2025–2029

Defence Strategy for Industry and Innovation

CONTENTS

Foreword

Increasing threats require strong armed forces to protect the Netherlands and our allies. Strong armed forces need to be underpinned by a strong Defence industry and a highly innovative ability. The large scale Russian war in the Ukraine shows this: it's not only a war between two armed forces, but also between industries and innovative abilities. An important operational success factor is who can produce more, who can adapt and innovate faster, and who can sustain the longest. To deter Russia and other possible adversaries, we must be better at this than them.

Alongside their importance for security, a strong industry, innovative ability and research base, are essential for our economy. They create job opportunities. Innovations in Defence also have spill-overs to civil applications, fostering further economic development. In this way we are creating benefits with the current Defence Strategy for Industry and Innovation for both our security and our economy.

Urgent action is called for. Security threats are increasing rapidly. The United States have called upon us to take more responsibility for our own security. We must scale-up our and innovative ability now. These historic times won't allow for gradual scaling up and growth, but require an impulse and courage to change. This demands action from the armed forces but also from the Netherlands as a whole. And it requires government, business and research institutions to act differently.

The Ministry of Defence will take a leading role in this endeavour by increasing investments in innovation and by scaling up industry. In the five Dutch focus areas (NLD areas), we will strengthen coordination and develop roadmaps, in cooperation with the Dutch business community and research institutions. We will give direction by specifying our ambitions for 2030 and 2040. As a government, we will act as smart developer in these areas, for it is in these areas that we can really make a difference on the world stage. We will change our internal processes to move faster from idea to implementation and scale-up, which is the only way to accelerate innovation. To achieve this, we need our partners: we cannot do it alone and we have to learn, try, fail, try and persevere together until we get there. This includes the Ministry of Defence designing its procurement process in such a way that companies are encouraged as much as possible to scale up production capacity, financiers need to make investments and research institutions need to innovate with us. The Ministry of Defence will maximise international efforts to bring together demand from other countries and position Dutch companies and research partners in international tenders through Industrial Participation. We will involve research institutions, companies and other governments in our demand specifications at an early stage, to ensure that companies and research institutions can deploy their knowledge and expertise and to allow for scaling-up.

We will do this in continuous dialogue in our ecosystems and within the newly launched public-private platform 'Defport'. Together with research institutions and industry, we will innovate, develop scale-up initiatives and remove concrete obstacles. Besides the driving role of the Ministry of Defence, society, industry and research institutions are also expected to take an active role in order to make this possible. This strategy is the starting point: we have to make sure that together we turn words and plans into concrete actions and results. For our safety today and tomorrow.

Introduction & summary

Urgency & goal

The Netherlands is not at war, but is no longer at peace either. After years of peace and safety in Europe, the Netherlands must refocus on protecting and defending its own territory and that of the NATO alliance. The Netherlands and Europe need to take more responsibility for their own security and depend less on others. In addition, recent conflicts such as the Russian war in Ukraine show that both traditional war concepts and new technologies are being used, e.g., both trenches and fibre-optic drones.[1] The international rule of law and democratic values are under pressure. The production capacity of European industry is not scaling up fast enough to meet current demand, which is a major obstacle in strengthening our armed forces. New challenges due to climate change are also widely recognised as security threats. It is therefore essential to anticipate this complex “threat multiplier”.[2] In order to become less dependent and be ready for today’s and tomorrow’s fight, it is essential to better utilise knowledge, shorten innovation cycles and scale-up production capacity of military equipment.[3] The process of moving from idea or new technology to implementation and scale-up needs to be faster. This is the only way to increase our production capacity and ensure real results. This is only possible if research institutions, ministries, companies, financial institutions and armed forces work together and everyone is challenged to work together towards the effects that need to be achieved and problems that need to be solved. This will contribute to our resilience and to a credible deterrence.

This strategy guides the Netherlands’ choices and actions for future-proof armed forces and for an increased European strategic autonomy in security and Defence.

1 Letter to the House of Representatives titled ‘Resilience to military and hybrid threats’, 2024 (Parliamentary paper 30 821, no. 249); annex Assessment of Military and Hybrid Threats, MIVD & AIVD, 2024.
2 NATO Climate Change and Security Action Plan, 2021; A Strategic Compass for Security and Defence. For a European Union that protects its citizen, values and interests and contributes to international peace and security.
3 The future of European competitiveness: Report by Mario Draghi, The European Commission, 2024.

We are building **strong**, **smart** and future-proof armed forces **together** with partners that, with sufficient military equipment and a strong innovative ability, will make the required contribution to NATO and to security within Europe in order to deter, fight and win. The government recognises that the Netherlands and Europe need to take more responsibility for their own security. This is an urgent task, which is why the government is strengthening the Netherlands Defence Technological Industrial Base (NLDTIB), knowledge base and the preconditions that companies and research institutions need to be able to take the right steps. This subsequently allows the Netherlands to make its contribution to strengthening the European Defence Technological Industrial Base (EDTIB). This strategy has been prepared in collaboration with companies and research institutions to provide clarity on choices and direction for the next five years. Because of the rapidly changing geopolitical situation, the operational demands this puts on our armed forces and the speed of technological developments, an annual action agenda with concrete objectives for that year will also be published.

We are not starting over but will build on previous frameworks, choices and actions.[4] The Defence Industry Strategy (DIS, 2018), which is based on an analysis by the Hague Centre for Strategic Studies (HCSS) (2018)[4], sets out why having a technological and industrial base of our own in the Netherlands is important to ensure our security and that of our allies. The validity of that analysis was confirmed in 2022, when, after the

4 2018 Defence Industry Strategy (DIS) (Parliamentary Paper 31125, no. 92); Essential interests and the national defence-related industrial and technological base, HCSS, 2018; 2022 Defence White Paper (Parliamentary Paper 36 124, no. 1); Letter to the House of Representatives on the DIS in a new geopolitical context, 2022 (Parliamentary Paper 31 125, no. 122); 2021-2025 Strategic Knowledge and Innovation Agenda, 2020 (Parliamentary Paper 35 570 X, no. 32); Letter to the House of Representatives on the Innovation and Research Implementation Agenda, 2022 (Parliamentary Paper 31 125, no. 122); Letter to the House of Representatives on the Progress of the Innovation & Research Implementation Agenda, 2024 (Parliamentary Paper 31 125, no. 130); Letter to the House of Representatives on the Action Agenda regarding Security of Production and Supply of Ammunition and Defence Equipment, 2024 (Parliamentary Paper 36 410, no. 93); Defence White Paper 2024 (Parliamentary Paper 36 592, no. 1).

release of the 2022 Defence White Paper, the DIS was reassessed and confirmed in the changed geopolitical context. Moreover, the Maritime Manufacturing Industry Sector Agenda outlined the importance of having a technological and industrial base specifically for the maritime sector.[5] The 2023 Security Strategy for the Kingdom of the Netherlands defines our actions for the coming years to ensure our national security; the implementation of the current strategy will be aligned to this.[6] The 2021-2025 Strategic Knowledge and Innovation Agenda (SKIA) and the 2022 Defence White Paper have shifted the focus to strengthening and growth, following years of cutbacks in research and innovation policy. The 2022 and 2024 Letters to the House of Representatives on research, innovation and production security brought more focus to this policy by making choices, focusing on Dutch opportunities and emphasising the importance of cooperation, both nationally and internationally. The most recent 2024 Defence White Paper has strengthened the policy direction: the Ministry of Defence needs to strengthen, make smart choices and collaborate. The same is required for the research, innovation and industry domain to win the battle of today and tomorrow and strengthen the Dutch knowledge and industrial base. We need to strengthen, make smart choices and accelerate in order for the Netherlands to develop, produce and actually deliver in key positions for our armed forces and the armed forces of our allies. That means learning from each other and from what is happening around us and in the field, ensuring continuous development and allowing ourselves to fail intelligently.

Strong, smart, together

Strong

A strong armed forces needs sufficient and high-quality equipment[7], personnel and services. Our Needs are determined by analyses of our potential future deployments, are concretely agreed upon in a NATO context and arise from operational and other challenges that demand a solution. The set of needs forms the *capability pull* towards industry and research partners. What the Dutch armed forces need, we should preferably procure within the Netherlands, from our own research and industry base, and otherwise within Europe. To strengthen that base using the *capability pull* as a guideline, the Ministries of Defence and Economic Affairs are working on:

- **A strong Defence base in ten areas**, across the scope of research, experimentation and industry (scale-up).
- **Strengthening and broadening the knowledge base**: the Ministry of Defence is strengthening its knowledge base that enables us to take up different roles, from smart developer to smart buyer and smart policy-maker, for example. As new technologies and concepts with both civil and military applications are rapidly developing, the Ministry of Defence is committed to strengthening our knowledge base and forming new collaborations with civil research institutions.[8]
- **Strengthening the NLDTIB**: to ensure strong armed forces and in order for the Netherlands to have a place in international supply chains, the NLDTIB needs to be scaled up. This entails scaling up successful innovations into production, as well as scaling up current production facilities. The Ministry of Defence is actively working with industry and research institutions on this by setting up concrete projects and through Defport. The 2024 Defence White Paper has specifically allocated budget to facilitate scaling up innovation and production.
- **Industry-enhancing procurement**: the Ministry of Defence is strengthening the NLDTIB in part by placing more orders with Dutch and European parties. The Ministry of Defence is adjusting its procurement policy by also taking into account where a product is from and how quickly it can be delivered. In line with the 'Letter to the House of Representatives on reducing the administrative burden and speeding up the procurement process', the Ministry of Defence is making more and quicker use of exception provisions where possible and where necessary.[9] If the Ministry of Defence does acquire the equipment elsewhere, for example because we do not have the relevant industry in-house ourselves, the Ministries of Defence and Economic Affairs will, through **Industrial Participation**,

5 Letter to the House of Representatives presenting the Maritime Manufacturing Industry Sector Agenda, 2023 (Parliamentary Paper 31 409, no. 423); No guts, no Dutch Glory! – Maritime Manufacturing Industry Sector Agenda, 2023.
6 Security Strategy for the Kingdom of the Netherlands, 2023 (Parliamentary Paper 30 821, no. 178).
7 Where this strategy mentions equipment, it broadly includes hardware, software and IT.
8 Government's response to the advisory report of the Advisory Council for Science, Technology and Innovation (AWTI) titled 'Kennisoffensief voor Defensie' (Knowledge Offensive for the Ministry of Defence), 2025 (Parliamentary Paper 36 592, no. 12).
9 Letter to the House of Representatives on reducing the administrative burden and speeding up the procurement process, 2024 (Parliamentary Paper 36 600 no. 6).

make a case for the involvement of Dutch companies and research institutes in the development, production and maintenance of Defence equipment.

- **Mitigating high-risk strategic dependencies**: it is necessary to have sufficient raw materials and semi-finished products and to be able to protect the NLDTIB if necessary, so as to ensure that unique Dutch knowledge and technology do not fall in the hands of potential adversaries. The government is monitoring supply chains and is making them sustainable, and is committed to innovation and circularity.[10] In addition, the government is taking various protect and promote measures to ensure that the Netherlands is and remains a leader in strategic technologies and knowledge, as described, for example, in the National Technology Strategy (NTS).[11]

- **Financing the Defence industry**: companies producing military equipment or civilian equipment with military applications are experiencing bottlenecks in access to finance.[12] Private funding does not materialise sufficiently due to special characteristics of the Defence industry. The Ministry of Defence, in cooperation with the Ministry of Economic Affairs, has therefore drawn up a **Defence Industry Financing Action Plan**. This plan aims to improve access to private funding for the Defence industry and, where this leads to bottlenecks, to supplement it with public or public-private funding in a targeted way.

Smart

The smart choices to be made by a country like the Netherlands, as an ally and a medium-sized European country, are based on where the *capability pull* and *push* come together. The *capability pull* is formed by operational needs, the *push* by today's and tomorrow's societal, technological and industrial developments. In the Netherlands, both needs and developments converge in five technology areas we excel in: Quantum, Smart Materials, Space, Intelligent Systems and Sensors.[13] These areas stem from the broad base, but because of our unique knowledge and industry position, the Netherlands is able act as smart developer in these fields. Besides these five Dutch focus areas, the Netherlands traditionally excels in the maritime industry, on which we will continue to focus.

In Ukraine, we can see how fast technological developments are going, what impact they have on warfare and how we need to respond as a government. This has taught us that the Netherlands needs to act smarter not only in *what* we do, but also in *how* we do this. What will be prioritised:

- **Additional investments in the 5 NLD areas**: across the process of knowledge building, technology development, experimentation, ecosystem building and scaling-up, we are investing in the 5 NLD areas and in the maritime industry, seeking to link up with the NTS in order to advance key technologies in the Netherlands.

- **Creating a smarter Defence organisation** that can innovate faster through a connected process. Ideas are born in people: a promising concept or new technology needs to be fostered, tested in an operational setting earlier, we need quicker feedback on what we have learned from this in order to make adjustments and, in case of success, we need to be able to purchase and scale-up faster and implement on a large scale. This means taking account, not only of the technological aspects of innovation, but also of the human and organisational preconditions: what does it take to move something forward in each step of this process? Additionally, financial flexibility within the Ministry of Defence's is an important preconditions.

10 Letter to the House of Representatives on Progress regarding the National Raw Materials Strategy, 2023 (Parliamentary Paper 32 852 no. 291); Letter to the House of Representatives on the 2023-2030 National Circular Economy Programme (NPCE) including the government's response to the Integrated Circular Economy Report (ICER) and the exploration by the Social and Economic Council of the Netherlands, 2023 (Parliamentary Paper 32 852 no. 225).

11 National Technology Strategy (NTS), 2024 (Parliamentary Paper 33 4009, no. 140).

12 Letter to the House of Representatives on funding bottlenecks in the defence industry, solutions and action lines, 2025 (Parliamentary Paper 31 125, no. 133).

13 2022 Defence White Paper (Parliamentary Paper 36 124, no. 1); Letter to the House of Representatives on the Action Agenda regarding Security of Production and Supply of Ammunition and Defence Equipment, 2024 (Parliamentary Paper 36 410, no. 93); Letter to the House of Representatives on the Progress of the Innovation & Research Implementation Agenda, 2024 (Parliamentary Paper 31 125, no. 130).

Together

The Netherlands and the Ministries of Defence and Economic Affairs cannot achieve all that needs to be done, alone. The Netherlands is a medium-sized country in the European Union with a small but knowledge-intensive and highly skilled NLDTIB. A lot of equipment and services need to be procured through partners. In addition, a vital NLDTIB requires exports, the needs of the Dutch armed forces alone are not sufficient as a market. The NATO is working on interoperability and standardisation and the EU is working on scaling-up the European defence industry through active European industrial policy and funding and through encouraging joint procurement and joint R&D. Within the Netherlands, there is intensified cooperation with research institutions, industry, other ministries and regions. Based on their own role, each partner contributes to future-proofing the armed forces within NATO. This intensified cooperation is shaped within and outside of the Netherlands by:

- **Setting up Defport**: Defport is a public-private partnership instrument that helps implement this strategy and create the right preconditions for success. Within Defport, the Ministry of Defence, the Ministry of Economic Affairs, the Netherlands Industries for Defence and Security (NIDV), the Confederation of Netherlands Industry and Employers (VNO-NCW), the Association of Mechanical and Electrical Engineering (FME) and research institutes and the financial sector work together to bridge the gap between supply and demand, so that the Defence market becomes more attractive for companies and research institutes and companies to become or remain active in, or to invest in.

- **Strengthening cooperation within the government:** the Ministries of Defence, Economic Affairs and Education, Culture and Science Will cooperate more intensively on the five NLD areas. Every euro can only be spent once: we are looking for multipliers from different government sources.

- **Cooperating at a regional level** and **deploying joint testing facilities**: every region counts, which is why ecosystems are being built by research institutions, industry and government at specific locations in the regions, where joint work is done on knowledge building, testing, innovation (and scale-up of innovation) and production. Civil research partners ranging from schools for senior secondary vocational education, universities, universities of applied sciences and think tanks will be involved.

- Increasing the **international focus on pooled demand**, **regional technological cooperation**, **coproduction** and **standardisation** in a proactive way. This is done bilaterally, between groups of countries, and in the NATO and EU contexts.

- Intensifying cooperation with the **Ukrainian Defence industry**.

Strong

- Strengthening NLDTIB
- Strengthening & broadening the knowledge landscape
- Industry and innovation-enhancing procurement policy
- Protecting strengths
- Defence industry financing action plan

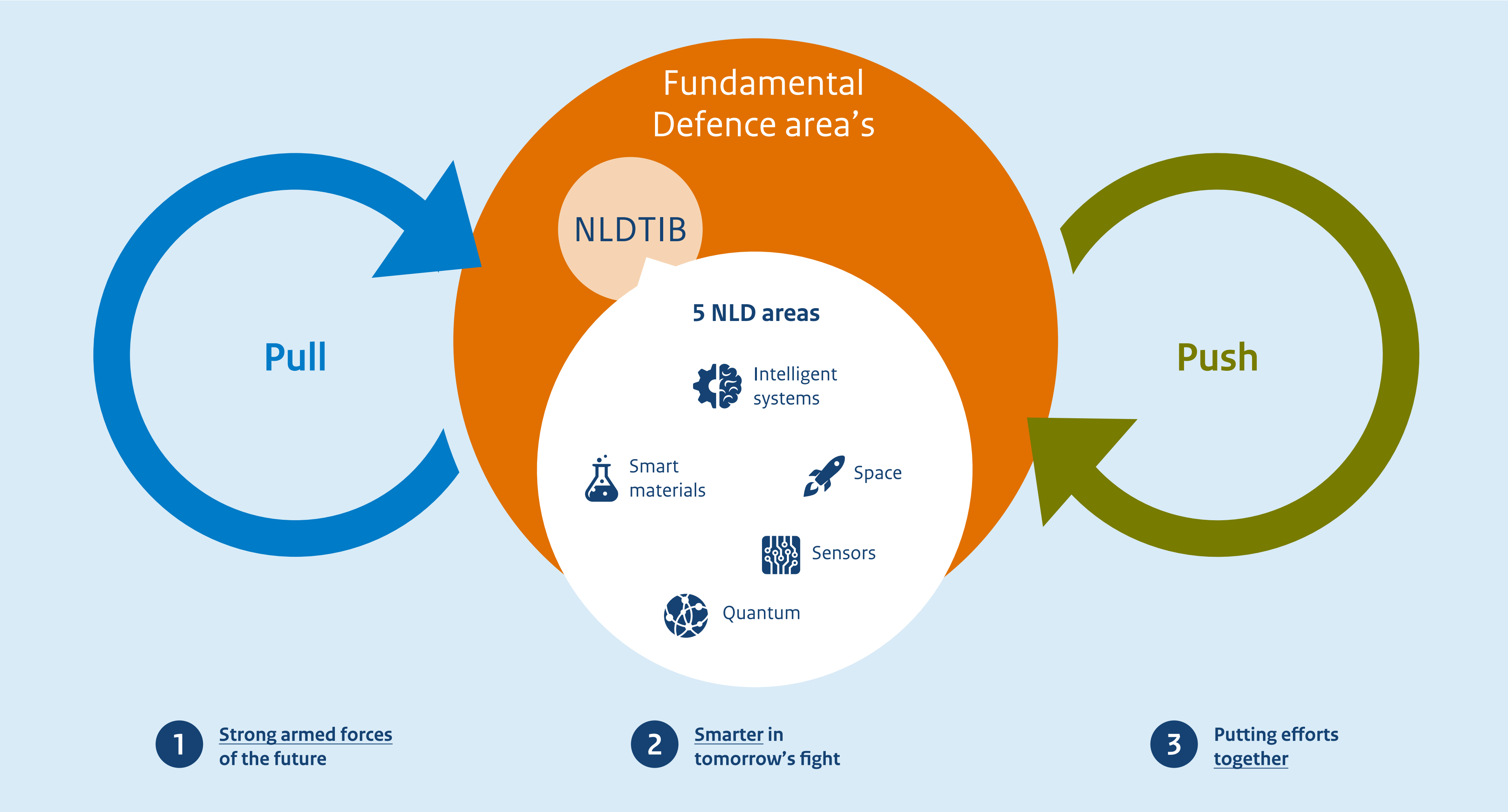
Smart

- Increased focus: additional investments in 5 Dutch focus areas
- Setting up a smart organisation
- Strengthening the connection between knowledge, innovation and upscaling.

Together

- Setting up Defport and NLD_regions programme office
- Strengthening interministerial cooperation
- Increased access to testing facilities and military support
- Increasing the international focus on pooled demand, regional technological cooperation, coproduction and standardisation in EU and NATO contexts
- Intensifying cooperation with the Ukrainian Defence industry

Figure 1. **Strategic Agenda - Defensie Strategy for Industry and Innovation (D-SII)**



01

STRONG ARMED FORCE AND NLDTIB

Strong armed force need high-quality and sufficient equipment, personnel and services. The Ministry of Defence is in need of combat capabilities, including combat support and operational support. The Netherlands needs those capabilities in order to defend its territory and to do its part in defending NATO territory. Specifically, the Netherlands is investing in additional maritime capabilities, space capabilities, cyber technology, fighter aircraft, tanks and helicopters, among other things.[14] In addition, strong material and logistical support, investment in (concept) development such as multi-domain operations, in personnel as key connectors and in solutions to energy dependency are essential for effective armed forces. Additionally, a digital transformation, aimed at strengthening operational capabilities, is crucial for the modernisation of the armed forces.[15] As a whole, these needs define the capability pull towards the NLDTIB and knowledge base.

Having our own NLDTIB and knowledge base are prerequisites for providing security for the Netherlands and its allies. On the one hand, operational deployability, sustainability and scalability of the armed forces, require us to be able to fall back on a solid base. On the other hand, the Netherlands is also expected to make a concrete (industrial) contribution within Europe and NATO when it comes to scaling-up and strategic autonomy. Only in this way will we make each other stronger within the alliance. It is important, however, that we make choices and make smart investments in our NLDTIB.

To make those choices, we first analysed the constitutional duties and international agreements that the Netherlands must fulfil. That analysis was made earlier and remains unchanged, and thus still stands. Subsequently, based on the threat assessment and the technological and industrial base of the Netherlands, a consideration was made as to the technological and industrial base that the Netherlands should have at its disposal.[16] While the base is broadly similar, the current geopolitical context places even more demands on the base that the Netherlands and Europe must have at their disposal. It in certain facets also requires a *different* base than previously provided for because of the way wars are now being fought. Production of equipment at locations close to conflict zones, for example, is no longer a foregone conclusion. This means that we have to retain or develop certain capabilities in the Netherlands in order to produce, scale up and support the (crucial) weapon systems of the armed forces and its allies. This may therefore mean investing in national capabilities for specific weapon systems in order to mitigate high-risk strategic dependencies. These capabilities include development, training & education, production, logistics and maintenance of Defence equipment.[17]

Netherlands Technological and Industrial Base

The Netherlands has a strong and knowledge-intensive technological and industrial base providing high-quality products and services. This base makes us less dependent on others and allows us to respond to new opportunities and risks that arise. The changed geopolitical context and rapid technological developments to a major

14 2022 Defence White Paper (Parliamentary Paper 36 124, no. 1); 2024 Defence White Paper (Parliamentary Paper 36 592, no. 1).

15 A Defence Digital Transformation Strategy will be shared with the House of Representatives in 2025.

16 2018 Defence Industry Strategy (DIS) (Parliamentary Paper 31125, no. 92); Essential interests and the national defence-related industrial and technological base, HCSS 2018; Letter to the House of Representatives on the DIS in a new geopolitical context, 2022 (Parliamentary Paper 31 125, no. 122). The government previously explained in the Defence Industry Strategy (2018; DIS), based on analysis by HCSS (2018), why having its own technological and industrial base is important to provide for the security of the Netherlands and its allies. The validity of that analysis was reaffirmed in 2022, when the government reassessed the DIS in a changed geopolitical context. Moreover, the Maritime Manufacturing Industry Sector Agenda outlined the importance of having a technological and industrial base of its own, specifically for the maritime sector (Parliamentary Paper 31 409, no. 423).

17 The changing context means that there is a different desired independence compared to previous strategies, especially the 2018 Defence Industry Strategy (DIS). That is why the Ministries of Defence and Economic Affairs will publish an updated analysis defining the desired independence in more detail in Q2 2025. Because of the unchanged constitutional duties and international responsibilities of the Netherlands, the analysis from the DIS (2018) remains in full force until these desired independencies are published.

extent determine what this technological and industrial base can offer, both in the Netherlands and in Europe.[18]

It is therefore necessary for the NLDTIB to scale up. Scaling up is required throughout the knowledge, innovation, and industry process: successful innovations should lead to actual production (facilities). And current production facilities also need to scale up to higher-volume production, both in the Netherlands and in Europe. It is also important for the NLDTIB to position itself in international supply chains. This demands action from both the government, for instance by placing orders with the NLDTIB, and from research institutions and the industry sector. For they, too, need to make additional investments in this process of scaling up. The broad industry and knowledge base required by strong armed forces is described below, followed by a description of the specific actions to be taken by the Ministries of Defence and Economic Affairs to enable scaling up, for example through industry-enhancing and innovation-enhancing procurement and the Defence Industry Financing Action Plan.

The Netherlands Defence Technological and Industrial Base (NLDTIB)[1] consists of large, medium-sized and small companies, research institutions and start-ups and scale-ups. More than 1,000 companies operate in the Dutch Defence and security sector. The total Defence-related and security-related turnover of NLDTIB companies has risen sharply: from € 4.7 billion in 2021 to € 7.7 billion in 2023, an increase of 62%. The share of Defence-related and security-related turnover in the total turnover of companies also increased: on average, 15% of the turnover of these companies relates to Defence and security, compared to 10% in 2021, meaning that these companies started doing relatively more business with the Ministry of Defence. The sector is innovative (on average, 11% of turnover is invested in research and development) and highly export-oriented (around 43% of turnover comes from exports, especially to Western Europe and the United States). (Source: Berenschot, *Nederlandse defensie- en veiligheid gerelateerde technologische industriële basis*, 2024).

18 The future of European competitiveness: Report by Mario Draghi, The European Commission, 2024.

Strong Defence Base: protecting and strengthening

To timely anticipate changes in our security environment, it is essential that the Ministry of Defence has a solid NLDTIB and knowledge base. As explained earlier, a strong base is required in order to ensure the operational deployability, sustainability and scalability of the armed forces. Based on critically needed capabilities (*pull*), national and international analyses of key and emerging & disruptive technologies, the Ministries of Defence and Economic Affairs have defined ten fundementalareas that form our base.[19] This base allows the Ministry of Defence, together with other ministries, industry partners and research institutions, to respond and become a key player in value chains (*push*). The base enables the Ministry of Defence to (continue to) develop or procure the best and appropriate equipment, services and concepts.

Fundamental Defence areas

1. Cyber and electronic warfare
2. Sensor systems
3. Weapon systems
4. Platform systems
5. C3I (Command, Control, Communications & Intelligence) & Digitalization
6. Protection
7. Human Performance and Medicine
8. Autonomous and uncrewed systems
9. Logistics
10. Defence-applicable key enabling technologies and methodologies

For the required strong and future-proof armed forces, the Ministries of Defence and Economic Affairs, together with other ministries, fulfil different roles depending on the goal and stage of the process. We distinguish nine different roles, explained in the

19 This list was created on the basis of critical capabilities needed for the Netherlands, the Defence-specific knowledge base, international analyses of emerging & disruptive technologies and national lists of priority and emerging technologies and trends, including the National Technology Strategy (NTS). Explanations for each area and list of sub-areas can be found in Annex 2.

table below. The roles played by the government vary not only by ministry but also by fundamental Defence area.

For instance, when it comes to specific technologies within the ten fundamental areas, the government acts as a 'smart developer', as the civil market cannot do it alone. Within this framework, knowledge is acquired, technology is built nationally, experiments are conducted early within the organisation and opportunities for actual scale-up in the Netherlands are sought together with industry. Yet, when it comes to other technologies, the Ministry of Defence is positioning itself differently, namely as a 'smart buyer': knowledge of these technologies is built in order to make the right procurement and specification choices, as it is not opportune for the Netherlands to start developing these products itself.

Defining the government's role gives clarity to internal and external partners and is important for making smart choices. The choice for a particular role depends on the government's goals, the stage a concept or technology is in, what the national and international market looks like, but also the desired independence the Netherlands wants to have. Therefore, the Ministries of Defence and Economic Affairs will indicate the role the Dutch government wants to play for each fundamental area when updating the desired independencies as announced above.[20]

Knowledge landscape: strengthening and broadening

If the Netherlands wants to be one step ahead of its opponents and scale up efficiently, close collaboration with research institutions is essential. The Ministry of Defence must in this connection mobilise the Dutch research landscape and strengthen knowledge building and application in the ten fundamental areas.[21]

Without the combination of knowledge building and knowledge use, the government cannot act smartly (see the 'smart' roles).

The interaction between civilian and military technological and other developments, concepts and applications is increasing at lightning speed. Civilian technologies such as Artificial Intelligence and quantum can also be used by adversaries within the context of hybrid threats, such as in generating disinformation or in cyber-attacks, and play a crucial role in the global race.[22] That is why the Ministry of Defence will also create knowledge in less military-specific technology, such as semiconductor technology. Civilian research institutions can become increasingly important for the Ministry of Defence in this connection. Again, society as a whole is needed for the country to be resilient against all kinds of threats. The knowledge base is strengthened and broadened by:

- **The Netherlands Organization for Applied Scientific Research (TNO), the National Aerospace Laboratory (NLR) and the Netherlands Maritime Research Institute (MARIN)** will remain the Ministry of Defence's strategic cooperation partners and will be more closely involved in accelerating the process from idea to industry- and implementation, no longer based on silo thinking, but participating in knowledge building and knowledge utilisation, experiments and in industry cooperation.
- **Think tanks, universities, universities of applied sciences and schools for senior secondary vocational education** will play a more structural role within the Defence research landscape: the Ministry of Defence will share with them with its knowledge and innovation challenges. Moreover, legal/procurement and other preconditions are created to make those new collaborations easier and to increase their scale.[23]
- **Collaboration with new and traditional knowledge partners**: New links and consortia are being set up between the strategic research partners (TNO, NLR and MARIN) and the Netherlands Defence Academy (NLDA) on the one hand and

20 In Q2 2025, the Ministries of Defence and Economic Affairs will publish an updated analysis of the desired independencies, including, for each fundamental Defence area, a further explanation of the role the government wants to play.
21 AWTI advisory report titled 'Kennisoffensief voor Defensie' (Knowledge Offensive for the Ministry of Defence), 2024.
22 Assessing Future Technologies through a Hybrid Lens, TNO, 2024.
23 Government's response to the AWTI advisory report titled 'Kennisoffensief voor Defensie' (Knowledge Offensive for the Ministry of Defence), 2025 (Parliamentary Paper 36 592, no. 12).

the Ministry of Defence's new civilian research partners on the other. In this way, we will maximise the potential of the rich Dutch research landscape and create new forms of cooperation; new knowledge brokers can also emerge.

- The Ministry of Defence, in collaboration with the Ministry of Education, Culture and Science, will **programme part** of its **research needs** through the Dutch Research Council (**NWO**).

- The role of the **NLDA**, as a trainer of Defence personnel and positioned within the organisation, is changing. There will be more room for structural (application-oriented) research by the NLDA. They will also be more closely involved in new consortia and contribute to connecting the Ministry of Defence with civilian research institutions.

- An intensification of the Ministry of Defence's research and innovation activities also means **increased absorption** by the organisation. Bringing research and innovation partners into the whole process of knowledge building, experimentation and implementation will contribute to faster transfer of knowledge. Working with scientists on the job, strengthening research, innovation and expertise centres and making acquired knowledge more accessible are examples of possible solutions to realise this.

- The knowledge base as a whole becomes stronger when both substantive and prerequisite **expertise is bundled and strengthened**. To avoid unnecessary competition and ensure that research partners (can) work together in consortia, the right to play should be discussed among them: which partner possesses which niche knowledge and how can parties work together in consortia? A balance must be struck between protecting and promoting in this connection. The Ministry of Defence is tackling this task together with other ministries and with strategic research partners.

- Change means trial and error, intelligent failure, **learning** and further development. This also applies to the new cooperation with research partners: we must dare to pioneer, otherwise the organisation and our environment will not change fast enough.

Smart Policy maker
The Ministry of Defence develops high quality policies by using scientific methods and insights, thereby creating evidence-informed policies as much as possible.

Smart Developer
The Ministry of Defence, research institutions and companies actively participate in the development of technologies and products to help determine direction and timing.

Smart Specifier
The Ministry of Defence supports the relevant industry in setting technical and other specifications in a development process, leaving the actual development of the product to theindustry.

Smart Integrator
The Ministry of Defence takes responsibility for system integration or assembly of components supplied by industry, ensuring secure data exchange and interoperability.

Smart Buyer
The Ministry of Defence is able to set the right functional specifications in the technology and equipment acquisition process and leaves the development of the product to industry.

Financier
The Ministries of Defence and Economic Affairs are committed to identifying and mitigating bottlenecks that negatively affect the Defence industry's funding position.

Smart User
The Ministry of Defence, as the end user, is actively involved in testing and evaluating new equipment and products. This helps validate products in an operational context and provides valuable feedback for further development.

Smart Maintainer
The Ministry of Defence, together with industry, is responsible for maintaining equipment, using innovative methods and technologies to make maintenance cost-effective.

Smart Protector
The Ministries of Defence and Economic Affairs take protective measures to reduce high-risk strategic dependencies. Combined with other Protect measures, this helps prevent high-value knowledge and technology from falling into the wrong hands and the Netherlands from becoming dependent on states that pose a threat to Dutch interests for the supply of strategic raw materials and goods.

MAKE

BUY

Smart policy maker
Research and knowledge that follows is needed to make qualitative policies and ensure a longer-term view on complex issues.[24] The Ministry of Defence therefore also aims to strengthen its role as a smart policy maker and develop evidence-informed policies. The following possible solutions for this have been identified at an interministerial level: 1_Strengthening structures; 2_Focus on strengthening expertise; 3_Working on the future together; 4_Scientific function in the policy cycle; 5_Change does not happen by itself; we effect it together. See Annex 6 for a further explanation and the Defence-specific targets in respect of these tasks.

Strategic Defence Innovation Research (SDIR): SDIR provides a flexible and accessible framework for projects where it is not yet clear at the start which innovation-based approach is most appropriate and whether, after experimentation, we actually want to proceed to scale-up. By integrating the phasing of experimentation and scale-up into a single approach, SDIR provides scope for procurement to engage with the project and market players at an early stage. By using SDIR, the Ministry of Defence supports SMEs and young companies such as start-ups and scale-ups with the development of new technologies. (See Annex 3 for more information).

Industry and innovation-enhancing procurement policy

Orders are needed to enable industry scale-up. Therefore, the Ministry of Defence will more often place orders with Dutch and European parties. The Ministry of Defence will to this end adjust its procurement policy. We will share our operational needs sooner and engage with potential Dutch and European suppliers at a much earlier stage. Needs are shared by developing roadmaps with partners and the revamped procurement processes (see the box on SDIR). Factors that will come to weigh more heavily include where the product comes from and how quickly they can be delivered, as this directly contributes to increasing strategic autonomy and is thus in the interest of national security. In line with the 'Letter to the House of Representatives on reducing the administrative burden and speeding up the procurement process', the Ministry of Defence is making more and quicker use of exception provisions where possible and where necessary.[25]

Industry-enhancing procurement will be used as a basic principle. We will proactively inform the House of Representatives about this in the Defence Equipment Selection Process (DESP) as well, as part of the acquisition strategy for the project in question.[26] If the Ministry of Defence does acquire the equipment elsewhere, for example because we do not have the relevant industry in-house ourselves, the Ministries of Defence and Economic Affairs will, through **Industrial Participation**, make a case for the involvement of Dutch Defence companies and research institutes in the development, production and maintenance of Defence equipment.

The Ministry of Defence also adopts a phased, **innovation-based procurement approach** that minimises risks, rewards the market at an early stage and accelerates innovation.[27] Crucial in this approach are strategic go/no-go moments, in which we decide in consultation with stakeholders whether to continue to the prototyping phase or scale up immediately. Based on these decision moments, we choose the most appropriate procedure, working efficiently and purposefully towards impactful innovations. Annex 3 discusses Strategic Defence Innovation Research in more detail (see box). The Ministries of Defence and Economic Affairs will also work more closely on innovation-oriented procurement in the five Dutch focus areas (NLD areas), for example through joint calls. As a result, we will optimise cooperation between the Ministry of Defence and industry in innovation processes, and ensure implementation of successful innovations.

24 ABDTOPConsult's report titled 'Kennisrijk samenwerken: Verkenning Rijksbrede kennisfunctie', 2023; the Netherlands Scientific Council for Government Policy (WRR) Discussion Paper 'Deskundige overheid', 2024.
25 Letter to the House of Representatives on reducing the administrative burden and speeding up the procurement process, 2024 (Parliamentary Paper 36 600 no. 6).
26 It is already possible to cluster different phases of the DESP in a letter, for example in an A letter or D letter.
27 Letter to the House of Representatives on the Progress of the Innovation & Research Implementation Agenda, 2024 (Parliamentary Paper 31 125, no. 130).

Protecting strengths

The dependence on other, non-partner countries for energy, raw materials and semi-finished products, and the threat of espionage in the Netherlands, not only weakens economic earning power, but also undermines the strength of our armed forces.[28] Our focus is therefore on reducing and preventing high-risk strategic dependencies, protecting vital processes and preventing unwanted transfer of knowledge and technology.[29]

This is done by:

- Implementation of the **National Raw Materials Strategy**.[30] By way of a standardised approach - the roadmap processes - vulnerabilities in the value chain are identified for the focus sectors defined by this government and addressed through action perspectives. The focus sectors are: energy and digital transitions, air and space, defence and healthcare. To increase the power of the Ministry of Defence to act, it is important that the Netherlands becomes less dependent on outside parties for each of these focus sectors. For instance, the Ministry of Defence is making additional investments in energy security and energy independence for operational units and sites of the Ministry of Defence.[31]

- Getting to work on **high-risk strategic dependencies**: a pilot roadmap process for the Defence sector will be launched, focusing on military vessels as a first product group; if successful, this will be extended to more product groups. The recommendations from Defence raw materials studies will be implemented in procurement policy and strategy.[32]

- **Clarifying vulnerabilities** and reducing high-risk strategic dependencies by investing in the research and industry base, such as in the semiconductor sector. The stronger Europe and the Netherlands are, the less dependence there will be.

- By making **targeted investments in the five Dutch focus areas** and seeking synergy with the **NTS**, the Netherlands is choosing technologies for which it can secure unique leadership positions. If Dutch companies succeed in strengthening their position in international value chains, the Netherlands will not become too dependent on other countries in the future.

- **Protecting** the **NLDTIB** through investment tests and the ES Protection Facility.[33]

- In addition to investing in broadening the research landscape and the innovative capacity of the armed forces, an important precondition is that sensitive knowledge and technology from Dutch research institutions, among others, does not end up in the hands of adversaries. Research institutions are actively working on this under the direction of the Ministry of Education, Culture and Science within the National Approach to **Research Security**. Moreover, the broadening of the research landscape makes it increasingly urgent for the Ministry of Defence to protect the specific knowledge and technology developed in direct cooperation between the Defence organisation and research institutions. The Ministry of Defence is actively contributing to knowledge development in this regard, following - to the extent possible - the National Approach to Research Security in order to avoid unwanted knowledge transfer.[34]

- The **Defence and Security-Related Industry** (**Resilience**) **Act** is expected to be sent to the House of Representatives by the end of 2025. This act contributes to strengthening and protecting the NLDTIB and giving it an international position. The act introduces a market regulation instrument, a sectoral safety test and a certificate of suitability.[35]

28 Threat Assessment of State Actors 2, rapport by the AIVD, MIVD and NCTV, 2022.
29 Letter to the House of Representatives on the progress on the government's approach to high-risk strategic dependencies, 2024, (Parliamentary Paper 30 821 no. 244).
30 Letter to the House of Representatives on the National Raw Materials Strategy, 2023 (Parliamentary Paper 32 852 no. 291).
31 2024 Defence White Paper (Parliamentary Paper 36 592, no. 1).
32 Letter to the House of Representatives on the Defence Industry – Critical raw materials and high-risk dependencies in supply chains, 2025 (Parliamentary Paper 32 852 no. 326).
33 Letter to the House of Representatives elaborating the Economic Security Protection Facility and overview of Economic Security instruments, 2023 (Parliamentary Paper 30 821 no. 199).
34 Letter to the House of Representatives discussing the progress on the approach to research security in higher education and science, 2024, (Parliamentary Paper 31 288 no. 1108).
35 The Ministries of Defence and Economic Affairs adopt an NLDTIB report and strategic supply plan every four years. After that, in consultation with the Dutch industry or by means of a market consultation, the parties will explore whether they can perform the relevant contracts on market terms. Ultimately, the act will allow the government to designate parties and entrust them with a service of general economic interest (to implement part of the NLDTIB report) or with supply (to implement part of the strategic supply plan).

- Further convergence of **arms export policies** in Europe. The government is committed to creating a level playing field, increasing the predictability of export opportunities in European cooperation projects, reducing administrative burdens and ensuring quicker supply of components, making the Dutch Defence industry a **more attractive partner** for companies from other European countries. The government is also fully committed to joining the trilateral treaty between Spain, France and Germany, which benefits export control cooperation. At the same time, the Netherlands remains committed to its international obligations regarding arms export controls and, by way of convergence of arms export policies in Europe, the government wants to ensure that member states apply the same high standards.

Financing the Defence industry:

In order for the NLDTIB to be strengthened, companies must have adequate access to funds. The Defence industry is no ordinary industry. Due its special characteristics, private funding does not materialise to a sufficient degree. To bring about the necessary funding, public and private players must act together to remove bottlenecks. The Ministry of Defence is committed to broadly identifying and mitigating such bottlenecks that negatively affect the Defence industry's funding position. To this end, the Ministry of Defence has commissioned[36] several independent studies, and on the basis of these studies, has drawn up a **Defence Industry Financing Action Plan** together with the Ministry of Economic Affairs (see *Annex* 4). Also, starting from the 2024 Defence White Paper, the Ministry of Defence will make budget available for scaling up and strengthening innovation and the Defence industry, part of which will be made available for public contributions to existing tools or tools that are yet to be developed.

36 Letter to the House of Representatives on funding bottlenecks in the defence industry, solutions and action lines, 2025 (Parliamentary Paper 31 125, no. 133).

02

SMART ARMED FORCES – FOCUS

The NLDTIB and knowledge base in the Netherlands can only be rapidly strengthened if choices are made and investments are focused on those areas that the Netherlands is already good at and has built a foundation and reputation in.

Five Dutch focus areas

The Ministry of Defence has chosen five areas, NLD areas, for additional investments based on the needs of the armed forces (*pull*) and the knowledge, technological and industrial Defence base (*push*). These five areas have been selected from the broader fundamental areas in which the Ministry of Defence can take on the role of smart developer. These areas are essential for today's and tomorrow's armed forces and are areas in which the Netherlands has a leading international value chain position from a research and industry perspective.

Launching customer means that the Dutch government is the first buyer of a new product - and can contribute to successfully bringing new products to the market. The focus is on products that contribute to the protection of essential security interests. Confidence in Dutch products among foreign governments can be increased if it is demonstrated that the Dutch government applies the product in operations. For export purposes, especially in the Defence and security market, such confidence is of great importance. This allows new, innovative products to reach a wider audience faster, subject to export control regulations.

- Smart materials
- Sensors
- Quantum
- Space technology
- Intelligent systems

Explanations, further breakdown and prioritisation by area can be found in *Figure 2*. Ambitions for each focus (sub)area are detailed in *Annex 1*. The links between these 5 Dutch focus areas to broader international and national priorities is detailed in *Annex 2*.

In these five Dutch focus areas, knowledge, innovation and industry link up. The Ministry of Defence, acting together with the Ministries of Economic Affairs and Education, Culture and Science, is developing ecosystems for each NLD area. The Ministry of Defence is building fundamental knowledge in this respect, driving innovation and ensuring that this innovation is scaled up by industry and leads to actual production. The aim is to accelerate and industrialise the existing knowledge base and technological development strength in these areas and to enhance the innovative capability of the armed forces. This focus also helps ensure the NLDTIB's unique position in international supply chains. We also contribute to deterrence by bringing these opportunities to the armed forces faster. Moreover, investing in research and development, for these and broader, within the Defence field creates significant benefits for the productivity of countries.[37]

As smart developer, the government collaborates with research institutions and industry so that we can land innovations in the organisation and in new and existing equipment projects. We scale up successful initiatives as launching customer (see text box for explanation). This makes us complete the process of knowledge, testing, innovation and production faster.

In addition to the 5 Dutch focus areas, the Netherlands traditionally excels in the field of the **maritime industry**. Early cooperation between the Ministry of Defence, the maritime manufacturing industry and research institutes (also known as the Golden Triangle) adequately meets the maritime operational needs of, among others, the Ministry of Defence and strengthens the international position of Dutch industry. In October 2023, the Ministries of Defence and Economic Affairs published the Maritime Manufacturing Industry Sector Agenda, in which the government and industry are working on 5 action lines with a total of 25 measures and 5 frontrunner projects.[38] Since then, work has been ongoing to turn the action lines into concrete actions to make the sector future-proof. The technologies being built within the 5 Dutch focus areas also contribute thereto. The same applies to **cyber**: cyber is a priority and growing domain to which technologies from the various Dutch focus areas are contributing.

37 Research shows that every euro invested in defence innovation yields between € 8.10 and € 9.40; 'The economic returns on defence R&D', RaboResearch, Erken H., Every M., Remmen W., 2025.

38 Letter to the House of Representatives presenting the Maritime Manufacturing Industry Sector Agenda, 2023 (Parliamentary Paper 31 409, no. 423); No guts, no Dutch Glory! – Maritime Manufacturing Industry Sector Agenda, 2023.

To strengthen the five Dutch focus areas, the following measures will be deployed:

- **Setting the course:** The Ministry of Defence will, in 2025, develop a roadmap for each Dutch focus areas and for the maritime sector. It will do so together with the Ministry of Economic Affairs and other ministries, industry and research partners. These roadmaps state the ambitions we have and the effects we want to achieve. *Annex 1* outlines our ambitions for each Dutch focus (sub)area, drawn up together with Dutch industry and research institutions. In developing these ambitions into roadmaps, synergy will be sought as much as possible with the action agendas being developed in parallel under the NTS under the direction of the Ministry of Economic Affairs.[39] The Defence roadmaps are prepared with the expertise of the Ministry of Economic Affairs and others in order for the national opportunities to be given the best possible position.

- Within the Ministry of Defence, **coordination** of the five NLD focus areas will be strengthened in order to establish broadly supported ambitions and roadmaps.

- **Investing & scaling up:** The Ministry of Defence will increase the knowledge base, develop technology, experiment, build ecosystems, facilitate production and place more orders in the five NLD areas. To this end, increased use will be made of calls in which a connection will be made to future investments (e.g. in equipment) and innovative procurement methods will be applied. Increased flexibility in the Ministry of Defence's multi-year budgets is a prerequisite for including innovations that are then scaled up and implemented.

39 National Technology Strategy (NTS), 2024 (Parliamentary Paper 33 4009, no. 140).

Figure 2. **Explanation of each Dutch focus area**

Intelligent systems

The Ministry of Defence wants to be able to act faster, more accurate, safer and smarter in order to stay one step ahead of potential adversaries. Intelligent systems help us to achieve this. From drones that autonomously gather intelligence and AI for cyber operations and cybersecurity, to data-driven systems that support decision-making: technology can enhance human action by deploying it in the right ways.

Sensors

Sensors are the senses of our military operations. They scan the environment, detect risks and opportunities, and ensure soldiers can respond quickly and accurately. Without sensors, our troops would be blind and deaf to potential threats, severely reducing their security and effectiveness. Sensors improve decision-making and provide real-time situational awareness.

Smart materials

Smart materials are those that can respond intelligently to changing conditions in the environment, such as mechanical, thermal or electrical stimuli. The Ministry of Defence invests in composites, additive manufacturing and metamaterials.

Space technology

Space is the fifth military operational domain and is of indispensable strategic, tactical and operational importance for the proper functioning of our armed forces. This in particular concerns the use of satellites, which are essential for navigation, positioning and timing, communications and earth observation, or information-driven operations of our armed forces.

Quantum

Quantum covers a range of emerging technologies, with a wide range of promises and threats: obtaining better intelligence, being able to detect submarines and navigate with millimetre precision in all areas, without GPS. The domain of Quantum is broad and the Ministry of Defence needs to follow a wide spectrum of developments. Quantum technology can lead to new strategies and capabilities in both conflict situations and the processes surrounding them.

Subareas within the Dutch focus area

Intelligent systems:

- Onbemenste systemen
- AI & DataScience

Sensors:

- Sensors, including:
  - Radar, optical, acoustic, EM and cyber
  - Sensor networks
  - Sensor fusion

Smart materials:

- Composites
- Additive manufacturing (3D printing)
- Metamaterials [40]

Space technology:

- Space technology, including:
  - Space Situational Awareness
  - Earth observations including ISR
  - Satellite communications
  - Position, navigation and timing (PNT)

Quantum:

- Quantum, including:
  - Quantum computing
  - Quantum sensing
  - Quantum networking
  - Quantum resilience

40 For this subarea, the ambitions will follow later in 2025.
41 The developments will be implemented partly in conjunction with the Long-Term Space Agenda, see the Government's response to the Long-Term Space Agenda (LTR) (Parliamentary Paper 24 446, no. 90).

Accelerating innovation

Innovation is about finding a solution to a problem and turning ideas or experiences (about our own actions or those of our adversaries) into new technologies and concepts and then experimenting with them. Increasing the innovative capability of the Dutch armed forces not only requires choices to be made, but also accelerating. Greater innovative capability means putting the latest concepts and best equipment in the hands of our war fighters, learning in practice, and large-scale learning to ensure continuous improvement. A different approach to achieve innovation and acceleration means continuous learning and optimisation, which includes intelligent failure. The war in Ukraine shows that lightning-fast innovation cycles are essential to gain supremacy and contribute to credible deterrence. The cycle from knowledge accumulation to acquisition/upscaling and back again needs to be faster. Information from operations must land faster, while new discoveries must be used faster in operations and during exercises. Research institutes and industry can play a greater role in shortening this feedback loop by interpreting developments and making the latest knowledge and technology available for experimentation.

In the past, the Ministry of Defence has had to make substantial cuts, leading to a mindset and organisational culture focused on manageability. In order to achieve faster innovation and thus be one step ahead of our adversaries, not only technological developments must be considered, but the human and organisational aspects of a change must be included at an early stage. The possibility of scaling up in the event of success should also be taken into consideration immediately. To this end, the Ministry of Defence is working on the following priorities:

- **Cooperation in the internal Defence organisation is improved** to ensure that knowledge and ideas result in faster implementation and scaling up. This includes a balanced portfolio with *push* and *pull* and top-down and bottom-up approaches.[42]
- Ideas are created by people. The Ministry of Defence will pay more attention to **social innovation**[43], which is the only way innovation will actually come about. We do this by focusing on four areas of action (flexible mindset, innovative leadership, modernisation of practices and implementation capacity) while continuing to leave room for bottom-up initiatives. An explicit part of this is making bottom-up innovative proposals visible. Attention to learning from each other, from what is happening around us and from new approaches and procedures, with room for intelligent failure, is an explicit part of this.
- *Annex 5* details the **Social Innovation Action Lines** of the Ministry of Defence.
- The **link** between **idea and scaling-up** is established early, innovation is included when new equipment and IT processes are started up. For new research and innovation projects, implementation possibilities and impossibilities are considered at an early stage (DOTLMPLFFII[44] factors and, explicitly, multi-year (investment) plans).[45]
- A successfully developed innovation (or innovation component) must end up in a product, service or concept that is procured and implemented. Especially when it comes to new technologies and concepts, working with an **innovation bandwidth** in multi-year (investment) plans is a possible solution. There must be sufficient financial flexibility within the existing budgets.
- Information and equipment from operational practice will need to be incorporated into the organisation more quickly as **lessons learned**. Digitisation, classification, connections, logistics and best practices play a crucial role in this connection.
- **Experimenting** with new applications of knowledge and innovation will become part of operational **readiness**. This will allow innovations to reach users more quickly, and speeds up feedback from users to Research centres and industry.

42 Government's response to the advisory report of the Advisory Council for Science, Technology and Innovation (AWTI) titled 'Kennisoffensief voor Defensie' (Knowledge Offensive for the Ministry of Defence), 2025 (Parliamentary Paper 36 592, no. 12).

43 National Centre for Social Innovation (NCSI) - Social innovation is an innovation in work organisation and labour relations that leads to improved organisational performance and talent development.

44 Doctrine, Education, Training, Leadership, Resources, Personnel, Legality, Finance, Facilities, Information, Interoperability; TNO, 2022.

45 Preconditions such as smart systems for energy supply and security of supply, sustainability, circularity and real estate, are explicitly included.

Socially responsible innovation
The Ministry of Defence must be accountable to and have the support of Dutch society in the performance of its main tasks. This also applies to research, innovation, experimentation, and industry activities. We have to comply with laws and regulations as well as norms and values. An example is taking legal and ethical frameworks into account at an early stage of development.

Socially responsible innovation can be briefly defined as identifying social aspects of innovations at an early stage so that they can be taken into account already in the design process of the innovation. It can be applied through a threefold broadening of the innovation process: the 'what' (broad societal analysis), the 'who' (involving various stakeholders), and the 'how' (iterative testing and evaluation) should be included.

The Ministry of Defence is participating in a research project of the Dutch Research Council on socially responsible innovation. Another example of Dutch commitment to this is the Dutch role as initiator of Responsible Use of AI in the Military Domain (REAIM) conference.

03 COOPERATING ARMED FORCES

To realise future-proof armed forces, it is necessary to create capabilities for the Ministry of Defence in faster through closer cooperation between ministries, companies, research institutions and regional partners within the Netherlands. This will enable the rapid development and application of knowledge and technologies and the scaling-up of the NLDTIB. With today's hybrid threats and speed of change in the geopolitical context and warfare, (civilian) research institutions and industry have taken on a more important role when it comes to our peace and security. This requires a bolstered and different way of cooperation: national and international. Together, we will align content and focus (*what*) and shape the ways in which we set up the changed playing field and achieve new results (*how*). Cooperation is intensified across the board, from knowledge building and technology development to innovation. This, as well as the requirement and procurement process and industry, give rise to new financial and other scale-up and production issues. These issues can be jointly discussed and resolved through Defport.

National

National cooperation with other ministries, research partners and industry in the Netherlands leads to better results for both the armed forces and Dutch society. Together, we will build on ecosystems that are already in place in order to the maximise their potential.

Cooperation is structured through different ecosystems, by topic (e.g. NLD focus area) and by region. Each partner has its own role to play. The Ministry of Defence presents its needs to industry - the capability *pull*. Research institutions, start-ups, SMEs and Original Equipment Manufacturers (OEMs) are working together on solutions required by the Ministry of Defence. Depending on how advanced the technology/solution/service is, the leading role in this ecosystem will differ. It may be an OEM performing an integration role for various suppliers and ensuring production scale-up. If the product is under development, for example in the Quantum domain, There is a bigger role for example for a research institution launching a start-up. The financial sector contributes by making the necessary capital available. A prerequisite for the success of an ecosystem is strong participation from the private sector. The role to be played in taking the armed forces, and thus the Netherlands, forward is shown below for each partner.

Defport

Defport is a new public-private partnership instrument that helps implement this strategy and create the right preconditions for success. Within Defport, the Ministry of Defence, the Ministry of Economic Affairs, the Netherlands Industries for Defence and Security (NIDV), the Confederation of Netherlands Industry and Employers (VNO-NCW), the Association of Mechanical and Electrical Engineering (FME), research institutes and the financial sector work together to reduce the gap between supply and demand, so that the Defence market becomes more attractive for research institutes and companies to become or remain active in, or to invest in.

Defport:

- Facilitates the **continuous dialogue** between research institutions, industry, the financial sector and the government, as the Ministry of Defence involves research institutions and companies early in its demand specifications through this platform.
- It gives these partners the opportunity to prepare for the needs of the Ministry of Defence in varying compositions and to submit **proposals**.
- Will facilitate **partnerships** of companies and research institutes in which **propositions** are created that directly contribute to strengthening the Dutch position in the international supply chain, including through the availability of physical locations. Active cooperation takes place with the **NLD_regions programme office**.
- Ensures identification of **preconditional bottlenecks** and collaborates on solutions.

The progress of industrial cooperation, best practices and bottlenecks are periodically discussed in **Defboard**, Defport's administrative consultative body, which includes the Minister of Defence, the Minister of Economic Affairs and senior representatives from industry and research institutions.

Interministerial

Meeting the armed forces' needs for combat is not the only issue. We also need to focus on deterrence and finding opportunities for collaboration between civilian and military applications of technologies and products. And it is essential to strengthen the Dutch knowledge base that underpins this:

- The Ministries of Defence, Economic Affairs and Education, Culture and Science will **cooperate** more intensively on the five NLD focus areas. Every euro can only be spent once: we are looking for multipliers from different government sources. This involves, for example, connecting the five NLD focus areas and broader activities to the agendas of the NTS and projects within the National Growth Fund (NGF), such as Quantum Delta NL, Photondelta, NXTGEN Hightech and the AI Coalition 4NL.
- **Instruments** of other ministries are being made accessible to the Defence Industry and this will increase. To promote synergy between existing trade and other instruments and networks, mainly in the field of civilian innovations and technologies that can be applied in the Defence domain, there is increased cooperation between the Ministries of Defence, Economic Affairs, Education, Culture and Science and Foreign Affairs.
- Moreover, several **interministerial research programmes** have been launched which focus on geopolitical developments.

Regional cooperation

Regions, provinces and municipalities possess a lot of industry and innovation strength that can add enormous value to the effectiveness of the Ministry of Defence. Every region counts. Through strategic innovation collaboration with industry, the Ministry of Defence is developing regional ecosystems. For example, a nationwide network is under development, focusing on innovations with both civilian and military applications. In these ecosystems, the needs of the Ministry of Defence are aligned with industry supply and innovation cycles are accelerated. The Ministries of Defence and Economic Affairs will make more use of this potential by:

- Together with the provinces, Regional Development Agencies and industry, setting up regional collaborations and **building ecosystems**, in which research institutions, elements of the Defence organisation, companies and investors cooperate.[12] These ecosystems enable the development, implementation and scale-up of innovations. The various collaborations and ecosystems put focus on **innovations that can be applied in the military domain now or in the future**.

- In the regional development agencies, **venture building programmes** are set up in order to give start-ups (funded by programmes or through SecFund) and innovative SMEs a better chance to succeed.
- Ensuring that knowledge is more quickly incorporated into the organisation by giving (local) **research institutions** a more prominent role in these ecosystems.
- Centrally organising the implementation of these ecosystems through **the NLD_regions programme office**. The NLD_regions will contribute to developing capabilities, matching supply and demand and accelerating innovation cycles now and in wartime. As such, **regional offices** will be set up to match that supply and demand, while central coordination will be strengthened. In this way, we will form a **nationwide network**, in which knowledge and opportunities will be exchanged and forces will be combined.

Wireless Optical Communication Alliance The regional approach of the Ministry of Defence (NLD_Regions) has led to the creation of the Wireless Optical Communication Alliance (WOCA). This is a unique cooperation between the Ministry of Defence, regions, research institutes and Dutch companies that possess unique knowledge of light technology and high-precision industrialisation capabilities for optical communication. A collaboration that has the ambition to grow into a new industry and growth engine for the Netherlands that will also provide the necessary capabilities for the Ministry of Defence. The Brainport Innovation for Technology & Security (BITS) ecosystem takes this cooperation further by making projects and opportunities concrete.

Test facilities

Limited access to test facilities and military infrastructure poses a challenge for start-ups and scale-ups seeking to develop innovative technologies with military applications. The Ministries of Defence and Economic Affairs want these companies to have affordable and accessible testing environments to validate, certify and further develop their products. This not only prevents their growth and scale-up from being impeded, but also increases their attractiveness to investors. The Ministries of Defence and Economic Affairs facilitate this by:

- Improving **access to test facilities** and military support through structural cooperation with start-ups and scale-ups and better utilisation of essential infrastructure.
- Setting up a **Centre of Excellence Uncrewed Systems** for uncrewed systems. Acting via this centre, various companies will be able to further develop and produce systems together with the operational user. This centre is supported by a network of several **regional labs** with diverse specialisations, such as ground vehicles, vessels, underwater vessels and flying vehicles.
- In addition, the **Ministry of Economic Affairs** will explore possibilities on how to improve **accessibility** to **innovative start-ups and scale-ups** at the research institutions conducting research for the Ministry of Defence. The Ministry of Defence and the relevant research institutions are actively collaborating on this.

International

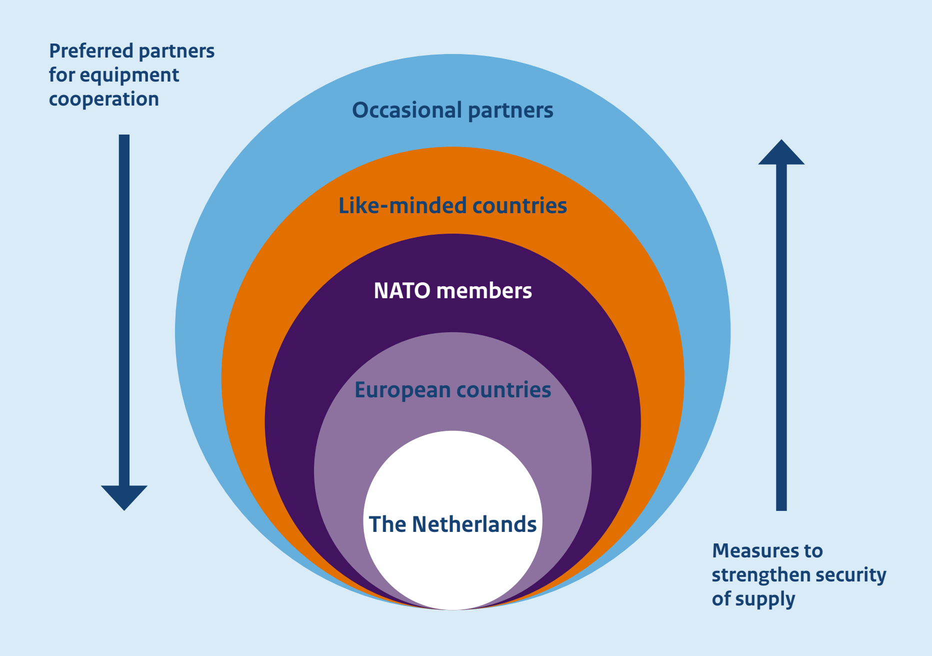
Given the geopolitical situation, it is important that the Netherlands and NATO allies meet the requested NATO capability targets faster and smarter, while also filling capability shortfalls faster and smarter. This calls for strong international engagement and good positioning of the NLDTIB in international supply chains. Transatlantic equipment cooperation remains important. However, the Netherlands and Europe need to take more responsibility for their own security.

Research, technology development, innovation and industry are highly intertwined in an international context. Cooperation is therefore crucial for acceleration. The Netherlands does this by:

- Engaging more proactively in European **capability development**, **pooled demand**, **cross-border research, technological and industrial cooperation**, **access to supply chains**, **co-production** and **standardisation.** Drawing on its national technological and industrial strengths, the Netherlands will take the lead in positioning the NLDTIB in international production chains, setting up framework contracts, local co-production of weapon systems and development processes stemming from EU, NATO and bilateral collaborations.
- The **knowledge base** will also be strengthened internationally through bilateral and trilateral, European and NATO cooperation in the form of knowledge exchange, coalition building with other countries and diplomatic engagement.
- Buying the **same products** as our allies more often. What is good for them is also good for us (and vice versa). Coordinated or joint procurement of Defence products leads to larger orders providing long-term certainty for the industry. The Ministry of Defence will always keep in mind the involvement of the Dutch Defence industry in the relevant production chains when deciding on joint procurement.
- Committing to **strengthening the entire process**: the connection from research and development to production and maintenance is strengthened through international collaboration. At every point in the chain, Dutch companies and research institutes can deploy their unique knowledge and skills, but it takes long-term commitments to grow from one part of the process to the next level. Examples include participating in the European Defence Fund and the European Defence Industrial Programme, DIANA and the NATO Innovation Fund (NIF) in the NATO context, and bilateral agreements, such as the Dutch-German partnership.
- Actively **supporting** the NLDTIB. As buyers of end products in the Defence domain are governments, and national security interests always play a role in national Defence industrial policy, active support of the NLDTIB is an important factor in this uneven playing field. The government will therefore actively work to position the NLDTIB in international and European development and procurement processes. To enable this, the **government-to-government** (G2G) and **business development** activities will be expanded. Greater use is also being made of the **mission network**, including Defence and Innovation attachés, economic departments and NFIA[46] representatives.
- The planned Dutch participation in **OCCAR**[47] will contribute to strengthening the NLDTIB's position in procuring Defence goods developed in Europe through the opening of supply chains.
- Actual **European procurement**. As a Member State, this is the main driver for scaling up the European Defence Industry. That is why the Ministry of Defence will procure equipment more strategically and the European origin of products will carry more weight than before. The Ministry of Defence will direct whom we cooperate with, and in what area, to an even more strategic degree; see Figure 3.
- In cases where the Ministry of Defence purchases equipment outside the NLDTIB, the Ministries of Defence and Economic Affairs apply the **industrial participation policy** to position the Dutch Defence industry in international production chains and will keep doing so. In addition, the Ministry of Defence will contractually enforce that Dutch companies acquire a **strategic position** in such trajectories in order to strengthen security of supply.

46 Netherlands Foreign Investment Agency.
47 OCCAR (Organisation Conjointe de Coopération en matière d'Armement) is a European organisation that manages defence equipment projects. Current OCCAR members are: Belgium, France, Germany, Italy, Spain and the United Kingdom.

Figure 3. **International cooperation**



European cooperation

In the European context, the Netherlands focuses on:

- **Optimal use of European instruments**. The NLDTIB will actively participate in available EU Defence industry programmes in the fields of knowledge development, innovation, capability development, industrialisation of Research & Development (R&D), production capacity and in EDA capability technology and capability development programmes. This requires investments by the NLDTIB as well as financial contributions and other supporting measures from the government to ensure that the position of Dutch industry is strengthened and the NLDTIB plays an essential role in European innovation, development and production chains.

- Continued importance of the role for the **European Defence Agency** (EDA) in the instruments currently being developed by the European Commission. For now, the EDA is and will remain the main European forum for capability development.

- **Countering European fragmentation** in the Defence market. The Ministry of Defence recognises the advantage of a strong European Original Equipment Manufacturer (OEM) base within the European defence market that can compete globally. If the number of final manufacturers is reduced through mergers, acquisitions and investments, this will benefit interoperability between armed forces and create economies of scale. However, some form of competition between end providers in Europe is desirable from a military and economic point of view. A precondition for the Netherlands is that European OEMs open their supply chains to suppliers from all over Europe, including the Netherlands. Open supply chains are more resilient, efficient and innovative. For the Netherlands, the focus is on integrating our specialised industrial ecosystems, especially related to the five NLD focus areas, into European innovation and production clusters through active government support.

Cooperation within NATO

In the NATO context, the Netherlands focuses on:

- Strengthening the Dutch commitment to **innovation and research in the NATO context**. This strengthening is needed throughout all phases from idea to implementation: from using NATO's start-up accelerator DIANA to support start-ups in realising innovative solutions for the armed forces, to the NATO Innovation Fund (NIF), which focuses on promising companies that want to bring innovations to the market, and the foundation within the NATO Science & Technology Organisation, where joint scientific research is being conducted.

- More **European responsibility** for security within the alliance. Strengthening the European Defence Industry is important for achieving the NATO Capability Targets assigned to the Netherlands within the NATO Defence Planning Process. Stronger European allies make for a stronger NATO as a whole.

- Encouraging joint procurement in which operational requirements are integrated as much as possible. Where this leads to acceleration, the Netherlands will make further use of NATO's **available procurement organisations**, such as NCIA and NSPA to pool demand.

- Greater transparency in terms of national investment plans, pooled demand, and joint production and procurement of munitions and equipment and increasing interoperability and interchangeability, for example through **standardisation**. These lines of action run within NATO as part of the Defence Production Action Plan (DPAP) and the Defence Industrial Production Board (DIPB).

Cooperation with Ukraine

Ukraine's knowledge base, its innovative capacity and Defence industry already play an important (and growing) role in the European Defence industry. This is why the Netherlands is actively pursuing:

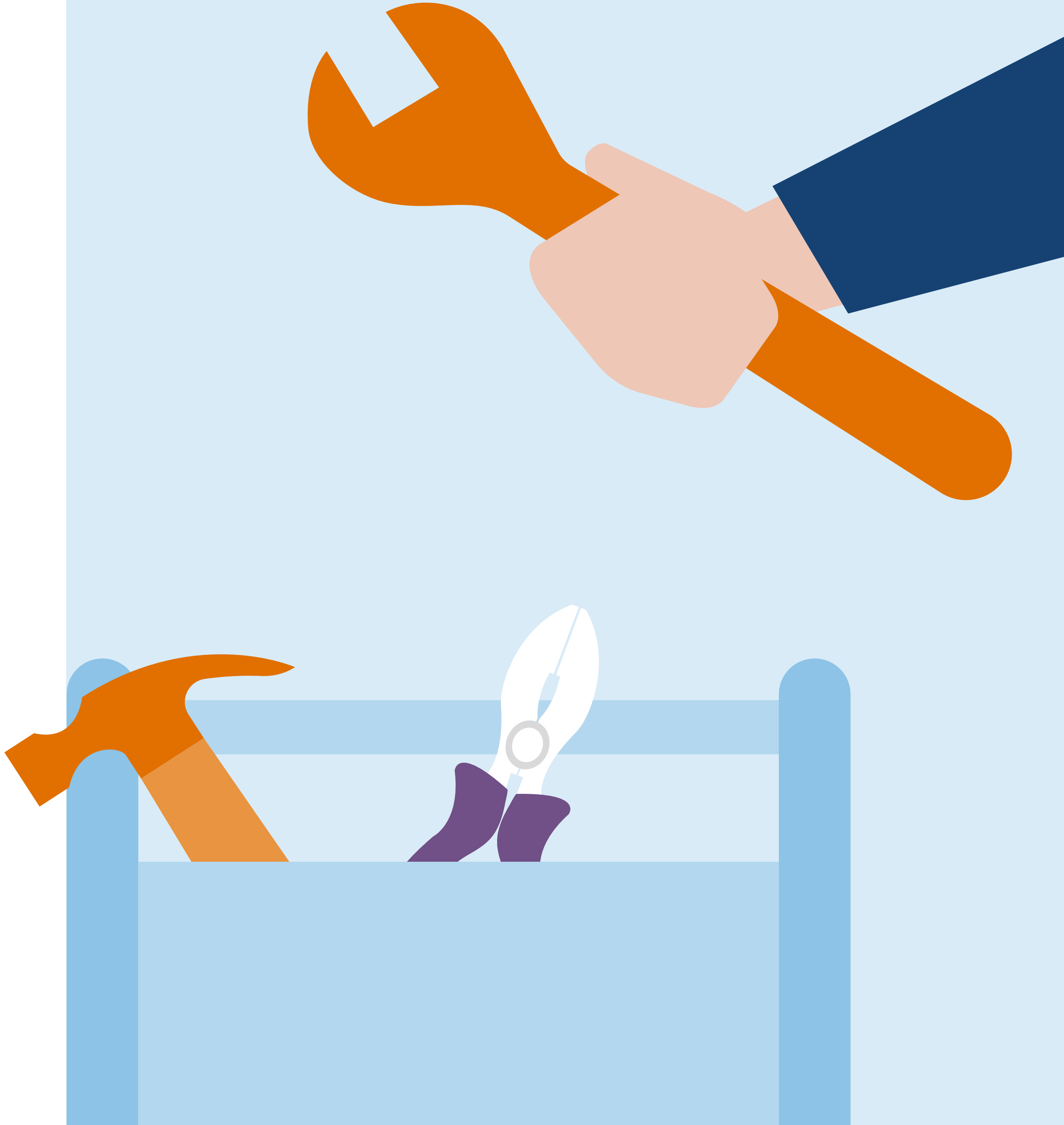
- **Strengthened cooperation** with Ukraine to learn from Ukrainian lessons, but also to contribute to Ukrainian effectiveness and Defence industry with Dutch knowledge and solutions. In this way, we strengthen European security and position the NLDTIB and knowledge base (also for the long term).

- **Active support** from the government to the NLDTIB for cooperation with Ukrainian industry to strengthen knowledge exchange, production capacity and innovation strength between the two countries.

- Stronger bilateral industrial and technological cooperation through possible **reinforcement of the Defence attaché department** at the Dutch Embassy in Kyiv.

04

ASSESSMENT FRAMEWORK & TOOLBOX INSTRUMENTS



Assessment framework

Starting from the 2024 Defence White Paper, the Ministry of Defence focuses strongly on strengthening the NLDTIB, thereby strengthening its own armed forces and contributing to the strategic autonomy of the Netherlands and Europe. These resources will partly be deployed within existing instruments, but also through new or redefined instruments and possibly in co-financing structures with private parties.

The assessment framework below aims to make integrated considerations and ensure that spending benefits the future resilience of the armed forces and the (accelerated) scaling-up of the Defence industry. The assessment framework contains a number of principles that are important to the Ministry of Defence when spending the resources:

- Necessity and added value:
  - Does it contribute to a **need of the Dutch armed forces?**
  - Does it contribute to a **need of NATO/EU?**
  - Does the additional investment ensure **(future) acceleration and/or scale-up** of the Defence industry?

- Position of the Netherlands within the European supply chain
  - Does the area contribute substantially to **strengthening the Dutch position** within the European supply chain and thus contribute directly to increasing strategic autonomy?

- Necessary support from the Ministry of Defence
  - Is **support from the Ministry of Defence necessary** to achieve technological and industrial scale-up? (I.e., when other instruments are insufficient, and private investments are not (sufficiently) present or available)

In addition, a number of assessment criteria are taken into consideration:

- Suitable partners and preconditions
  - To what extent is the business case healthy?
    - Is there a need among our international partners?
    - Is civil application possible?

- Presence of knowledge/industry in the Netherlands
  - What degree of **knowledge/technology/industry is present in the Netherlands** and/or is it realistic to build this substantially?

Applying this assessment framework means learning and continued development; it means learning by doing. Only by looking at frameworks in a different, innovative way can we achieve change and acceleration. To maintain control over a responsible spending process and to safeguard learning moments, an evaluation moment will be scheduled one year after the implementation of this strategy, and the assessment framework will be adjusted as needed.

Toolbox instruments

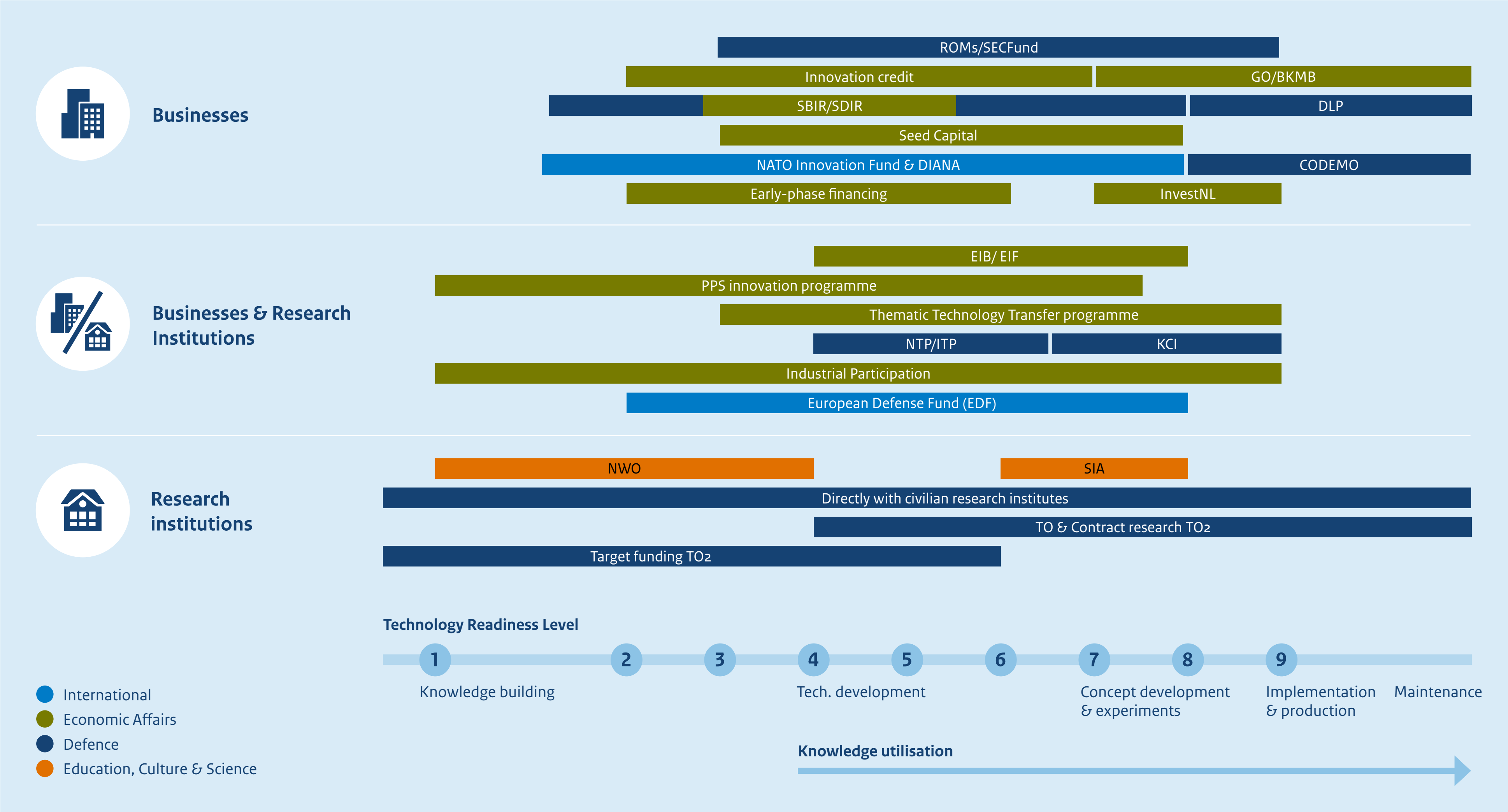
To strengthen the NLDTIB and knowledge base, especially in the 5 NLD focus areas, several instruments are used. These are instruments that the Ministry of Defence has available internally, that already exist interministerially and will be used (more often/better) by the Ministry of Defence, and that exist internationally and will be used (more often/better). The figure on the next page shows what instruments are available, providing an overview of the current and anticipated ‘menu’ of options.

- **Continued development of the toolbox of instruments**:
  - **Existing instruments will be evaluated and optimised**, such as the Ministry of Defence’s national technology development instrument and the internal Defence SDIR instrument, which has only been applied a few times so far;
  - Objectives and needs are the priority, **instruments should support these and will be cleverly linked or combined** to facilitate acceleration, such as working with calls and unsolicited proposals informed by coordinators at the Ministry of Defence. This will foremost be about seeking out the right instrument based on the submitted idea instead of the other way around;
  - **More interministerial instruments will be used**, such as programming research needs through the Ministry of Education, Culture and Science and applying the Thematic Technology Transfer (TTT) instrument of the Ministry of Economic Affairs to a Defence case;
  - **International instruments will be cleverly used** to bring out the role of the Netherlands in value chains more strongly;
  - Where necessary, **existing and new instruments will be developed (or further developed)** for the Ministry of Defence.

- **The Industrial Participation policy (IP)**, implemented by the Ministry of Economic Affairs and the Ministry of Defence, will be used to strengthen the NLDTIB and give it an international position.

  - If the Ministry of Defence acquires equipment from outside of the Netherlands, for example because we do not have the relevant industry in-country, the Ministry of Economic Affairs will, through Industrial Participation, make a case for the **involvement of Dutch Defence companies and research institutes** in the development, production and maintenance of Defence equipment. We do this to safeguard our national security interests.
  - **For every procurement over € 5 million**, we will work with (potential) suppliers to determine whether realising Industrial Participation could contribute to the essential security interests as identified in this strategy.
  - In implementing its policies, the Ministry of Economic Affairs will also pay particular attention to **connecting SMEs** and the contribution that the NLDTIB can make to the **construction and scaling up of the (European) defence industry**, both within the fundamental Defence areas and within the five Dutch focus areas.

Figure 4. **Toolbox instruments**



There is a list of abbreviations on page 35.

In conclusion

The Netherlands and Europe face major military challenges. This is not merely a challenge for the Ministry of Defence alone: the whole of society must be mobilised. We need to strengthen our armed forces and, in that context, the Dutch knowledge, industry and technology base. As a small but high-tech country, we must make smart choices to build and nurture our (future) critical locations in international value chains. We must face this challenge together, both nationally and internationally. Taking different actions as a government means experimenting, learning, developing and evaluating.

Many of the new actions we are setting up involve learning by doing. The progress of the strategy will be reported on via the State of Defence and the strategy will be evaluated after four years, reviewing the extent to which the strategy's objectives are met and whether any adjustments are required. Every year, we will issue an action agenda that translates the frameworks of this strategy into the priorities of that year. We are counting on our existing and new partners to join us in tackling the challenges the Netherlands is facing.

Abbreviations

ACP	Autonomous Collaborative Platforms
ADCF	Air Defence and Command frigate
AI	Artificial Intelligence
AM	Additive Manufacturing
APOS	Action plan for production of uncrewed systems, *Actieplan Productie Onbemenste Systemen*
ASW	Anti-Submarine Warfare
C3I	Command, Control, Communications & Intelligence
CBRN	Chemical, Biological, Radiological & Nuclear
CSO	Chief Science Officer
CODEMO	Defence materiel development committee, *Commissie Defensie Materieel Ontwikkeling*
DBDAAP	Defence Big Data Advanced Analytics Platform
DIANA	Defence Innovation Accelerator for the North Atlantic (DIANA)
DIS	Defence Industry Strategy
DLP	Defence Lifecycle Plan
EDA	European Defence Agency
EIB	European Investment Bank
EIF	European Investment Fund
EM	Electromagnetic
EOV	Electronic warfare *(elektronische oorlogsvoering)*
EZ	Ministry of Economic Affairs *(Ministerie van Economische Zaken)*
FME	Dutch associaion of mechanical and electrical engineering, *Federatie Metaal- en Elektrotechnische Industrie*
GO/BMKB	Dutch government schemes for business finance guarantees and SME credit guarantees, *Garantie Ondernemingsfinanciering/borgstelling MKB-kredieten*
GPS	Global Positioning System
HCSS	The Hague Centre for Strategic Studies
HGIDSP	Data science platform for highly classified information, *Hoog Geclassificeerde Informatie Data Science Platform*
IP	Dutch government policy for industrial participation, *Industriële Participatie*
ISR	Intelligence Surveillance and Reconnaissance
KCI	Short-cyclical innovation *(kort-cyclische innovatie)*
LIDAR	Light Detection And Ranging
MALE	Medium Altitude Long Endurance
MARIN	Maritime Research Institute Netherlands
MCM	Mine Counter Measures
MCMV	Mine Counter Measure Vehicle
MDO	Multi-Domain Operations
SME	Small and Medium Enterprise
ML	Machine Learning
MUM-T	Manned-Unmanned Teaming

NIDV	Foundation for Dutch industries for defence and security, *Stichting Nederlandse Industrie voor Defensie en Veiligheid*
NLDTIB	the Netherlands Defence Technology Industrial Base
NLR	Netherlands Aerospace Centre
NTP/ITP	National Technology Project/ International Technology Project
NTS	National Technology Strategy
NWO	The Netherlands Organisation for Scientific Research
OCCAR	Organisation Conjointe de Coopération en matière d'Armement
OCW	Ministry of Education, Culture and Sciences
OEM	Original Equipment Manufacturer
OODA	Observe, Orientate, Decide and Act
PNT	Position, Navigating and Timing
PRS	Public Related Service
REAIM	Responsible Use of AI in the Military Domain
RNLN	Royal Netherlands Navy, *Commando Zeestrijdkrachten*
ROM	Regional Development Agency
RVO	the Netherlands Enterprise Agency
SBIR	Small Business Innovation Research
SDIR	Strategic Defence Innovation Research
SIA	Foundation for Innovation Alliance
SKIA	Strategic Knowledge and Innovation Agenda
SMART	Specific, Measurable, Acceptable, Realistic and Timebound
SSA	Space Situational Awareness
TEVV	Test, Evaluation, Validation and Verification
TNO	The Netherlands Organisation for Applied Science
TO	Technology development
TO2	Partnership of the Dutch research institutes for applied science (Deltares, MARIN, NLR, TNO and Wageningen Universiteit Research)
TRL	Technology Readiness Level
UAS	Unmanned Aerial System
UAV	Unmanned Aerial Vehicle
USV	Unmanned Surface Vehicle
UUV	Unmanned Underwater Vehicle
UXV	Unmanned Unidentified Vehicle
VNO-NCW	Union of Dutch Enterprises – Dutch Christian Employers Union
WOCA	Wireless Optical Communication Alliance

Annexes

Ambitions for Dutch focus area | **QUANTUM**

2026

The Ministry of Defence has an active or **leading role** in existing international ecosystems and cooperative initiatives.

The Ministry of Defence has a flexible strategy that enables it to adapt to **evolving quantum technologies.**

Together with research institutions and industry, the Ministry of Defence conducts research into **system components that are essential** for the effective use of quantum sensors for Positioning, Navigation, Timing (PNT), RF sensing and other military-relevant applications.

Sensing

The Ministry of Defence invests in research into cryptography, including **Post Quantum Cryptography**.

Resilience

In addition, the Ministry of Defence has research done into what is needed to make **Quantum Key Distribution systems** certifiable. This is done in close consultation with stakeholders within the central government.

Networks

The Ministry of Defence actively focuses on knowledge building with the aim of understanding the possibilities and impossibilities of **quantum computers**.

Compute

2027

Based on a continuous trend and technology watch, the Ministry of Defence initiates various knowledge-building and innovation projects with the aim of being **quantum-ready and resilient**.

The Ministry of Defence has set up a **quantum sensing field test bed**, outlined specific use cases and selected consortia that can test their solutions in a **specific Defence context**.

Sensing

The Ministry of Defence has insight into which **entangle-based use cases** are military-specific and which components need to be developed for that.

Networks

The Ministry of Defence actively focuses on knowledge building with the aim of understanding the possibilities and impossibilities of a **quantum internet**.

Networks

2030

Dutch **industry and research institutions** are familiar with the **opportunities and threats** of quantum technology and work specifically on the applications required by the Ministry of Defence. The Ministry of Defence cooperates with Dutch research institutions and industry, acting as **co-developer** in specific cases.

The Ministry of Defence has **systems with quantum sensors** and works with partners on validation.

Sensing

2045

The Ministry of Defence and Dutch industry have guaranteed access to a **universal quantum computing** power of > 1 million qubits.

Compute

Overarching ambition

Technology and industry-specific ambition

2028

The Ministry of Defence has **integrated multi-sensor technology** that cooperates on various platforms and domains for situational awareness on land, at sea and in the air.

In collaboration with civilian partners, the Ministry of Defence has an **advanced sensor network** in the North Sea (fixed and mobile), developed for the **protection of infrastructure at sea**.

Sea

At all levels (group-platoon-company-battalion-brigade), land units have **one or more types of sensors** (optical, ESM, radar, acoustic, multispectral, hyperspectral, thermal, CBRN and LIDAR) for **better situational awareness**.

Land

The Ministry of Defence **has advanced target acquisition and fire control technology** for both joint fires and above/underwater warfare, which could potentially accelerate the sensor-to-shooter cycle through networking.

Land - Sea - Air

The Ministry of Defence **has advanced sensors to detect airborne threats**, from exoatmospheric to just above the horizon, both in country and forward deployed.

Land - Sea - Air

2030

The Ministry of Defence has **integrated multi-sensor technology** that cooperates on various platforms and domains for **situational awareness** on land, at sea and in the air.

The Ministry of Defence **has an air defence sensor network** that can detect and identify drones, missiles and aeroplanes in all layers of the atmosphere and in the exoatmosphere.

Land - Sea - Air

The Ministry of Defence **has a network of various types of sensors for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR)**, which increases situational awareness for both land and maritime operations (Ground & Sea Picture).

Land - Sea - Air

The Ministry of Defence **has hardware and software solutions** for data and sensor fusion from sensors in various domains, where necessary in line with NATO standards.

Space - Land - Cyber - Sea - Air

By 2030, the Ministry of Defence **will have a national modular and open PNT architecture** for sensor fusion of various PNT sensors to enable robust positioning and timing in military applications and critical infrastructure.

The Ministry of Defence **has advanced multi-sensor technology developed in the Netherlands that is fit for purpose** (with smaller Size, Weight and Power - SwaP) to allow the Ministry of Defence to introduce the envisaged (mostly small) unmanned platforms.

Land - Sea - Air

2035

The Ministry of Defence **has modular multi-sensor systems** with high-quality Dutch technology integrated on all manned and unmanned platforms on land, in the air and at sea, with sensor fusion both on and between the platforms.

The Ministry of Defence uses **at least 50% Dutch sensor technology** on all platforms (sailing, flying, driving, manned and unmanned) and the Netherlands is a European and NATO frontrunner in (active and passive) radar/RF, (underwater) acoustics and optical technologies.

Land - Sea - Air

The Ministry of Defence and **Dutch research institutions and industry are European leaders** in the development of high-end radar chips and technology (including compact, energy-efficient); 50% of their components are produced locally; integration and assembly take place entirely in the Netherlands.

Land - Sea - Air

The Ministry of Defence has a data layer with explainable AI and sensor fusion that integrates larger numbers of multifunctional sensors, and these are **applied and integrated in a modular fashion** on all platforms. Dutch integrators supply hardware and software layers, while the Ministry of Defence retains ownership of the military tactical software and AI.

Land - Sea - Air

Overarching ambition

Technology and industry-specific ambition

2027

The Ministry of Defence must be able **to use information from data strategically** in order to be efficient and effective at all levels. This is not only about its own power, but also about how the Ministry of Defence should deal with disruptive technological developments by opponents (DS&AI Strategy 2023-2027).

Establishing a connection between the needs of the Ministry of Defence (demand) and the knowledge that our collaborative partners possess and develop (supply).

Base in order: preconditions for digital transformation have been set.

The Ministry of Defence has set up broad data governance for the **use of Data Science and AI within ethical and legal frameworks** with clear allocation of roles and responsibilities.

The Ministry of Defence has opted for an approach that focuses on the use of Data Science and AI solutions for operational effects, with **Generative AI and Intelligent Imaging** as important focus areas.

The Ministry of Defence has positioned sufficient **personnel with knowledge** and expertise in the field of Data Science and AI.

The Ministry of Defence uses **high-quality information technology** for the deployment of data science and AI in multi-domain operations in all conditions of use.

2032

Reorientation and acceleration for the benefit of main task 1 and integration of multi-domain operations.

The Ministry of Defence **positions the Data Science Centre of Excellence as a national knowledge authority** and a leading international knowledge partner in the field of Data Science and AI.

The Ministry of Defence has **improved data availability** through an IT infrastructure for data Science, with links between categorisation levels and to data sources.

The Ministry of Defence sets up a **federative system for data, data science and AI**. Existing Data Science Cells are further developed and a central data management department is set up.

The Ministry of Defence has a **method** and system in place for the verification, validation and accreditation (VVA) of AI applications.

The Ministry of Defence enables the use of AI applications in all military operational contexts (static, deployed, mobile, dismounted and on-foot) via **edge computing**.

Continuing platforms and **using links** for uneven interfaces and **structurally offering** data warehouses, including data management.

2038

Multi-domain tand integrated operations.

DS&AI capabilities in the various domains have been organised for the purpose of **joint and combined interoperability**.

Platforms (cloud, DBDAAP and HGIDSP) have been developed into a **Defence-wide data platform**.

Overarching ambition

Technology and industry-specific ambition

Ambitions for Dutch focus area | INTELLIGENT SYSTEMS - UNMANNED SYSTEMS (INCL. AMBITIONS FOR APOS)

2026

By 2026, the Ministry of Defence will have an **industry-innovation programme** in place that facilitates short-cycle innovation and production.

By 2026, the Ministry of Defence will have identified the **preconditions and success factors for a healthy ecosystem** for unmanned systems and will be working with partners to enable large-scale experimentation, training and deployment.

The Ministry of Defence uses **unmanned maritime toolboxes**, consisting of a combination of UAVs, USVs and/or UUVs.

Sea

The Ministry of Defence has further scaled up the **deployment of small UAVs** for ISR support for units, groups and battalions during land operations.

Land

The Ministry of Defence makes widespread use of existing **MALE UAVs**, works on the integration of **launched effects** and continues to develop existing **MUM-Ts** for attack helicopters.

Air

2028

The Ministry of Defence, in collaboration with Dutch industry, has developed the **first uncrewed USV** that can safely navigate autonomously and safely.

Sea

The Ministry of Defence has (swarms of) attack drones at its disposal, which preferably contain **50% hardware and software developed in the Netherlands**.

Air - Land

The Ministry of Defence has **automated detection** and **response to cyber attacks** (effective cyber defence and labour-extensive).

Cyber

The Ministry of Defence uses **AI in cyber operations**, including AI-enabled techniques and tactics for reconnaissance, surveillance, tracking, analysis, discovery, defence evasion & control.

Cyber

2030

By 2030, there will be a **healthy ecosystem** for uncrewed systems in the Netherlands, providing the Ministry of Defence with scalable and innovative products and with which the organisation will constantly interact in short-cycle innovation to improve those products.

By 2030, the Ministry of Defence will use a **symmetrical and 'fit for purpose' strategy** for both the deployment of and the defence against drones.

By 2030, the Ministry of Defence will have established the **preconditions** that will enable responsible use, including a TEW capability.

By 2030, the Ministry of Defence will have created a **strong strophic positive**, through alternative supply chains for raw materials, and the NLDTIB will produce Dutch components for unmanned and autonomous systems.

The Ministry of Defence has **autonomous navigation platforms**, preferably developed in the Netherlands, with reliable AI, software and advanced sensors.

Land - Air - Sea

The Ministry of Defence has set up a **tank battalion** in which unmanned ground vehicles with various functionalities (counter-UAS, anti-tank, ISR) and UAVs effectively work together with tanks.

Land

The Ministry of Defence has **unmanned air ISR capacity**, which can have various effects in enemy airspace. This can be done both at high altitudes and in the lower atmospheric layers (in addition to space capabilities). The Ministry of Defence works with autonomous UAVs to cover the range of tasks performed by fighters and (attack) helicopters.

Air

2034

The Ministry of Defence has **large USVs** that are seaworthy and suitable for operational tasks in various domains, including anti-air warfare (AAW), anti-submarine warfare (ASW), amphibious support and the protection of vital infrastructure on the North Sea bed.

Sea

2035

The Ministry of Defence **integrates uncrewed** and **crewed platforms** (sailing, flying, driving) into a network with advanced sensor fusion and autonomous operations for electronic warfare, air defence, joint firepower and ground manoeuvres.

The Ministry of Defence possesses **Autonomous Collaborative Platforms** (ACP) as unmanned supplements to the flying main weapon systems. ACPs can be widely deployed for ISR, Electronic Warfare, attack, training or refuelling.

Air

The army has implemented **manned-unmanned teaming** within all types of units, utilising a network for combined arms combat, which also enables autonomous operations.

Land

Overarching ambition

Technology and industry-specific ambition

2026

By 2026, the Ministry of Defence will have access to facilities in the Netherlands that are available to quickly determine whether new material applications can be **produced and automated** on a larger scale.

In addition, this will, from 2026 onwards, allow the gap between TRL 6 and TRL 9 to be bridged more quickly than is currently the case, by **accelerating the demonstration process**.

By 2027, a **minimum viable** version of an ecosystem in the field of composites will be operational:

- The ecosystem must make a significant contribution to **realising ambitions** by facilitating cooperation between parties based on common ambitions and roadmaps.
- In the ecosystem, the **golden triangle**) comes into its own and the entire value chain (from raw materials producer to OEM) is represented with commercial business models that support this ambition in which the Ministry of Defence acts as an orchestrator and is responsible for military demand articulation.
- Civil **demand articulation** is integrated in the ecosystem to increase the proposition of the innovation network. This includes linking up with current civil (growth fund) projects and calls.

2030

By 2030, Dutch industrial parties will be the **second source supplier** for at least three OEMs delivering composite applications for integration in military platforms (one maritime, one land and one air platform) and of multifunctional glass fibre-reinforced Composites that meet the blast and ballistic requirements and are lighter than steel alternatives.

Overarching ambition

Technology and industry-specific ambition

Ambitions for Dutch focus area | **SMART MATERIALS - ADDITIVE MANUFACTURING**

2025

In 2025, the Ministry of Defence establishes the **Defence Additive Manufacturing Strategy**, which specifies the SMART (operational) objectives and how to implement these in the existing organisation.

In 2025, the Ministry of Defence will select **three AM Use Cases** in which to invest in order to achieve material readiness and operational effects, and will develop series of projects for these use cases that support the armed forces in their needs in the areas of technology development, implementation and scaling the use of additive manufacturing.

In 2025, the Ministry of Defence will launch at least one innovative procurement process for the development of **AM applications for the armed forces**.

2027

By 2027, the Ministry of Defence will have established its **AM policy**. This is an integrated and implementable policy in which the interfaces with other policy areas have been recognised, and the implications for these areas are regulated in preconditions in the areas of procurement, acquisition, contract management, product management, cyber and stock management, and others.

2028

By 2028, the operational and financial value of AM for the Ministry of Defence is objectively established in respect of **three SMART objectives** from the AM strategy.

By 2028, the Ministry of Defence will have access to **Additive Manufacturing facilities** that will be used as part of regular logistical maintenance, in order to support training and missions.

2030

By 2030, the Ministry of Defence has set up AM as a fully-fledged production support tool within Defence's **integrated logistic support**.

By 2030, there will be an **AM ecosystem** that effectively contributes to improving stock availability (exploitation) and improving platform performance (innovation). This ecosystem is of great added value for the Ministry of Defence and its partners in terms of the contribution to the armed forces' operational capacity and economic earning capacity as well.

By 2030, there will be a **hub** which is capable of fulfilling the role of supply and demand manager and scouter for the benefit of innovation for military and civilian purposes (dual use). To this end, the existing roadmap for AM will be further elaborated in 2025, integrating both exploitation and exploration.

2035

By 2035, the Netherlands will have a **leading global position** in at least one niche area in the military domain, to be specified. This position provides a strong international negotiation position and contributes to strategic autonomy.

Overarching ambition

Technology and industry-specific ambition

2026

By 2026, the **governance of the space domain as a military domain has been established**, which will also be used to develop and answer strategic innovative questions.

By 2026, the Ministry of Defence will have a **Space Operations Centre** where information from its own infrastructure and international information will be integrated into Space Data, Products and Services.

2027

By 2027, the Ministry of Defence will have its own **resilient network of satellite capacities**, integrated sensors and data processing that will provide a reliable information position from, in and through space.

2028

By 2028, the Ministry of Defence will guarantee strategic autonomy and sovereignty through a strong Dutch **OEM value chain** in the space domain

Where possible, the Ministry of Defence will use a **Public Regulated Service (PRS) receiver** by 2028 by collaborating with European partners on the development of PRS technology and integrating it into military systems.

PNT

By 2028, the Ministry of Defence will use **laser communication** for safe and controlled data transfer.

SATCOM

2030

By 2030, the Ministry of Defence will carry out decision-making for **Space Situational Awareness** (SSA), Earth observation and satellite communication using advanced Dutch **(AI/ML) algorithms**, supported by a robust, proprietary infrastructure for data interoperability.

By 2030, the Ministry of Defence will have **advanced miniaturised sensor technologies** to enable high-quality earth observation and space domain awareness.

AO - SSA

By 2030, the Ministry of Defence will have a **national modular and open PNT architecture** for sensor fusion of various PNT technologies to enable robust positioning and timing in military applications and critical infrastructure.

PNT

By 2030, the Ministry of Defence will have access to a **European Space-based Early Warning capacity** for effective air and missile defence of European territory and deployed units.

2035

By 2035, the Ministry of Defence will execute **constellation management**, use **smart materials for satellites**, execute in-orbit servicing, and can operate satellites autonomously.

Overarching ambition

Technology and industry-specific ambition

Ambitions for Dutch focus area | **MARITIME**

2026

From 2025, there will be early and far-reaching collaboration with **(Dutch) industry and research institutions** for the development and construction of new ships.

By 2026, the RNLN will have the **latest MCMV**, which, in combination with unmanned systems, can carry out stand-off MCM operations.

2028

By 2028, the RNLN will have **drones and ships** that run on various (sustainable) fuels.

By 2028, the RNLN will have **online and real-time ship maintenance data** available on shore.

By 2028, the Commander of the Royal Netherlands Navy (RNLN) will be able to deploy **multiple (autonomous) UXYs** in a networked operational capacity.

By 2028, the Ministry of Defence will be able to carry out networked and integrated missions in the high-violence spectrum using a combination of **(limited) manned systems** and ships.

From 2028, spare parts will be **interchangeable** between ships (logistical sustainability).

2029

By 2029, RNLN units will have **automated coordination** for the deployment of hard kill, soft kill and signature management by their own unit.

2030

By 2030, the RNLN will have unmanned systems that can **carry out stand-off ASW & ISR operations**.

By 2030, the Ministry of Defence will be able to carry out networked and integrated missions in the highest violence spectrum using a combination of **limited manned platforms and UxVs** and ships.

By 2030, **MDO operations with an accelerated OODA loop** based on information from all domains.

By 2030, full national implementation of **deep precision strike above** water and, by 2035, **underwater** all over the world.

By 2030, **dispersed seabasing** for land-based operations.

2032

By 2032, the Netherlands will have a **common recognized maritime picture from seabed to space**.

2034

By 2034, the RNLN will have the **first replacement ADCF** that, in combination with manned and unmanned systems, can operate as a system of systems in the highest violence spectrum.

By 2034, RNLN units will have **Directed Energy Weapons** as operational C-UxV capacity.

2035

By 2035, UXVs will be able to **autonomously** carry out a mission.

By 2035, ship maintenance can be predicted and planned in between missions **based on automatically collected ship/system data**.

By 2035, **signature management** (including signature manipulation) is fully integrated into the defence chain of a task group.

By 2035, RNLN units will have **robust scheduling functionalities**, the deployment of weapon systems being considered integrally.

By 2035, ships will be able to carry out their **mission without Organic Level Maintenance**.

By 2035, the **Dutch ecosystem** will have sufficient knowledge to nuclear-propel the next generation of ships.

By 2035, the RNLN will have the technology that allows **ships to autonomously isolate and repair battle damage**.

Overarching ambition

Technology and industry-specific ambition

Annex 2: Fundamental Defence areas

Breakdown of areas into sub-areas and mapping of the five Dutch focus areas

Fundamental Defence area	Sub-area
1. Cyber & Electronic Warfare	**1.1** Electronic Warfare
	1.2 Cyber Operations
	1.3 Cyber and Electro-Magnetic Activities
	1.4 Cybersecurity & Cryptography
2. Sensor Systems	**2.1** Radar
	2.2 Sonar
	2.3 Electro-Optics & Infra Red
	2.4 Non-traditional Sensors
	2.5 Sensor fusion
3. Weapon Systems	**3.1** Basic Weapon Technology
	3.2 High Energy Laser / Directed Energy Weapons
	3.3 Guided and Hypersonic Weapons
	3.4 Lethality
	3.5 Smart munition production and safe use

Fundamental Defence area	Sub-area
4. Platform Systems	**4.1** Land Systems
	4.2 Maritime Systems
	4.3 Air Systems
	4.4. Space Systems
	4.5 Power & Energy Resilience
	4.6 Signatures
5. C3I and Digitization/ Command, Control, Communications & Intelligence and Digitization	**5.1** Network Infrastructure & Communication
	5.2 Information technology
	5.3 Intelligence
	5.4 Decision support & Human control
	5.5 Command & Control
	5.6 Digital transformation

Fundamental Defence area	Sub-area
6. Protection	**6.1** CBRN
	6.2 Ballistic Protection
	6.3 Soldier Protection
	6.4 Explosive Ordnance Disposal & Mine Counter Measures
	6.5 Counter Terrorism & Security
	6.6 (Counter) Hybrid
7. Human Performance & Medicine	**7.1** Human Performance & Resilience
	7.2 Training, Education & Simulation
	7.3 Effects in the Cognitive Domain
	7.4 Military Health
8. Autonomous & Unmanned Systems	**8.1** Uncrewed Systems
	8.2 Autonomy
	8.3 Human Machine Teaming

Fundamental Defence area	Sub-area
9. Logistics	**9.1** Smart and predictive maintenance
	9.2 Supply chain management
	9.3 Transport
	9.4 Life Cycle Support Analysis
10. Defence applicable Key Enabling Technologies & Methodologies	**10.1** AI, Data Science & Machine Learning
	10.2 Advanced Materials & Additive Manufacturing
	10.3 Modelling & Simulation
	10.4 Quantum Technologies
	10.5 Semiconductor technologies
	10.6 Operational Analysis
	10.7 Strategic Foresight & Analysis
	10.8 Human Resource Management & Organization
	10.9 Ethics & Legal
	10.10 System Engineering & Innovation

Mapping of fundamental Defence areas based on the NTS

Fundamental Defence areas	Key technologies (NTS)
Cyber & EOV	• **Cyber security technologies***
Sensor systems	• Sensor and actuator technologies, **Imaging technology*** • Photonic / Optical detection and processing
Weapon systems	
Platform systems	• **Energy materials*** • Photovoltaics
C3I and Digitalization	• Software technologies and computing, Digital connectivity technologies
Protection	
Human Performance & Medicine	• **Biomolecular and cell technologies***, Biosystems and organoids, Biomanufacturing and bioprocessing, Bio-informatics • Nanobiotechnology / Bionanotechnology
Autonomous & Uncrewed Systems	• Robotics
Logistics	
Defence-applicable Key technologies & methodologies	• **Artificial intelligence en Data science***, data analytics and data spaces, Neuromorphic technologies • Optical, electronic, magnetic and nanomechanical materials, Metamaterials, Soft / biomaterials, Thin films and coatings, Smart materials • Nanomanufacturing, Nanomaterials • Additive manufacturing, Digital manufacturing technologies • **Quantum Computing, Communication & Sensing*** • Systems engineering • **Microelectronics / Semiconductor technologies***
Cross-cutting	• **Optical systems and Integrated photonics***, Photon generation technologies • Digital Twinning and Immersive technologies • Construction and Structural materials • Functional devices and structures (on nanoscale) • **Mechatronics and opto-mechatronics***
Other	• **(Bio)process technology, including process intensification***, (Advanced) Reactor engineering, Separation technology, Catalysis, Analytical technologies, Electricity-driven chemical reaction technologies • Micro- and nanofluidics

* The technologies indicated with an * are the prioritised technologies from the National Technology Strategy 2024.
The 10 prioritised key technologies have a positive impact on the Dutch economy, societal challenges, national security and Dutch technological leadership.

Annex 3: Strategic Defence Innovation Research

Accelerating this innovation-oriented procurement process requires a structured approach, under which the Technology Readiness Levels (TRL) are leading. These can be subdivided into two phases:

- Phase 1. TRL 1-6 (Low readiness): Covers technology development from basic research, a feasibility study to a tested prototype.
- Phase 2. TRL 6-9 (High readiness): Focuses on validation and implementation of a technology, from working prototype tested in a relevant environment to full validation and scale-up.

Strategic Defence Innovation Research (SDIR): SDIR provides a flexible and accessible framework for projects where it is not yet clear at the start which innovation-based approach is most appropriate and whether, after experimentation, we actually want to proceed to scale-up. By integrating the phasing of experimentation and scale-up into a single approach, SDIR provides scope for procurement to engage with the project and market players at an early stage, and is thus a programme that supports SMEs, start-ups and scale-ups in the development of new technologies. This is done through phased funding, with a paid feasibility study in Phase 3 and a paid prototype in Phase 4. Based on SDIR, we can choose SBIR, InnovationPartnership or a Challenge with or without award.

When we want to develop technologies beyond a prototype, the most appropriate procurement process to acquire or further develop them quickly is considered within the model of Strategic Defence Innovation Research.

Annex 4: Defence Industry Financing Action Plan

Sufficient access to finance is the air that every part of the industry breathes. In order for the NLDTIB to be scaled up, companies must therefore have adequate access to funds. Due to the special characteristics of the Defence industry, private funding does not materialise to a sufficient degree. To bring about the necessary funding, public and private players must act together to remove bottlenecks. The Ministry of Defence has made 1.1 billion euros available for scaling up and strengthening the (innovative) Defence industry, part of which will be made available for public contributions to tools.

The Defence industry is no ordinary market. It has a limited number of customers (mainly governments), a limited number of suppliers (mainly providing Defence-specific goods such as ammunition and fighter jets), a longer product lifetime than holds in the civilian market, uncertain historical demand (driven by geopolitical factors) and many technically complex products (including technological and market risk). The Dutch defence industry is also characterised by small and some very large companies. Company size is an important element in the type of financing sought. Small companies have fewer options (less bank financing and less access to financial markets) than large companies and therefore face bigger financing bottlenecks.

Appendix 4 continued

Bottlenecks

Despite the existing public and private financing options, there are still bottlenecks in the financing of the Defence industry.[48] SMEs and start-ups in particular, but the largest companies within the NLDTIB[49], as well, experience challenges in obtaining funds such as working capital and, more specifically, in many cases venture capital, too. Funding options may also be limited for the scale-up phase.[50] Underlying explanations include reluctance of financiers due to reputational risks, high development risks and market uncertainties. The industry demands concrete orders, a view of continuity and quick and easy requirement and procurement processes from the government. This also plays an important role in access to finance.

The Ministry of Defence is committed to broadly identifying and mitigating such bottlenecks that negatively affect the Defence industry's funding position. To this end[51], the Ministry of Defence has commissioned several independent studies, and has drawn up an action plan on the basis thereof.

The identified bottlenecks require a joint approach from the triangle of government, private financiers and companies in the Defence industry. The government has an important role to play in meeting structural demand and, where possible, removing bottlenecks that can result from, for example, government processes or the requirements set on suppliers in this respect. Private financiers also play an important role, namely in actually funding companies in the Defence industry to enable the necessary scale-up of production. In short, the major societal challenge we face calls for these three parties to act together. The main lines of action of the Ministry of Defence are included as part of a **Defence Industry Financing Action Plan** with the following 4 tracks:

1. **Long-term demand & scale**, including the following actions:
   - **Reviewing the requirement process and ensuring long-term demand** in order to provide security and long-term continuity. For instance, the House of Representatives and the Government have committed to making the 2%-norm standard by law. The higher expenditure gives the Ministry of Defence more leeway to better meet its long-term needs, and thus also fulfils the industry's need for long-term security.
   - In addition to longer-term demand security, **sufficient scale** of demand is also important to make production profitable. In this context, the Netherlands is committed to **pooling demand** at the international level, both with groups of countries and at the NATO and European levels.

2. Mobilising private funding & **better using existing financing instruments**:
   - **Making better use of the existing system of subsidies and financing instruments and linking them** to the Defence industry, such as Invest-NL, instruments of the Netherlands Enterprise Agency (RVO), the European Investment Bank (EIB, EU), the European Investment Fund (EIF, EU) and other funds.
   - **Supporting NLDTIB** to attract private financing and investments from banks, funds and other capital providers (such as private debt/equity, family offices, insurers and pension funds) by the Defence industry and other ecosystems of companies and research institutions. This will be further promoted by way of the Financing Table under the public-private platform Defport, which industry, research institutions and the government all participate in.
   - Where existing financing instruments prove insufficient, the government will explore the option of setting up its **own instrument**, either nationally or internationally. An example of this is the SecFund, a fund – placed with the Brabant Development Agency – that was set up with the aim of reducing financing bottlenecks for start-ups and innovative SMEs in the dual-use segment.

48 Letter to the House of Representatives on funding bottlenecks in the defence industry, solutions and action lines, 2025 (Parliamentary Paper 31 125, no. 133).
49 Berenschot report titled 'Nederlandse defensie- en veiligheid gerelateerde technologische industriële basis', 2024.
50 European Commission rapport 'Access to Equity Financiering for European Defence SMEs', 2024.
51 Letter to the House of Representatives on funding bottlenecks in the defence industry, solutions and action lines, 2025 (Parliamentary Paper 31 125, no. 133).

Appendix 4 continued

3. Optimising processes & removing practical obstacles
   - The Ministry of Defence recognises that the **bank guarantee requirement** for the provision of advance payments has a restrictive effect in certain cases. In various cases, exceptions have already been made to this requirement. The Ministry of Defence is consulting with the Ministry of Finance to determine how exceptions to the prescribed bank guarantee requirement for pre-financing can be applied more often and how the process and conditions for this can be accelerated and formalised.
   - The Ministry of Defence is investigating the possibilities of using **information provision** to support private investors in their need for information, including meeting obligations in the area of Customer Due Diligence (CDD).
   - The Ministry of Defence is also taking steps to remove bottlenecks in the procurement process. In accordance with the 'Security of Production and Supply of Ammunition and Defence Equipment' action agenda, the Ministry of Defence is abandoning the mantra of 'best product for the best price' and is giving greater consideration to the timely availability and origin of the product - preferably Dutch or European - in equipment procurement.

4. **Strengthening dialogue and increasing awareness:**
   - The government has started a **dialogue** between the triangle of government, financiers and the Defence industry, resulting in the initiative to establish a public-private platform called 'Defport'. The aim of this platform is to strengthen the dialogue between the various parties and to bring together supply and demand. This is how we will facilitate efficient scale-up.
   - **Increasing awareness of national and EU (investment) funds** and opportunities.
   - Creating **awareness** among private financiers of the need to finance the Defence industry and encouraging private financiers to reduce 'over-compliance' when this complicates financing.

This action plan will be implemented together with other governments, the financial sector and industry. Consultations will inter alia take place at a Financing Table under the public-private platform Defport. Furthermore, the Ministry of Defence continues to use dialogue to promote the importance of the financing position of the Defence industry. The House of Representatives will be periodically informed of the progress and results.

Annex 5: Social Innovation Action Lines

To move forward in a strong and smart fashion and in cooperation with others, we as the Ministry of Defence must innovate successfully. Innovation comes about in the interaction between people, organisations and technology. The Ministry of Defence's priority in the area of social innovation lies in the following four action lines:

- **Flexible resilient mindset:** In order for our organisation to be agile and innovative, it is essential that our employees have a flexible, resilient, and professional mindset. This is because the beliefs we hold about our own potential - our intelligence, talents and skills - largely determine our attitudes, performance and working relationships. A fixed mindset can limit us because it keeps us stuck in old patterns and undermines our ability to learn and grow. By fostering a culture that embraces a flexible resilient mindset, we strengthen the foundations for growth, innovation and inclusion. Creating such a mindset also forms the basis for making a difference in wartime (warrior mindset).

- **Innovative leadership:** If, as an organisation, we want to grow in being innovative, it is important that our managers innovate along with us. They, too, need to move towards a flexible mindset and develop leadership accordingly. Leadership which is fundamentally about creating trust, safety, responsibility, ownership and cooperation in a team. For this, it is essential that they, too, develop a number of soft and hard skills so that their own self-awareness grows and they are also given tools to encourage this in others. Alongside this, it is important that managers encourage innovation in practice. They must be able to break patterns that hinder implementation of innovation. We want to give our managers more tools to help them develop in this area and thus increase their scope of action in effectively guiding innovation in the workplace.

Appendix 5 continued

- **Modernising practices:** Modernising the organisation is necessary to become and remain agile and future-proof in a rapidly changing world. New technologies, societal changes and increasing complexity of issues require innovative structures and flexible work processes to increase the adaptivity of our armed forces. We want to work more in short cycles within value chains to be more agile, allowing us to process feedback quickly, become more flexible, become better able to manage risks and thus also ensure greater involvement and increased motivation. We want to get back to the original intention of working together based on trust and responsibility. We want to put our main task up front and have the rules/structures support it, not the other way around. Our intention is to stimulate diversity and create a safe working environment in which multidisciplinary teams can dare to innovate based on their own practice. In addition, we want to become a learning organisation that learns by doing and records and documents the knowledge it gains. Short-cycle, investigative and using our collective internal and external intelligence. In this way, we ensure that social innovation not only ensures more efficient operations, but actually contributes to increasing the organisation's agility and power to act.

- **Implementation capability:** Organisations are adaptive systems, with complex and continuous interactions between the system world (structures and processes) and the living environment (socio-cultural dynamics), the different levels within an organisation and the external environment.[52] This interdependence makes successful innovation (resulting in a high degree of implementation) a complex process that is unpredictable and dynamic[53] because it is strongly dependent on the 'innovative capacity' of an organisation.[54] This innovative capacity is currently under pressure within the Ministry of Defence, causing knowledge and innovation projects to take too long or get bogged down.[55] The 'problem' causing these innovations to fail is often a symptom of an underlying systemic pattern. As a result, past interventions did not always achieve the desired effect, as the pattern was not broken. However, we have now identified various measures to break this pattern and increase the innovative capacity. From the start of an innovation process, consideration is given to consciously and effectively influencing the DOTLMPLFFII[56] factors in the organisation with the aim of increasing the success and chance of operational use of both technological and non-technological innovations. In order to effectively influence these factors, it is essential that the client and the place where the implementation is to take place are involved in the innovation process from the start and remain involved in order to continue to visualise the systemic pattern. Preferably, there will also be innovation in daily practice to align as closely as possible with the changing reality. In cooperation with our research partners and industry, we will continue to do further research to increase the chance of successful implementation and improve our effectiveness.

52 't Hart, de Jong, Mente, Heeren, Delahaij & Dujinhoven. 'Narratief Sociale innovatie bij Defensie' report. TNO 2022 R10123.
53 't Hart et al., 2022.
54 Doctoral thesis 'Intelligence for a Complex Environment', S.J.H. Rietjens, 2024: Innovative capacity is described as an organisation's ability to continuously convert knowledge and ideas into new products, processes and systems that benefit the organisation.
55 'Knowledge Offensive for the Ministry of Defence', AWTI advisory report, 2024.
56 Doctrine, Education, Training, Leadership, Resources, Personnel, Legality, Finance, Facilities, Information, Interoperability; t' Hart et al., 2022.

Annex 6: Evidence-informed policies

The government as a whole recognises the need to create better quality policies and to ensure a longer-term view on complex issues. Improving the positioning of knowledge within ministries is an important point of attention in this regard. In line with this, five interministerial development paths have been established[57], aimed at preconditions for creating evidence-informed policies.
Knowledge building and application are necessary along the entire process from idea to implementation. The Ministry of Defence therefore also aims to strengthen its role as a smart policy maker, developing evidence-informed policies. Below is an explanation of how the Ministry of Defence follows the development paths that have been defined throughout the government.

1. **Strengthening structure:** *Strengthening the design and organisation of the knowledge function*
   The way in which knowledge development and utilisation is organised is called the knowledge function. It is important to strengthen the design and organisation of the knowledge function. By staffing formal key positions such as Chief Scientific Officer and Chief Scientific Advisor, the Ministry of Defence aligns with the government-wide knowledge function. In addition to contributing to a better positioning of the knowledge function within the ministry itself, this helps to ensure a consistent approach to evidence-informed policy development by the entire Central Government.
2. **Focus on strengthening expertise:** *Strengthening knowledge sharing and utilisation for policy purposes as part of official expertise*
   Individual policy makers play an important role in strengthening evidence-informed policy development. The right skills and (accessibility of) expertise enable them to effectively utilise (semi-)scientific insights for policy purposes. This is part of the official expertise that policy makers need and can be developed further by investing in knowledge skills - for example through training - and by making knowledge more easily accessible - for example through lunch lectures. It is important that there is room and appreciation for the development of policy officers in this area.
3. **Working on the future together:** *Interministerial cooperation on complex,* long-term *issues*
   Cooperation is key in tackling current and future strategic (knowledge) issues that transcend the boundaries of individual ministries. One example of this is the Dutch National Science Agenda, in which governments, researchers, social organisations and citizens work together to develop and utilise knowledge. Such collaborations should remain possible by making funds available for multi-partner research. The ultimate goal is for the Central Government to be better prepared for future challenges, develop long-term plans and create policies that are future-oriented and implemented coherently. The Ministry of Defence remains committed to set up interministerial programmes to jointly develop knowledge regarding long-term challenges. The joint consideration of issues is supported by the expertise and research results of assessment agencies such as the Netherlands Institute for Social Research (SCP), the Netherlands Environmental Assessment Agency (PBL) and the Netherlands Bureau for Economic Policy Analysis (CPB).
4. **Knowledge function in the policy cycle:** *Improved embedding of the knowledge function in existing work processes and policy cycle*
   In order to effectively utilise knowledge for policy purposes, the knowledge function must be further integrated into the policy cycle. This is being worked on at an interministerial level, account being taken of how existing instruments such as the Integral Policy Cycle (IPC) and the Policy Compass can be utilised. Securing ownership of the knowledge function is a necessary precondition for this, as it ensures clear responsibility and accountability in the use and development of knowledge.

57 Based on recent advisory reports on knowledge in policies: Rathenau Instituut (2024), 'De rol van de chief scientist bij kennis voor beleid'; 't Hart et. al. 2022; WRR report (2023) 'Deskundigheid als koopwaar'; ABDTOPConsult report (2023) 'Kennisrijk samenwerken: Verkenning Rijksbrede kennisfunctie'; AWTI report (2021) 'Kennis, kunde, beleidskeuzes'.

Appendix 6 continued

5. **Change does not happen by itself; we effect it together:** *Reviewing the way in which we work together and make decisions*
   To improve cooperation between ministries, it is necessary to optimise the way in which decisions are made and responsibilities are divided (governance). This means that there must be a clear structure that indicates how the various ministries and departments can work together. This also involves mutual cooperation between the various parties involved within the Central Government and other research parties. An important aspect of this is creating proximity between these groups, so that they can effectively collaborate and share knowledge. Participation in government-wide networks and consultative structures such as the CSO network, the Secretary Generals' meeting and the National Strategic Council can stimulate cooperation and the exchange of knowledge.