NATO Science & Technology Strategy

Defending the future, today!

Endorsed by NATO Defence Ministers on 5 June 2025

Why Science & Technology Matters to the Alliance

Science & technology (S&T) is the bedrock of our modern society, ensuring our prosperity and driving our progress. While serving overarching societal purposes, S&T is a major driver of decisive advantage across all Instruments of Power in the 21st century. In a rapidly evolving global security environment, with rising geopolitical instability and increasing reliance on technology, S&T is a crucial contributor to the Alliance's continuous success. Consequently, the Alliance, working with like-minded partners, must enhance and protect its S&T base.

Continued investment in S&T strengthens NATO's and Allies' ability to outperform the challengers of today and tomorrow, ensuring the Alliance remains robust, resilient, and ready to respond to any threat. To preserve this ability in the future, a need for greater investment in S&T must be recognised. The 2022 NATO Strategic Concept emphasizes the investment in technology across NATO's three core tasks: deterrence and defence; crisis prevention and management; and cooperative security. NATO's Warfighting Capstone Concept highlights the need to draw military advantage from technology by adopting emerging and disruptive technologies to support warfighting, while ensuring defensive capacity to counter the adversarial use of these technologies.

Russia and terrorist groups will continue to threaten the Alliance, whilst China's strategic ambitions to acquire global influence, including through technological leadership, will continue to grow. The unprecedented dynamics introduced by new technologies, new strategic ambitions, and new actors disrupt the evolved global security environment and continuously shape the battlespace.

In order to derive decisive advantage from technology across all Instruments of Power, the Alliance cannot solely rely on developing superior technology alone. Rather, the Alliance must accelerate the adoption of emerging technologies and the adaptation of established ways of technology use, so that technologies are fully integrated with their human, organisational, and operational contexts. Rapidly operationalizing technologies requires resourcing and synchronization at a level that does not exist in NATO at this time. Furthermore, the Alliance must carefully consider the trade-offs between very few, very costly and sophisticated high-tech assets on the one hand and masses of cheap and sufficiently effective low-tech kit on the other.

Founded on a vibrant and diverse knowledge base, the NATO S&T Enterprise is the driving force for conducting S&T and exploiting the results across the Alliance's core tasks. By pursuing this S&T Vision, the Alliance demonstrates global leadership and strengthens its Instruments of Power in order to promote peace, prosperity and progress.

Vision

The NATO S&T Enterprise is resourced, safeguarded and energised to enable the Alliance to outperform strategic competitors and potential adversaries in rapidly inserting scientific knowledge and adopting emerging technologies across all Alliance core tasks.

The enduring success of the Alliance is founded on political unity, military might, as well as scientific excellence and technological prowess. S&T paves the way towards the future, advising and shaping today's planning, policy- and decision-making, as well as enabling military supremacy to yield effective deterrence and successful defence.

S&T is a whole-of-government responsibility that supports national security across all Instruments of Power. S&T is also of whole-of-society relevance, involving non-government actors such as industry and academia. In this wider context and with a renewed strategic relevance, S&T delivers a range of individual and collective strategic benefits:

- **Defence and security-related S&T** provides the foundation for developing future capabilities, while underpinning the delivery of planned capabilities and advising on the operation of current capabilities;
- It promotes interoperability across military domains, across Nations, and between current, planned, and future systems;
- It benefits from a whole-of-science approach to explore the full potential of dual-use technologies and to adapt and adopt them for defence purposes, recognising that scientific research is initially application-agnostic, while very few technologies are defence-specific;
- It contributes to the technological capabilities of our defence industries and thus to the sovereignty of Allies' decision-making.
- **S&T in general** delivers evidence-based advice to political and military decision-makers to inform policy-making, defence planning and procurement about essential S&T trends and the risks, opportunities, and choices regarding emerging and potentially disruptive technologies;
- It facilitates trusted partnerships through science diplomacy, building on the international collaboration that is in the nature of science itself;
- It supports all Instruments of Power and contributes to wider policy areas, such as societal resilience, climate change, critical infrastructure protection, or the security of supply chains.

The NATO S&T Enterprise

S&T becomes tangible in our equipment, tools, techniques, infrastructures, and ways of managing our affairs. But it originates from a common knowledge base that comprises our scientists, analysts, researchers, engineers, and experts, as much as the ideas that they generate, share, and mature.

The Nations provide the bedrock of NATO's knowledge base through their national education systems, their research facilities and laboratories, their academia and industry. The NATO S&T Enterprise thus thrives on the Nations' continued investments in people and in programmes, as its competence, capacity, agility, and durability are shaped by the Nations' sovereign policy and funding decisions across various branches of government.

Opposite: The NATO S&T Enterprise and the communities it is composed of.

Mission

The NATO S&T Enterprise maintains a collaborative world-class knowledge base and translates its scientific excellence and technological prowess into decisive advantages for the Alliance's Instruments of Power.

The NATO S&T Enterprise comprises the National and NATO experts with their competences and ideas, together with the fora and networks that NATO provides to enable the dynamic collaboration both, amongst these experts and between the experts and the end-users of their results. Drawing on this knowledge base, the Enterprise provides the foundation for Nations and NATO to develop and deliver military capability, it helps to build trusted partnerships beyond the Alliance and delivers evidence-based, timely and targeted advice to planners and decision makers. Ultimately, the Enterprise supports the Alliance's warfighters and defence planners, policy-makers and diplomats across the core tasks of deterrence and defence, crisis management and prevention, and cooperative security.

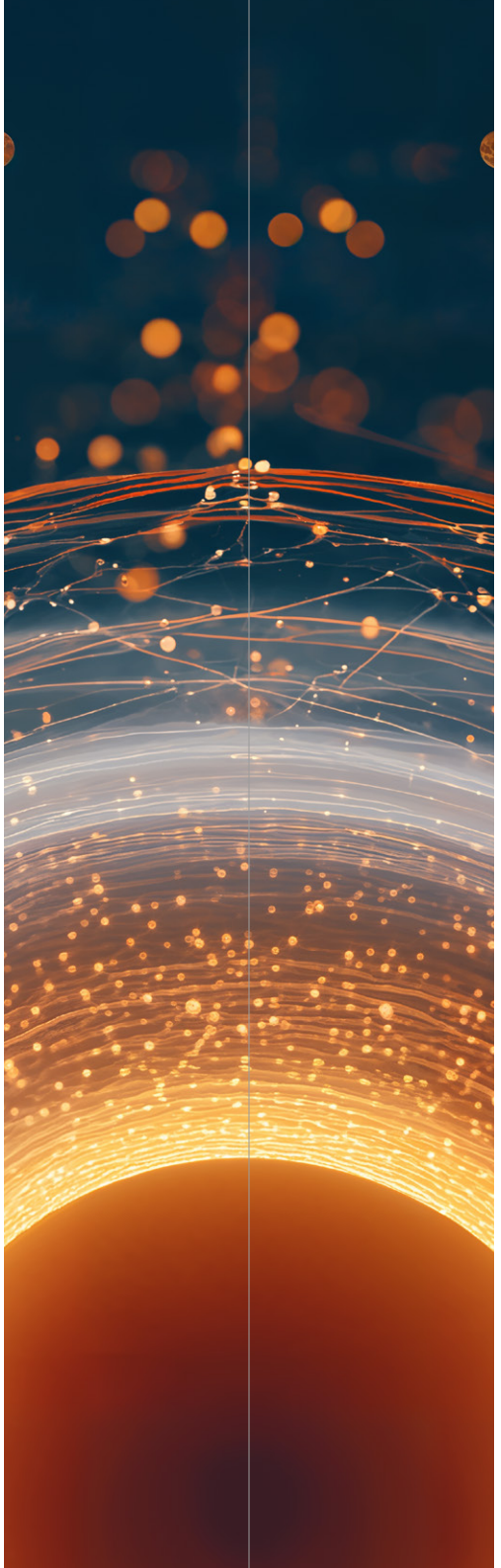
The NATO S&T Enterprise is organised through a variety of NATO committees, commands, agencies, staffs and programmes. Each of these entities has been established independently, some of them actively conducting S&T, with others exploiting S&T results. By federating these entities under a shared vision and a common mission and thus strengthening their collaboration, the Enterprise maximizes the benefits that Nations, NATO, and the Alliance as a whole derive from S&T.

The NATO **Science & Technology Organization** (STO) is chartered to act as the focal point of coordination across all S&T-related activities in NATO and to deliver evidence-based advice to senior policy and decision makers. Both roles are based on the STO's substantial Programme of Work, which is delivered by Allied and Partner Nations conducting collaborative research and promoting information exchange, and by a dedicated Centre for applied maritime research, prototyping, experimentation and testing.

The majority of the members of the NATO S&T Enterprise are focused on developing and delivering military capabilities.

In the **military community**, under the leadership of the Military Committee (MC), Allied Command Transformation (ACT) serves as the warfare development command that defines the military capability requirements of the Alliance and promotes technology adoption in the military. At the Strategic Command (SC) level, SACT leads in the area of S&T and is responsible for maintaining structured partnerships and coherence between military capability requirements and S&T priorities. SACEUR supports SACT in the area of scientific research and technology development.

The **armaments community** is led by the Conference of National Armaments Directors (CNAD) and is focused on procurement policy and, through the work of the Main Groups (MGs) and the NATO Industrial Advisory Group (NIAG), on technology maturation to deliver military capabilities. In addition, the NATO Support and Procurement Agency (NSPA) serves as NATO's lead organisation for multinational acquisition, support and sustainment in all domains. Under the CNAD, the Defence Against Terrorism Programme of Work (DAT POW) provides funding to experiment innovative operational concepts in defence against terrorism and other asymmetric threats.



The **digital community** under the leadership of the Digital Policy Committee (DPC) promotes the maturation and adoption of digital technologies across the Alliance. Here, the NATO Communications and Information Agency (NCIA) is the central pillar of technology maturation and service provision in the digital domain;

The **defence planning community** is led by the Defence Policy & Planning Committee (DPPC), which oversees the NATO Defence Planning Process (NDPP) that encompasses the planning and delivery of Allies' and NATO's defence capabilities;

The **innovation community** in NATO is centred around the Defence Innovation Accelerator for the North Atlantic (DIANA) and the NATO Investment Fund (NIF), which are established to accelerate dual-use innovation across the Alliance. Overarching innovation policy is provided by the Deputy Permanent Representatives Committee (DPRC).

The **science diplomacy community** builds and strengthens trusted partnerships by promoting dialogue and practical cooperation between NATO member states and partner countries. The Science for Peace and Security (SPS) Programme serves as the primary vehicle for these efforts. Under the oversight of the Political and Cooperative Security Committee (PCSC), the SPS Programme supports tailor-made, practical security-relevant activities through established grant mechanisms that provide funding for multi-year research and development projects and events.

The **NATO Intelligence Enterprise**, through the Military Intelligence Committee (MIC) and the Civilian Intelligence Committee (CIC), provides intelligence assessments on potential adversaries' and strategic competitors' S&T competence and capacity.

This NATO S&T Enterprise is embedded in a **wider ecosystem** of potential National contributors, beneficiaries within the NATO structure, and cooperation partners outside the NATO structure:

- Drawing heavily on the collaboration amongst National subject matter experts, the Enterprise maintains close and fruitful ties with governmental research laboratories as well as academia and industry to keep its knowledge base strong and vibrant. Recognising the dynamism of the start-up scene and the dual-use nature of many emerging technologies, the Enterprise is open to and welcomes contributors from outside the traditional defence sector to expand and enrich its knowledge base.
- In addition to the communities listed above, a number of senior policy committees within the NATO structure receive evidence-based advice mainly from the STO on a broad range of topics such as resilience, climate change, nuclear planning, non-proliferation, human security, and operations.
- Several organisations outside the NATO structure engage actively with the Enterprise, including the NATO Parliamentary Assembly, the NATO-accredited Centres of Excellence, and the von Karman Institute for Fluid Dynamics.
- Given that S&T collaboration occurs in many different international settings, NATO cooperates with other international organisations, such as European Union (EU) and the Organisation for Economic Co-operation and Development (OECD), within extant NATO policies.

Strategic Goals

For the Alliance to outperform its strategic competitors and potential adversaries in inserting scientific knowledge and adopting emerging technologies across all core tasks, the Enterprise supports political decision-makers and military warfighters by developing military capabilities, delivering evidence-based advice, and building trusted partnerships. The Nations are instrumental for a successful implementation of the Strategy, benefitting both, as sovereign Nations and as Allies.

To achieve its vision, and building on its world-class knowledge base and its proven ability to translate scientific excellence and technological prowess into strategic advantages, the Enterprise must pursue three strategic goals.

GOAL 1
Anticipate & Invest

GOAL 2
Safeguard & Protect

GOAL 3
Orchestrate & Energise

GOAL 1

Anticipate & Invest

To prepare the Alliance for the uncertainties of the future, the Enterprise must systematically identify the S&T areas that will likely shape that future and attract, develop and retain experts competent in those areas. In turn, NATO and Nations must equip the Enterprise with effective collaboration tools and ensure appropriate funding. Subordinate objectives include promoting systematic foresight analysis, expanding the knowledge base beyond the traditional defence sector, supporting education programmes in science, technology, engineering, and mathematics (STEM), strengthening science diplomacy, and ensuring comprehensive coverage of all S&T areas relevant to defence and security.

GOAL 2

Safeguard & Protect

As the foundation for the Alliance's continued success, the Enterprise must be shielded against interference from strategic competitors and potential adversaries in order to safeguard our knowledge base and protect our values. Subordinate objectives include protecting experts, venues, and information, developing a comprehensive approach to research security, and promoting NATO's Principles of Responsible Use.

GOAL 3

Orchestrate & Energise

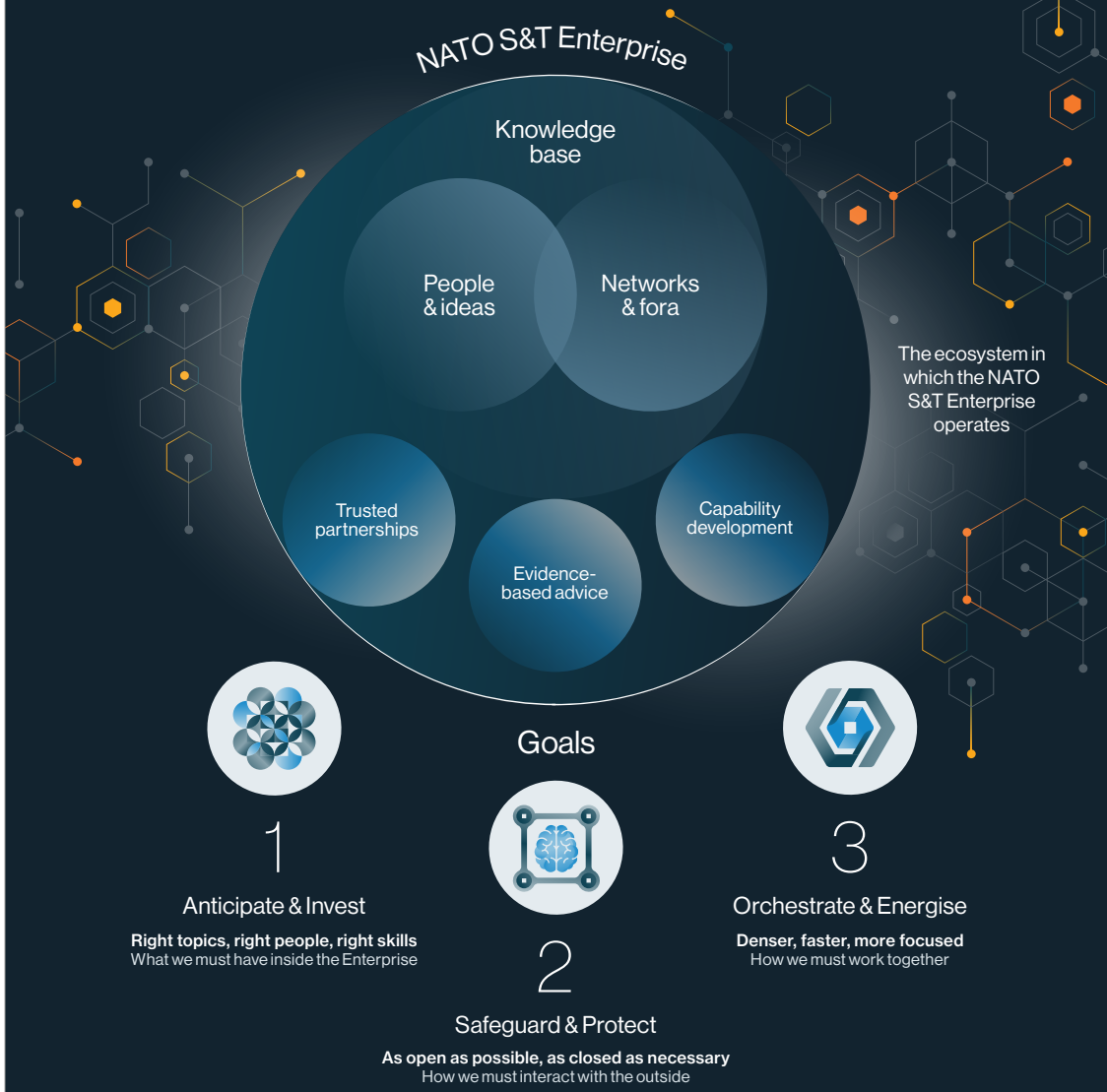
Acknowledging its organizational complexity, which is rooted in the diversity of its members' chartered missions, the Enterprise must strengthen its internal bonds. This includes promoting denser, deeper and more agile coordination, fostering proactive information sharing, advancing shared situational awareness, and improving and accelerating the exploitation of S&T results in the Alliance's Instruments of Power, across all core tasks, as well as in innovation initiatives. Subordinate objectives include strengthening direct collaboration between researchers and warfighters, facilitating experimental validation, promoting technology literacy, and developing joint strategic communication activities.

Vision

Outperform strategic competitors and potential adversaries in rapidly inserting scientific knowledge and adopting emerging technologies

Mission

Maintain a collaborative world-class knowledge base and translate its scientific excellence and technological prowess into decisive advantages for the Alliance's instruments of power



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