training areas. Ukrainian units therefore struggle to operate in a synchronised way in larger formations above a company.

Ukraine's army expanded from 150,000 ground forces to over 700,000 in 2022, while over the course of 2022 there was heavy attrition among experienced field officers and soldiers alike. As a result, AFU brigades lack sufficiently trained staff officers to enact commander's intent and synchronise the actions of sub-units laterally. The effective span of control of a brigade for offensive operations is therefore approximately two companies. The

¹⁴ Russian oil and gas budget revenues more than doubled in October, Reuters, 3 November 2023.

¹⁵ P. Tamma, J. Barigazzi, L. Hülsemann, EU leaders approve using profits from frozen Russian assets, Politico, 27 October 2023.

result is that the AFU plans and executes operations with a horizon of exploitation limited to approximately 1200 meters. Furthermore, larger formations are missing or are not structured as combat formations.

By the end of 2023, European training efforts under the EU Military Assistance Mission in support of Ukraine (EUMAM) and the UK-led Operation Interflex will have collectively trained 60,000 Ukrainian troops. With additional training provided by the United States and the greater coalition, the total Western effort since Russia's full-blown invasion in February 2022 has therefore reached close to 100,000 personnel over 20 months. The 30,000-troop European effort is estimated to have cost slightly over €100 million, *placing the total cost estimate as low as approximately €350 million* (or €3500 per trained soldier).

Despite this, the training was set up when Ukraine desperately needed more trained soldiers to defend an extended front. Because speed mattered, and defensive operations are simpler than offensive operations, training was expedited to five weeks. This is not sufficient to prepare soldiers for offensive operations. During the Second World War, British infantry would receive over 20 weeks of training before they were considered basically proficient and the U.S. Army operated with 13-17 weeks of basic training.¹⁶ We must therefore develop our training packages to better prepare our Ukrainian partners for offensive operations.

It is time for us set new objectives, a new pace and a new standard of quality in training Ukrainian troops. In 2024, the aim should be to expand Ukrainian operations from brigade enabled company actions, to the ability to execute brigade attacks. In 2025, the aim should be for the AFU to conduct simultaneous brigade attacks, enabled by larger formations at a joint level.

There are three critical lines of effort in enabling this expansion of the scale of Ukrainian offensive operations:

1. *Staff officers need to be trained to work at brigade and battalion levels to plan, synchronise, and control a greater span of battlespace.* Leadership courses for field grade officers can contribute towards this, provided that the syllabus taught is tailored to build upon rather than supplant the existing workflow of Ukrainian command posts. Therefore, the syllabi must be drafted based upon the observation of these command posts. Considerable improvements could be brought about in 2024 already, starting with a 10-week training programme building on the skills of an initial cadre of 250 officers, which can enable conducting battalion-plus sized attacks. At the same time, it is highly likely that better training could limit losses among officers, therefore extending the sustainability of Ukrainian forces.
2. *Collective training in Europe at a battalion level needs to be expanded and extended to give Ukrainian units that are rotated out the ability to improve their cohesion at echelon.* It is critical that exercises at a battalion level would be supported by the necessary policies and permissions to realistically simulate battlefield realities in Ukraine, particularly including the density of unmanned aerial systems (UAS).

¹⁶ J. Anderson-Colon, Marine Corps Boot Camp during World War II: The Gateway to the Corps' Success at Iwo Jima, Marine Corps History, Vol 7 No 1 Summer 2021.

Repetitions are vital in order to improve tactical battle drills. Costwise, a two-week exercise for an infantry battalion costs around €1 million only.

3. At present, Ukrainian fire control systems limit the ability to concentrate fire missions. There is a significant cost to replacing these because personnel knows how to use them. *Working with the Ukrainians to continue to develop the command and control tools* they employ to increase the scale of effects the AFU can coordinate will be vital if increased manoeuvre forces are to be supported by appropriate fires and electronic warfare.

While the needs for basic and specialist training persist, it is a matter of priority to expand the scope of the AFU in order to allow turning overall manpower into an even more lethal fighting power.

Each of these lines of effort can bring enormous improvement to AFU in support of scaling the reach and effect of its operations, for a modest amount of resources and within a relatively short timeframe. In return, it will provide a highly cost-effective and attainable toolbox for promoting Ukraine's success on the battlefield.

Hardware

Artillery

For both Russia and Ukraine, artillery is the primary means of destruction of troops. Whoever retains fire superiority retains the initiative. Ensuring the sustainment of Ukraine's fires is therefore critical for both attack and defence.

Europe and the U.S. alike have directed their efforts towards meeting Ukraine's artillery requirements, providing hundreds of platforms along with millions of ammunition rounds in total. Advanced systems such as MLRS and HIMARS, as well as long-range strike missiles have proved crucial in striking operationally significant targets, while the frontlines continue to require a sufficient supply of ammunition for shorter ranges. The EU has delivered around 300,000 out of the one million artillery rounds agreed, in addition to earlier bilateral contributions. The U.S. has provided more than 2,000,000 155mm artillery rounds, complemented by more than a million rounds of other calibres.

Allied 155mm artillery systems outrange equivalent Russian 152mm systems, have a higher rate of fire, and better accuracy. Ukraine requires a minimum of 200,000 rounds per month to retain localised fire superiority. Sustaining this rate of fire will empty European and U.S. stockpiles over 2024 and will require significant foreign purchases of ammunition. *Allies can ramp up their munitions production to meet this rate by 2025 at the latest. While transparency on both European companies' current production rates as well as planned increases remains limited, estimates based on public data would place the 2023 rate between 480,000 and 700,000 rounds. Current monthly figures could therefore average at 50,000 rounds, doubling the capacity from early 2023. The U.S. has similarly doubled its monthly production since early 2023, now producing 28,000 rounds per month, and aiming to reach the 100,000 per month rate by end of 2025. Meeting Ukraine's minimum demand*

rate collectively during 2025 would *therefore require a European effort of 140% increase over 2024.*

Efforts to increase European production have been stymied by each European state pursuing separate – and relatively small – orders from industry. The business case presented by these orders does not justify defence manufacturers increasing production capacity, because there is no clarity on the scale of orders over time. European Allies and Member States therefore should work together to consolidate orders into larger and longer term contracts that would justify investment in production capacity in the defence industrial base.

Russia's total production and recovery of artillery ammunition will reach 3.5 million units in 2023, representing a more than threefold increase from the previous year's production. In 2024, production and recovery will increase further and would likely reach up to 4.5 million units. This volume significantly exceeds the amount of artillery ammunition available to Ukraine. If the Ramstein coalition is unable to ensure the sufficient increase in ammunition production and supply to Ukraine as a matter of urgency, Russia's advantage in the use of artillery ammunition and thus in the war will increase.

An additional limiting factor so far in the sustainability of Ukrainian fires is artillery barrels. It is assessed that *Ukraine will need 1500-2000 barrels per year* with each unit costing up to €900,000. Given the limited number of barrel machines, particular focus should be provided for companies to expand barrel manufacturing. The United States and the European Allies need to critically reassess the unsustainable fragmentation that has led to Ukraine using at least 17 different artillery platforms. The goal should be to reduce this number by several times.

Another assurance of Ukraine's fire superiority is to force the dispersal of logistics for Russia's fires through the persistent threat of Guided Multiple Launch Rocket System (GMLRS) strikes. 24 GMLRS rockets per day has been sufficient to achieve the suppression of Russian fires. GMLRS are also vital for the large number of European armies purchasing HIMARS. As a minimum, industrial investment therefore should *aim to provide Ukraine a supply of 8760 GMLRS per year by 2025.* To date, Lockheed Martin has produced more than 60,000 in total¹⁷, and is aiming to up its current full annual capacity of 10,000 to 14,000 in 2024¹⁸. With the estimated cost per one rocket approximately €160,000, the total cost of minimum military requirement annually is *approximately €1.4 billion.*¹⁹

The targeting of Russia's air defence systems and thereafter targets of strategic significance in depth, including infrastructure, C2 nodes, airheads, and assets of the Black Sea fleet requires the *continued provision of long-range strike systems.* The effect delivered by the air-launched cruise missile Storm Shadow can be extended via the employment of the air-launched cruise missile Taurus and the Army Tactical Missile System (ATACMS) in the short-term.

¹⁷ Lockheed Martin, GMLRS: The Precision Fires Go-To Round, accessed 24 November 2023.

¹⁸ S. Skove, Why It's Hard to Double GMLRS Production, Defense One, 30 March 2023.

¹⁹ D. Parsons, Ukraine To Get Guided Rockets, But Not Ones Able To Reach Far Into Russia (Updated), The Drive, 31 May 2022.

While the U.S. continues its long-range precision fires programme (LRPF), by introducing the Army's Precision Strike Missile (PrSM), the Strategic Mid-Range Fires, and the developmental Long-Range Hypersonic Weapon (LRHW), it is equally *critical that Europe invests in renewed production of relevant long-range strike systems*, such as SPEAR-4 and SCALP-EG.

However, those programmes will also require additional investment and prioritisation as they are currently configured around the assumption that rounds would be created by *refurbishing and upgrading existing stocks* – most of which have since been supplied to Ukraine. To underpin the sustainability of this production for the defence requirements of the Euro-Atlantic Area, the assurance of European access to relevant supply chains is equally necessary. A critical capability in this regard is the manufacture of explosive energetics. There is a strong argument for the EU to pioneer the funding of R&D of new explosive energetics and new methods of manufacturing.

European funding could further support the manufacture of legacy Soviet materiel, including 152mm ammunition and barrels. This could have a significant short term benefit for Ukraine as it would extend the timeframe over which a large number of its own Soviet legacy systems can be used. However, it makes less sense to replace the barrels on these systems.

Refurbishing expired ammunition is another alternative for temporarily mitigating the constraints on new production. It is assessed that the EU could refurbish approx. 15,000 rounds per month. *Refurbishment is estimated to be priced at 30-50% of the new ammunition price*, while delivery times could be considerably faster. The feasibility of this line of effort depends on the readiness of the countries with stocks of suitable ammunition as well as the availability of components required for the refurbishment process.

Consideration should be given to the extent to which specialised munitions, including sensor-fused munitions and thermobaric payloads, are priorities for production. Although such specifics would considerably increase the cost per munition, they would also reduce the number of rounds the AFU must fire to deliver the necessary scale of effect. Yearly production rates of such munitions currently remain very limited, but increasing these capacities would concurrently allow Allies to better meet NATO's future requirements.

Unmanned Aerial Vehicles

The most efficient means of maximising the situational awareness of the force and the accuracy of artillery are Unmanned Aerial Vehicles (UAVs).

The demand for UAVs is ubiquitous, with a density of approximately two per platoon of infantry deployed, three per artillery battery, and five per battalion command post. The sophistication and requirements for UAVs increase by echelon as the area of interest extends further into the enemy deep. All classes of UAVs have a limited life expectancy. Tactical systems at the platoon level may last half a day; long-range UAVs often have a lifespan of up to 16 flight hours. The demand for UAVs at all levels is constant and increasing.

Both Russia and Ukraine are heavily dependent upon Chinese DJI UAVs. Having conquered the civilian market, DJI benefits from a sufficient economy of scale to produce the necessary number of airframes at a viable price point. NATO manufactured UAVs are often just as effective as DJIs, but are orders of magnitude more expensive because they are produced at small scale, for limited numbers of orders and almost exclusively for military customers.

For NATO members to meet Ukraine's and their own needs for UAVs in conflict and to have a resilient supply chain to build them, it is necessary for Europe to *make a simple platoon UAV at scale*. The aim should be to produce *5000 per month at a price below €2500 per unit (€150 million annually)*. These same UAVs should be used to compete with DJI on the civilian market, while regulatory measures should also be explored, as the manufacturer's collection of vast amounts of data across European civilian and military enterprises is a threat to national security²⁰.

In addition, European NATO members *must collaborate to scale the production of fixed wing UAVs* with a range beyond 80 km that are able to transmit data in real time and reliably fly in a dense electronic warfare (EW) and GPS-denied environment. This should be able to operate day or night, have a modular payload, and fly at medium altitude. It should be producible at a unit price below *€200,000 and in volumes of at least 3168 airframes per year (€633.6 million annually)*.

Although basic designs that can be scaled are important, it is also vital that the sensors and software enabling UAVs to fly can be iteratively updated to stay ahead of counter-UAV capabilities. No UAV should therefore be seen as a finished product, but must instead be understood as an evolving capability. For this reason, the UAV should have an open architecture and contracts should avoid capture by a single company to manage the updates of its software and payloads.

If UAVs are able to iteratively develop, then it is necessary to have a regulatory environment where each alteration to the UAV does not require recertification of its airworthiness. Furthermore, if the regulatory threshold for a UAV to fly remains comparable to an aircraft, then it is unlikely that a competitive price point or the required agility can be met as the overheads in production become too onerous. It is therefore critical for NATO countries to *develop legislation to enable a competitive UAV industry*.

The development of one-way attack UAVs will likely remain more fragmented, because it is precisely in the diversity of threats and their operating logic that such capabilities retain their effectiveness. Scaling such capabilities is persistently difficult because of the development of hard and effective counters by the adversary.

Ground-Based Air Defence

The exhaustion of Ukraine's air defence system would enable the Russian Aerospace Forces (VKS) to bomb from medium altitude and decisively shift the balance of advantage in the

²⁰ D. Shepardson, US House panel seeks ban on federal purchases of China drones, Reuters, 1 November 2023.

war. Allies have already provided Ukraine various air defence systems, such as the Patriot, Hawk, IRIS-T, NASAMS, and Gepards. Yet, as Russia continues to focus its efforts on effectively wearing out Ukraine's air defence assets, it is crucial that partners help make Ukraine's Ground-Based Air Defence (GBAD) sustainable.

Russia has significantly expanded the production of various long-range strike systems. This includes stockpiling approximately 1500 Shahed one-way-attack UAVs, now produced in Russia, alongside cruise missiles, ballistic missiles and aero-ballistic missiles²¹. In October 2022, it was producing approximately 40 such systems per month. A year later it is now producing approximately 100. Production could reach 200 strike systems per month over 2024. With intercepts usually requiring the launch of two interceptors, this suggests that there is a *sustained demand trending towards 400 interceptors per month* as a requirement, noting that some missiles will get through undefended sectors, and some will be shot down by other systems such as man-portable air-defence systems (MANPADS).

Russia has had very little success in its periodic efforts to destroy Ukrainian long range surface-to-air missile (SAM) systems, so the bulk of Ukraine's upgraded Soviet-origin S-300 systems remain intact. However, ammunition stocks are heavily depleted. Efforts by Ukraine's partners to source additional SAM ammunition for the S-300 from third party nations around the world have been essential to sustaining air defence coverage. Ukraine's partners should *assist the local defence industry in producing these interceptors*.

Ukraine's SA-11 'Buk' and SA-8 'Osa' tactical SAM systems are the reason why Russia has not been able to establish air superiority and defeat Ukraine. As with S-300, there is also a shortage of ammunition. *Acquiring additional missiles for Ukraine's SA-11 'Buk' systems* should be a short-term priority to manage the transition to other systems. European allies need to continue to support efforts to *develop and integrate alternative ammunition for existing SA-11 launchers*, such as Hawk missiles of which there remain significant stocks.

The U.S. is addressing this gap with its so-called FrankenSAM project²², designed to combine elements of Western and Soviet systems into operative air defence assets, such as Western-calibre surface-to-air missiles with refitted Soviet-era launchers or radars. While the project is limited in scope due to its experimental nature, the pilot successes have reached the front lines and suggest the efforts are worth continuing. Further European options should be explored.

As expected, the Patriot system supplied to Ukraine in late 2022 has performed exceptionally well against cruise and ballistic missiles. It will be critical for defeating Iskander and Kinzhal missiles. However, the number of batteries is still limited and can only provide coverage over a few key areas at any given time. With competing demands from the Indo-Pacific and the Middle-East theatres, the production is limited and ammunition demand is substantial. To date, Raytheon has produced over 240 systems²³ and the company is

²¹ Kh-555, Kh-101, 3M54-1 Kalibr, 9M727, 9M723, Kh-47M2 Kinzhal

²² L. Jakes, Desperate for Air Defense, Ukraine Pushes U.S. for 'Franken' Weapons, The New York Times, 28 October 2023.

²³ Raytheon, Global Patriot Solutions, accessed 28 November 2023.

poised to increase annual production to 12 systems total, with one battery costing approximately over €1 billion²⁴.

To help alleviate this bottleneck, European nations should substantially invest in the *increased production capacity of launchers, radars and interceptors for complementary systems such as SAMP-T, NASAMS, Sky Sabre, Narew, and IRIS-T SLM*, which are also highly effective against most Russian missile types and can reduce the pressure on Patriot and S-300 over time.

European states should also *manufacture and supply additional NASAMS and IRIS-T short and medium-range (SLS and SLM) systems* to allow these to be used more in the tactical role near the frontlines, slowly replacing the Buk and Osa systems that currently form the backbone of tactical air defence for the AFU.

Current European production capacity of the required systems remains very limited in both quantity and speed: based on narrow public sources, annual production figures per system are still in single-digit figures²⁵, while delivery and replacement times exceed years²⁶. Ground-based air defence systems are also critically needed to improve NATO's own air and missile defence, so significantly enhanced production capacity would almost certainly be utilised for some time even after the conflict and decrease unit costs for NATO nations.

Fighter Aircraft

Ultimately, Ukraine will need to supplement its air defences with defensive counter air (DCA) sorties by the Ukrainian Air Force. The Ukrainian Air Force will therefore need Western Fighter Aircraft by 2025 to sustain DCA.

The Netherlands, Denmark, Norway and Belgium have already committed to donating F-16 fighter jets to Ukraine. While the total number of the jets is undisclosed, the first deliveries are scheduled to take place before the end of this year, with additional ones spread over 2024 and 2025. A number of Allies will contribute to Ukrainian pilots' training, lasting between five to eight months²⁷. Beyond flight training, the F-16s require significant logistics and maintenance training for ground support personnel to ensure that the aircrafts remain combat capable, as well as appropriate equipment and infrastructure for operating and maintaining the fighters.

Considering additional possibilities of the Euro-Atlantic fleet, Gripen C/D could be a suitable platform to be supplied alongside the longer-term F-16 plan.²⁸ Gripen was designed

²⁴ Congressional Research Service, IF12297: PATRIOT Air and Missile Defense System for Ukraine, 18 January 2023.

²⁵ German arms maker Diehl to ramp up production of IRIS-T air defence system, Reuters, 5 September 2023.

²⁶ C. Pocock, MBDA Accelerates Missile Production in Response to Ukraine War, Aviation International News, 17 March 2023.

²⁷ Statement on a joint coalition on F-16 training of the Ukrainian Air Force, Diplomatic statement by the Ministers of Defence of Belgium, Canada, Denmark, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Sweden and the United Kingdom, 7 November 2023

²⁸ J. Bronk, N. Reynolds, J. Watling, The Russian Air War and Ukrainian Requirements for Air Defence, Royal United Services Institute, 7 November 2022.

for efficient dispersed multirole operations against Russian forces, while fighting outnumbered from relatively rough dispersed locations. As such, it is designed to be serviced, refuelled and rearmed on road bases by teams of five conscripts with 2-3 months training led by a single more experienced supervisor, using universal tools carried on two light vehicles – therefore, requiring less to enable Ukrainian teams to operate the jets rapidly in-country. Gripen can carry and fire an effective European-produced Meteor air-to-air missile.

With this longer ranged missile capability (and internal electronic warfare suited for self-defence), Gripen would allow Ukrainian pilots to be effective in smaller numbers as a deterrent to Russian aircraft near the front, since they would not have to rely on more complex tactics in large, self-supporting formations. For achieving DCA capacity, Ukraine would need 20 aircraft for two squadrons of eight each, to fly 2x two-ships per day, plus four reserves/attrition replacements. The total cost estimate for the aircraft would be around €3 billion, with additional export agreement and supply from European Meteor partner nations.

Maintenance, Repair and Recovery

Maintenance of equipment, its recovery, and repair are all key factors to the sustainability of the force. This line of effort gains particularly critical importance during the upcoming months, while coalition donations of new equipment narrow down due to increasingly limited stocks, and as additional production has not yet picked up the necessary pace at scale to meet the supply needs.²⁹ Expanding the training to maintain donated systems and to avoid cannibalisation, where possible, will therefore be important in increasing the availability of key systems at the front.

BRACING UKRAINE AND OURSELVES

The world continues to witness the courageous fight of the Ukrainian people and its Armed Forces against Russia's brutal war of aggression. The international community has come together in an unprecedented unity of effort by supporting Ukraine with military, humanitarian and economic assistance and by imposing sanctions against Russia.

Ukraine's resistance has been greatly empowered by the European and American weapons that conjointly have squashed the Kremlin regime's dreams of a quick and easy military victory, decimated some of the best units of the Russian Armed Forces, and liberated sizeable parts of Ukraine's occupied territories. The arsenal of democracy is fulfilling its mission in Ukraine's hands.

Ukraine's victory remains our shared goal, enforcing the lesson that aggression will never pay off and will always backfire. The Kremlin regime is sorely mistaken in its belief that by

²⁹ P. McLeary, Allies' 'main effort' for Ukraine shifting from donating weapons to fixing them, Politico, 19 July 2023.

gearing for a multi-year conflict and by switching to a war-time economy, they could outlast and outperform us. In fact, Russia has yet to see our real strength.

Collectively, we can and we will win the war of attrition against Russia. We can pave the way for the Ukrainian Armed Forces to defeat Russia militarily, provided that we start building now. Together, it is affordable and viable.

2024 will provide a building year for beefing up Ukraine's manpower and lifting the production volumes of critical equipment and ammunition to required levels. This will put Ukraine in a position of strategic defence.

The current stance on the battlefield enables a shift into positional warfare that would favour Ukraine. Complemented by precision strikes into Russia's depth – targeted at wearing out Russia's command and control, logistics and a variety of operationally significant targets –, will allow Ukraine to limit the attrition rate, reconstitute its forces, ration systems and supply, while keeping Russia at bay. Even as it would provide Russia time to bolster its own efforts, it will lack the necessary offensive power for decisive action.

By 2025, the collective efforts in support of Ukraine will have provided a sufficient increase of critical skills, capabilities and stockpiles for Ukraine, unlocking the power for inflicting the required level of attrition on Russia. Concurrently, it will send a powerful deterrence message to any state or non-state actor globally of what the real cost of aggression against the Euro-Atlantic community will be.

CONCLUSION: A STRATEGY OF SUCCESS

The success that allows NATO to celebrate its 75th anniversary in 2024 was shaped in the vast battlefields of Europe and the Pacific by shared values, tremendous sacrifices and immense resources – a battle of wills on a scale unprecedented in contemporary history.

Similarly, the outcome of Russia's aggression war will be a defining moment for the future of Ukraine and the Euro-Atlantic area. Anything short of Ukraine's victory – whereby its desired sovereignty and territorial integrity is respected – will be a strategic and costly mistake that will reverberate across the world. It will set a dangerous blueprint and opportunity for adversarial powers to challenge us again.

At a time when freedom is on the line, the sacrifices of the greatest generation must not only be remembered, but fundamentally defended. To date, all members of the Euro-Atlantic community have given some, but a lot of Ukrainians have given their all.

With its enduring strategic objectives set on redrawing the map of Europe, including by re-establishing spheres of influence and recreating buffer zones, the Kremlin regime questions the very existence of Ukraine and threatens NATO. Russia will rebuild its military posture to achieve its aims and, depending on the outcome of the fighting in Ukraine, could have significant conventional forces, supported by a fully mobilised defence industry, in a position to threaten European security in the very near-term.

Setting transatlantic defence up for success against this threat requires a renewed political will and resource commitment, worthy of the past and present sacrifices. Effectively, committing merely *0.25% of GDP* annually towards military assistance to Ukraine would

provide approximately €120 billion – more than sufficient resources to implement this strategy.

It is only appropriate that *this would be agreed upon at the level of Heads of State and Government under the auspices of the Ramstein coalition.*

Having trained close to 100,000 Ukrainian fighters for the total cost of approximately 350 million euros only, there is ample capacity to scale up training, but even more so – *increase and focus on setting and implementing new qualitative targets to the Armed Forces of Ukraine to fight properly at battalion, brigade and higher echelon levels.*

While not an exhaustive list, this strategy identifies and sets the required production volumes for *artillery, UAVs, ground-based air defence, fighter aircrafts, and the associated stocks of ammunition as the most significant capabilities that shape the battlefield.* A unity of effort is required to consolidate, coordinate and ramp up overall production of existing capabilities to desired levels. Capability coalitions being formed within the Ramstein group are already laying down important groundwork in several priority areas.

Ukraine has succeeded in killing or severely wounding at least 50,000 Russian troops per every six months on the battlefield. By redoubling our military support efforts, the attrition pace of Russian manpower and particularly the associated military equipment is bound to accelerate to unsustainable levels for Russia, whilst simultaneously decreasing Ukraine's attrition.

From a historic and strategic perspective, this cost to the Euro-Atlantic community of further arming and training Ukraine and accelerating investments into defence is both *affordable and sustainable.* The defeat of Russian forces in Ukraine and the maximal attrition of its military is also a direct means of lowering the threshold of what is needed to achieve conventional deterrence in Europe. And lastly, the increased investment commitments into defence will *directly translate into accelerated and expanded defence-industrial output* that is urgently required to address the threats and adversarial powers across the globe.

Guided by this reinforced vision and strategy, *2024 will be a year of strategic build-up and defence for both Ukraine and the Euro-Atlantic community.* It will continue to systematically attrite Russian economy, finances, manpower and equipment, before the pace and outlook of defeat for Russia will rapidly accelerate through 2025 as the United States' and Europe's defence-industrial output reaches new levels. With that ever-growing and strengthening resolve, *Ukraine will indeed win and Russia will lose by 2026 the latest.*