

Strategic Direction for Defence Innovation



Government Offices of Sweden
Ministry of Defence

Contents

Foreword	3
Basic premises	4
Innovation that benefits from civilian-military synergies	9
Research and development of critical technologies and skills supply	13
Capability needs and materiel development	16
International collaboration	18
Conclusion	23

Foreword

Against the backdrop of a tense global security situation and Russia's full-scale invasion of Ukraine, Sweden's defence is currently undergoing a major build-up. In the national budget for 2024, the appropriation for military defence increased by more than SEK 27 billion over the previous year.



Pål Jonson
Minister for Defence

The war in Ukraine has shown how critical it is to have a defence that can quickly adapt to the enemy and find innovative solutions to new military problems. The Swedish Armed Forces noted in its interim report on the government remit concerning lessons learned and experiences from the war in Ukraine that:

“To successfully meet this change, partnership between the public and private sectors is needed, particularly with the aim of bringing together academia, industry and government in a triple helix model of innovation.”

The war thus illustrates the need to quickly identify military applications for existing civilian and military technologies. Sweden therefore needs to develop tools to transform knowledge into new materiel and solutions. Sweden's defence innovation capability must be enhanced. Over the past fifty years, development of emerging and disruptive technologies in areas such as AI, quantum technology and autonomous systems has taken place at an accelerating pace. This development has been driven predominantly by the civilian sector. With the aim of improving our military capability, we need to find methods and approaches to utilise emerging and disruptive technologies for defence needs, particularly through improved conditions for collaboration between the defence and civilian sectors.

We are currently seeing challenges in this, particularly due to the gap between the defence and civilian sectors that has been widening since the end of the Cold War. In times of peace, economic growth and optimism, major cutbacks were made in the Swedish Armed Forces and other defence agencies.

To improve the conditions for collaboration, the Government launched a defence innovation initiative in early 2023. Within the framework of this initiative, I have met with a wide range of actors on a recurring basis to discuss obstacles to, and possibilities for, this work with an eye to the future. In these dialogues, I have been struck by the strong desire from the civilian sector to contribute to our defence's continued development. This, in combination with Sweden's excellent innovation climate and profound technological know-how in the business sector, provides good conditions for collaboration.

The Government defence innovation initiative is a multi-year development and change process in which government, industry and academia have important roles to play. It is essential to guide technological development and transform research and development into defence innovations for our defence's operational capability and a strong security policy position. This also means that we create conditions to further strengthen our joint defence capability in international cooperation with Allies and partners.

Basic premises

The security situation in Sweden's neighbourhood is marked by instability and unpredictability. The antagonistic threats against Sweden are broad and growing increasingly complex. An armed attack against Sweden cannot be ruled out – nor can the use or threat of military force against Swedish interests. The most obvious cause of the rapid deterioration of the security situation in Europe is Russia's full-scale invasion of Ukraine, in violation of the UN charter. China's growing global ambitions, and regional conflicts in places such as the Middle East and Africa further complicate the security situation. The structural and substantial deterioration of the security situation has fundamentally changed the conditions for Swedish security and defence policy. In response, Sweden is undertaking the greatest security policy shift seen in modern times. Swedish membership of NATO and a significant rearmament of Sweden's national defence capability are two of the most important parts of this adaptation.

Innovative emerging and disruptive technologies and materiel that improve defence and security are of central importance amid the intensifying political, ideological and economic tensions shaping the international situation. Rapid technological and security policy change requires new solutions to strengthen defence capability. Relations between China and the United States are the single most important factor for global geopolitical and geoeconomic developments in the coming years. These two major powers view success within new technologies as a critical necessity, without which their competitiveness and interests cannot be protected. Technological development is essential in both the civilian and military areas. A country's innovation capability for strengthened national defence is achieved by rapidly repurposing civilian technologies.

Defence innovation is a strategic capability that is needed for the ability to overcome military and defence-related problems more quickly and better than the opponent over time. Strong Swedish defence innovation capability is a strategic competitive advantage that benefits defence and security in times of peace, crisis and war.

A reinforced and advanced innovation system must be based on already-functioning innovation and development structures. These structures should be broadened and enhanced, and complemented by measures to promote civilian-military collaboration. By virtue of their technological innovation capability, civilian actors have an important role to play in developing emerging and disruptive solutions to military- and security-related challenges.



The Swedish Armed Forces conduct an unannounced readiness check.

Photo: Antonia Sehlstedt/Swedish Armed Forces

The aim of this strategic direction is to identify the main policy elements of the political ambitions and priorities that will guide the work to improve defence innovation capability in Sweden. In the future, it should be possible for military risks, problems and defence needs to be presented to, and addressed by, a broader range of actors in society. Promoting collaboration between actors from different sectors creates conditions for greater collective comprehension and problem formulation. At the same time, the risk for unnecessary overlapping decreases. This provides conditions for the acceleration and mutual strengthening of military and civilian innovation, which enhances Sweden's defence capability, resilience and innovative capacity. Moreover, it helps boost competitiveness and strengthens security.

The basic premise of this strategic direction is to examine how the Swedish innovation system as a whole can become better at managing and utilising civilian-military synergies, not least those associated with emerging and disruptive technologies. The term 'defence innovation' refers to the part of the innovation system that serves as a structure to create innovative applications, services and processes that specifically strengthen defence capability, with a focus on military capability.

Good conditions in Sweden

By international standards, Sweden is a country that is characterised by a strong ability to compete, innovative capability and adaptability. Despite Sweden's size, it is home to internationally competitive defence companies that produce advanced defence systems for all domains. Large Swedish corporations that operate in the international civilian market are world-leading in areas such as connectivity and transport. Sweden is also a place where many small and medium-sized enterprises that develop emerging and disruptive technologies are launched, often with the help of venture capital. They contribute to renewal and provide an innovative dynamic in the market.



Higher education institutions basis of innovation, where emerging and disruptive fundamental and applied research of the highest quality often go hand in hand with frontline technologies. Research institutes and science parks develop knowledge and promote collaboration between various actors in a way that contributes to development and renewal of Sweden's world-leading innovation capability and enhances its competitiveness.

MAX IV Laboratory at Lund University.

Photo: Perry Nordeng/Lund University

Development of emerging and disruptive technology requires time and resources, as it is dependent on expertise, funding and infrastructure. Many technological fields have both civilian and military applications. Developing such technologies specifically for military applications drives up costs and often results in inferior solutions than those that can be achieved through joint or coordinated development. Civilian development of technologies and applications in fields such as machine learning, new materials and energy systems offers great potential to contribute to Swedish military- and defence-related capability development and resilience.

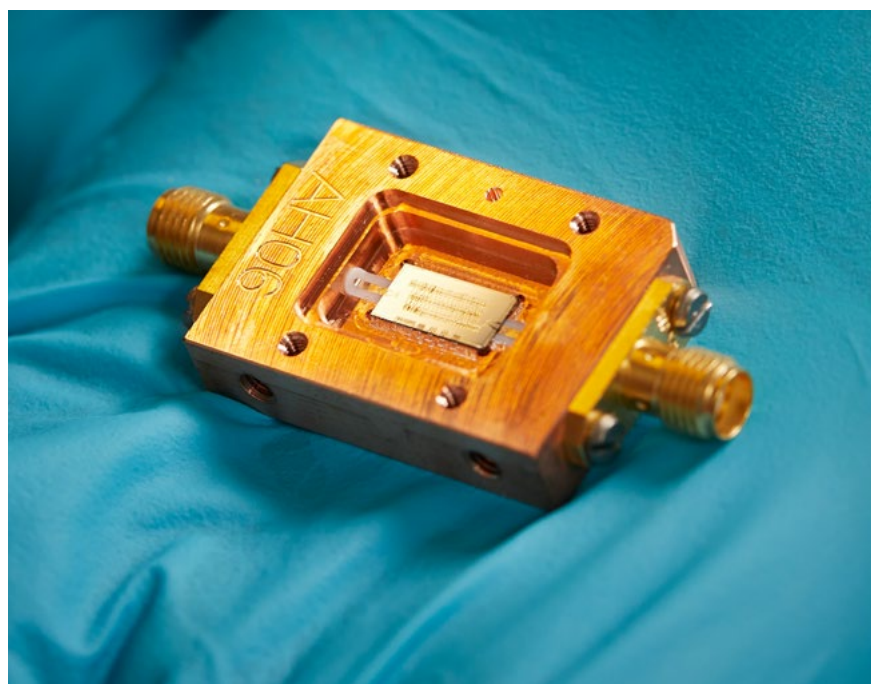
Measures identified in this strategic direction have a strong focus on fostering an effective culture of innovation in light of a deteriorated security situation, and in times of crisis and war. Dynamic forms of collaboration between government, academia and industry need to be developed. Private actors need to be given better conditions to understand and, where applicable, be included in analyses of issues such as military problem formulations, capability requirements and other defence-related needs.

Sweden has a tradition of collaboration between government agencies and the business sector. Sweden also has good conditions to gather central actors from various sectors, increase collaboration and realise civilian-military synergies so as to solve military- and other defence-related problems in a quicker, more effective and innovative way.

Emerging and disruptive technology and conflicting security policy interests

Accelerating and revolutionary technological development is taking place in parallel with growing conflicting geostrategic interests. While innovation in recent decades primarily focused on competitiveness in an increasingly globalised market, the currently emerging global power struggle is characterised by an intensifying technological arms race. War in Europe and a strategic arms race in Asia have sharpened the focus on the importance of not only ensuring access to production and a head start in emerging and disruptive technologies, but also preventing an undesired spread of technology. Applying emerging and disruptive technologies in new, innovative goods and services is a key to economic success, a security policy instrument and a necessity for ensuring future competitiveness in defence and the economy in general.

International and national plans and strategies for promotion of both development and protection of strategically important technologies are becoming increasingly common. Mature structures for closer collaboration between government, industry and academia are an example of promotion initiatives that more countries are now striving to establish so as to secure control over central parts of the value chain. Similarly, investment screening in sensitive operations and enhanced export controls are examples of new protective instruments in Sweden and the EU. The major challenge lies in striking the right balance between providing good conditions for research, innovation, enterprise and international cooperation, and ensuring that the central government can protect and gain control of strategically important innovations and technologies. Importing critical technology from our allies and security partners requires good controls at national level. Sweden should be viewed as a credible party that can both protect sensitive technology from undesired leaks and promote innovation.



Low-noise amplifier for quantum computer at Chalmers University of Technology.

Photo: Anna-Lena Lundqvist/Chalmers University of Technology

Innovation concerning technology and systems is characterised not only by civilian leadership, but also internationalisation. Due to high costs and complexity, no country can be self-sufficient in all technological fields that potentially benefit security and defence. In many cases, the companies that drive innovation are international. Internationalisation and technological competition affect global supply chains. This impacts security of supply and conditions for international cooperation on emerging and disruptive technologies and defence systems.

The countries and alliances with which we already have or may develop trusting relations also offer a greater possibility to jointly strengthen defence innovation work. This means there are good prospects for collaboration within the EU and NATO, and with other international partners that share our interests and values.

In light of the prevailing security situation, management of, and cooperation on, development of emerging and disruptive technologies and systems for defence, security and resilience are key for the development of Sweden's central innovation system.

Conclusions

- Innovative emerging and disruptive technologies and materiel that are potentially beneficial for defence and security are essential against the backdrop of the intensifying geopolitical power struggle and substantially worsening security situation.
- Sweden has a very good foundation on which to build innovation systems that benefit from civilian-military synergies. However, a holistic approach is needed to stimulate increased collaboration between the civilian and defence sectors.
- Cooperation on emerging and disruptive technology with partner countries benefits Sweden's defence capability and security policy relations.
- The innovation culture within the defence sector needs to be updated to shorten the lead times for finding solutions to military and other defence-related challenges.

Innovation that benefits from civilian-military synergies

In the defence and civilian sectors in Sweden, there is already a long tradition of close collaboration between government, academia and industry referred to as the ‘triple helix model of innovation’. This approach is something we must preserve and intensify. However, developing a more complete innovation system for civilian-military synergies requires closer ties between sectors and better integration of their work.

It is primarily civilian demand, venture capital and commercialisation of the civilian market that drive new knowledge and technological development. This makes it even more important to develop collaborations between the civilian and defence sectors with the aim of instilling a work approach through which technologies that benefit Sweden’s defence capability and resilience are quickly identified and employed.

Considering how important civilian industry is to technological development, there is great untapped value to be harnessed when the civilian and defence innovation systems are linked. This involves resources being used more effectively, as cutting-edge expertise within relevant technological areas is in shortage. Through joint projects, more resources can be put into one and the same initiative, thus sharing the risk and accelerating the tempo. This also sparks interest for additional actors to join in and contribute.

Successful collaboration should provide added value for everyone involved. In historical terms, numerous innovations with civilian applications have been developed through civilian-military collaboration. For this reason, the Government’s defence innovation initiative aims to enhance defence capability while at the same time contributing to increased competitiveness.



Magnetic linear accelerator at
MAX IV Laboratory.

Photo: Perry Nordeng/Lund University

New innovation programme for civilian-military synergies takes shape

In the Budget Bill for 2024, the Government proposed allocating a total of SEK 88 million for 2024, SEK 90 million for 2025 and SEK 247 million for 2026 for a military innovation programme and research under the auspices of the Swedish Armed Forces. With the aim of improving the conditions for defence innovation, the Government is setting aside SEK 60 million from these funds for 2024 for an innovation programme that promotes civilian-military synergies with the objective of enhancing military capability. An equivalent amount is expected for the years 2025 and 2026. Moreover, the Government has tasked the Swedish Armed Forces and the Swedish Governmental Agency for Innovation Systems (Vinnova) with jointly initiating and implementing the programme. Programme development will take place in collaboration with relevant organisations and government agencies, including the Swedish Defence Materiel Administration.

The innovation programme for civilian-military synergies is expected to include several important components to promote innovation, such as an accelerator function to drive innovation development from the early stages all the way to the mature concept. The programme will also comprise a function for development of research infrastructure and institutions, such as mobility of staff, collaboration platforms, international partnerships and environments for data, simulation and demonstration. Moreover, it will also include a function for innovation and development capability focused on competence development within strategic areas, and cross-fertilisation between civilian and military environments.

The innovation programme will serve as a pilot project for coordination of civilian-military synergies and use of a combination of tools and models. These will be tailored to meet current and future challenges over various time, development and maturity horizons.

The innovation programme will also contribute to creating possibilities for the Swedish Armed Forces and Vinnova to collaborate with other relevant government agencies with the aim of increasing knowledge about technological developments at the nexus of civilian and military innovation. For example, the Defence Materiel Administration and the Swedish Defence Research Agency have an important role to play in the innovation system. Increased collaboration between government agencies contributes to both strategic foresight and quicker technological development and application.

The innovation programme provides prospects for collaboration and should lower thresholds, not least for actors within open innovation environments, to take part in projects aimed at enhancing military capability. To ensure appropriate development, it will be important to establish a programme committee or equivalent body comprising actors from industry and government agencies, including higher education institutions.



Drone for CBRN detection.

Photo: Jimmy Croona/Swedish Armed Forces

The innovation programme will be designed in a collaboration between the Swedish Armed Forces and Vinnova to enable synergies with Vinnova's already broad range of programmes. One example is the Advanced digitalisation programme, for which the Government will set aside SEK 500 million a year starting in 2024. This amount will be matched by the business sector. The programme also comprises some of the most advanced Swedish projects in the area of digitalisation. The innovation programme for civilian-military synergies now provides increased opportunities for cooperation.

Innovation and adaptation for crisis and war

Innovation of new capabilities for security, resilience and defence is essential in times of crisis and war. Surprising development of an opponent's materiel, capability and impudence is almost unavoidable, as has been demonstrated in most modern conflicts. The war in Ukraine has been characterised by rapid, flexible and innovation-driven development of new measures and countermeasures, such as the use of drones or in the information war. Space technology in the form of satellite communications and satellite imaging has enabled a unique insight into the war, with direct application on the battlefield. Foreseeing all battlefield dynamics in advance will not be possible. Adaptation during conflict is crucial, which places great demand on the innovative capacity. The ability to quickly adapt routines, methods and tools – through both inventiveness and learning from other countries – has been an important part of Ukraine's defence efforts.

Sweden can apply the experiences from Ukraine to adapt working methods so as to permit varying degrees of risk in development and



procurement. It must be possible to abandon risk minimisation in times of peace in favour of pursuing forced development projects. An innovation system for increased defence capability has an important role to fill in all readiness situations.

Cyber soldier.

Photo: Bezav Mahmud/Swedish Armed Forces

To be able to drive change and development even during times of war requires preparation as regards culture, organisation and capacity production in times of peace. A method for systematically drawing on experiences from the battlefield and applying them in the innovation system needs to be developed. This work must build on a culture of continuous learning and dynamic capability. It must be possible to quickly translate experiences from military activities, exercises or war efforts into new functions, materiel and capabilities.

During ongoing modern conflicts, an effective, flexible and solution-oriented capacity for learning and innovation is a strategic advantage for the entire defence effort. Sweden's innovation system should be built during times of peace so as to accelerate development and production when the risk is greater. This would make it possible to match the tempo of the conflict and the opponent's battlefield adjustments, and thereby strengthen resilience.

Conclusions

- The innovation programme for civilian-military synergies is an important platform from which to continue to create conditions for collaboration and innovation between the civilian and defence sectors.
- In order to address new military and defence-related needs, it is essential to develop capability and working methods to quickly identify, adapt and employ civilian technological development in materiel supply.
- Defence innovation plays an essential role in all readiness situations.

Research and development of critical technologies and skills supply

In certain technological fields, defence agencies have a specific responsibility to develop and maintain expertise over time. This includes fields such as sensors, combat aircraft, electronic warfare, submarine technology, and weapons and protection engineering. By maintaining a high level of security in these fields, Sweden creates conditions for valuable international cooperation.

Research and development of critical technologies is usually conducted in specialised environments with safeguards for handling classified information. Defence agencies must have expertise to work with critical technologies and at the same time utilise civilian technological development for the needs of the Swedish Armed Forces.

Emerging and disruptive technologies that primarily developed in the civilian sector impact all critical technologies, as well as military capability, materiel supply and operational environments. It is therefore essential to be able to utilise technology developed in the civilian sector, e.g. open source products, in military systems. It is also important to develop new forms of collaboration between the defence and civilian sectors. However, the need to protect certain knowledge and technology under export controls must continue to be managed.

Submarine.

Photo: Rebecka Signäs/Swedish Armed Forces



Greater possibilities to utilise emerging and disruptive technologies for military applications

Emerging and disruptive technologies such as artificial intelligence (AI), additive manufacturing and space technology create both new opportunities and new threats. Monitoring and participating as a nation in developments in these fields is becoming increasingly important, from both a security perspective and a competitiveness perspective.

In the appropriation directions for 2024, the Government tasked the Swedish Defence Research Agency with establishing a group to study and advance emerging and disruptive technologies that benefit defence and security.

For this task, the Swedish Defence Research Agency will receive SEK 50 million in 2024 to advance, develop and test security- and defence-related applications based on emerging and disruptive technologies. This also addresses the need for research and development of critical emerging and disruptive technologies. The cost for subsequent years was estimated at SEK 75 million for 2025 and SEK 100 million for 2026. This is part of the proposal in the Budget Bill for 2024 to allocate SEK 100 million to the Swedish Defence Research Agency with the aim of strengthening research and analytical support for development of operational capability in Sweden's total defence. The proposal is to allocate an estimated SEK 143 million and SEK 189 million for 2025 and 2026 respectively.

This activity will be developed in collaboration with the Swedish Armed Forces and other relevant government agencies to achieve the greatest possible synergy effects with current and future activities. Collaboration will also take place with civilian actors, insofar as possible. This activity will be part of the Swedish innovation system.

Skills supply remains essential

To utilise emerging and disruptive technologies, new demands are placed on expertise and knowledge. On the whole, Sweden needs more people studying in higher education in the fields of science, technology, engineering and mathematics (STEM). Work to improve the skills supply from STEM educational programmes should be intensified. The Government intends to begin this work by developing a STEM strategy, which covers the entire education system from preschool to postgraduate studies and research.

In the Budget Bill for 2024, the Government proposed several different investments in education and research aimed at strengthening Sweden as an engineering nation and fulfilling the major need for expertise. The proposal includes expansion of civil engineering programmes and raising the compensation levels for educational programmes in science and technology. This investment in quality will comprise SEK 100 million in 2024, SEK 200 million in 2025 and SEK 305 million in 2026.

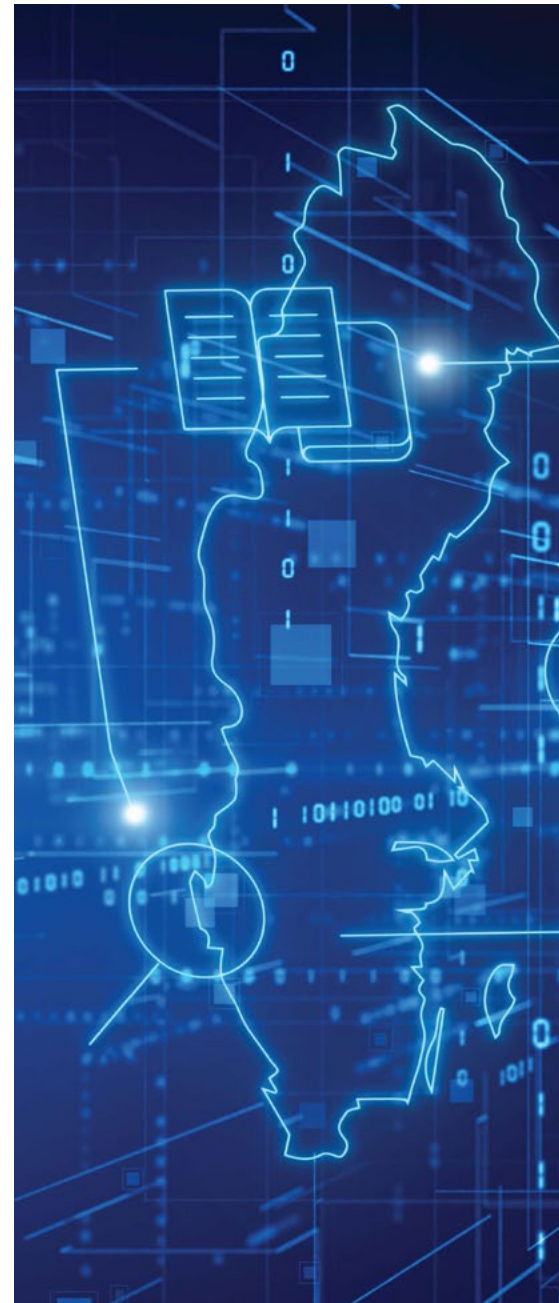


Illustration: Cybercampus Sweden



In light of the rapid technological development, possibilities for further education and training also need to be improved for those who have already completed an engineering programme. The Government therefore also proposed a broader investment of SEK 93 million in the budget for 2024 to permanently expand further education for professionals.

From a security and defence perspective, it is important to have a critical number of trained engineers and researchers who can be employed in the defence sector. This enables skills supply to employers, collaborative projects and staff mobility programmes that require security classification.

In the defence sector, it is important to develop military education programmes to stimulate long-term skills supply, including technical core competencies and opportunities to monitor knowledge development within new areas. This is also part of the long-term efforts to bring about cultural change in the defence sector. In addition, closer collaboration between government, industry and academia can contribute to strengthening the base of expertise and developing technological core competencies corresponding to priorities for defence.

The establishment of Cybercampus Sweden is a current example of how research, innovation and skills supply can take place through collaboration between various actors. In the Budget Bill for 2024, the Government proposed allocating SEK 25 million in 2024 to establish the new campus. Starting in 2025, an estimated SEK 40 million will be allocated per year.

Cybercampus Sweden will be a national format for cooperation between several universities, research institutions, government agencies and businesses across the country. The Royal Institute of Technology has a Centre for Cyber Defence and Information Security (CDIS), which joins together research and education in this field.

Cybercampus Sweden will significantly boost the skills supply of cyber security experts. This is absolutely essential to satisfy the demand in both civilian and military organisations.

Conclusions

- Research and development of critical technologies remains important for building military capability. In this context, the Swedish Defence Research Agency's new mandate to advance emerging and disruptive technologies for the benefit of defence and security plays an important role.
- Research and development of critical technologies will, as far as possible, serve as a basis for collaboration and be part of the innovation system's capability for defence innovation.
- The defence sector is dependent on society's collective expertise and skills supply thus becomes an essential prerequisite for defence innovation.

Capability needs and materiel development

Increased coordination and mature dialogue interfaces

As the Commission on Defence Acquisition (SOU 2022:24) noted, dialogue between central government and industry is an important prerequisite for materiel supply to function in the short and long term. Rapid technological development makes it difficult for an individual actor or sector to gain an overview of both capability needs and potential materiel projects that provide those needs.

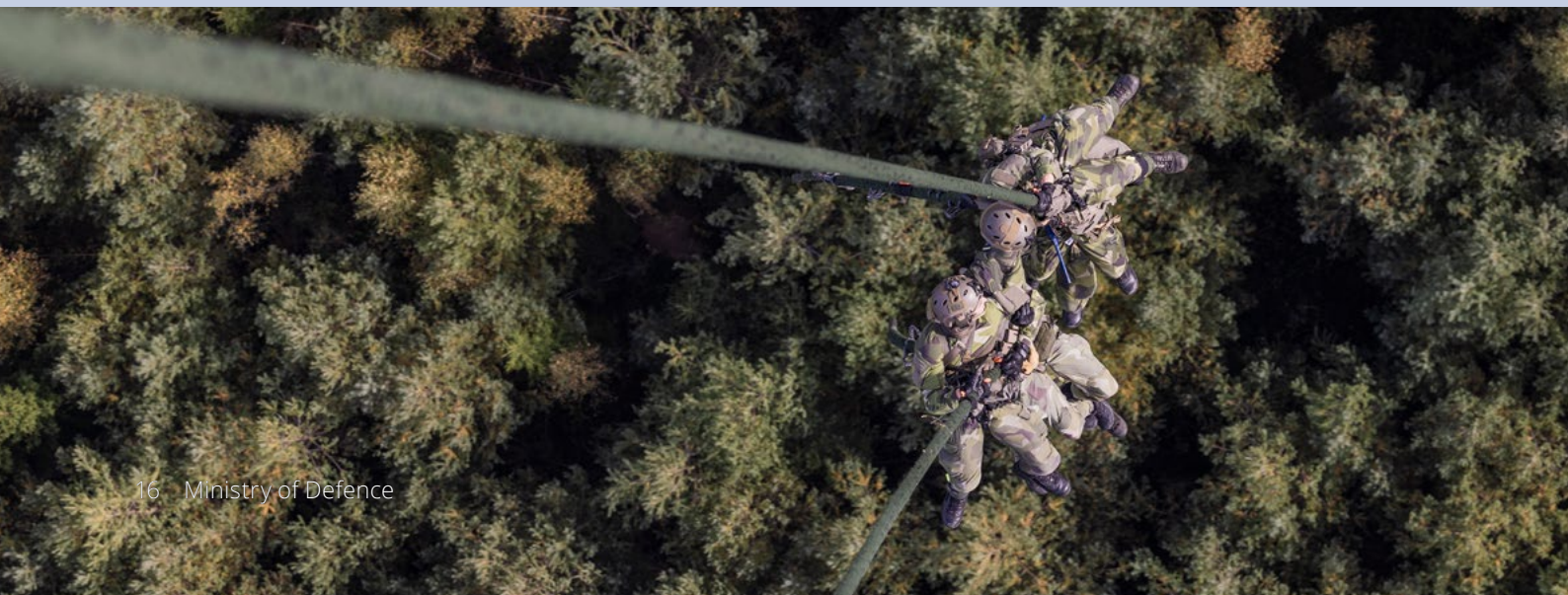
The dialogue between central government and industry has therefore become increasingly important and should be intensified. Coordination between procuring defence agencies should be further intensified. The currently available meeting formats associated with long-term capability needs and coordinated by the Swedish Armed Forces and the Defence Materiel Administration should, insofar as possible based on security considerations, include a broader range of businesses that operate in a civilian market. Increased collaboration would also provide greater opportunity for defence agencies to present military problems outside the traditional defence sector.

Cross-sectoral collaboration can also add to the ability to more quickly identify and adapt products developed in the civilian sector to fulfil military capability needs. By establishing more structured and deeper collaboration with industry, central government also creates conditions for quicker adaptability in times of crisis and war, something that has proved to be important for Ukraine in the current war. There is also good reason to assume that military requirements will stimulate innovation, including in the civilian area.

The new innovation programme for civilian-military synergies creates good conditions for a national overview of relevant businesses and organisations with potential to contribute to dialogues concerning capability needs, materiel development and new solutions.

Swedish Air Force Rangers.

Photo: Antonia Sehlstedt/Swedish Armed Forces



Mature procurement methods that promote innovation



Attack divers.

Photo: Antonia Sehlstedt/Swedish Armed Forces



JAS 39 Gripen taxiing at airport.

Photo: Mats Nyström/Swedish Armed Forces

Accelerating technological development creates opportunities that need to be identified and promoted by procuring government agencies. It is therefore necessary to develop working methods that enable use of public procurements as a strategic tool to link capability needs to new solutions based on emerging and disruptive technologies. One of several prerequisites for this is more civilian companies, including small and medium-sized enterprises, gaining access to the defence market. This requires a mature procurement process designed to gather knowledge and foster relevant technological development through dialogue with the supplier market. In this context, all available public procurement procedures should be considered, taking into account the capability needs identified with the aim of creating demand for innovations where solutions need to be further developed or are lacking altogether.

In the appropriation directions for 2024, the Government has tasked the Defence Materiel Administration with outlining what measures have been taken and what measures should be taken to promote defence innovation, and how the Defence Materiel Administration works with the Swedish Armed Forces, the Swedish Defence Research Agency and suppliers in this regard. Moreover, the Defence Materiel Administration will outline what measures it has taken to develop procurement methods that promote innovation and application of new technologies in procurement of defence materiel.

Working with innovation-promoting public procurement as a strategic tool is essential to addressing capability needs and securing a supply of materiel. The Government will follow up this issue with the Defence Materiel Administration and other relevant government agencies and external actors going forward.

Conclusions

- Accelerating technological development taking place largely outside the defence sector increases the need for agile collaboration with the part of the business sector that has predominantly been viewed as operating in a civilian market.
- Defence agencies' interfaces with the business sector and collaboration with civilian innovation and knowledge environments should be developed so as to promote collaboration and innovation.
- Innovation-promoting procurement methods should be developed in an expanded scope with the aim of managing accelerating technological development and a changing world.

International collaboration

New international defence innovation initiatives are constantly emerging. For Sweden, increased international cooperation on emerging and disruptive technologies with partner countries will benefit Swedish defence capability, research environments and Swedish security relations.

Sweden is now consolidating efforts at national level to provide conditions to take a proactive and leading role in international cooperation. Sweden is one of the most innovative countries in the world, and Swedish technological leadership must be safeguarded at national level and advanced through increased international collaboration.

Swedish defence companies are highly dependent on the international market. Exports account for just over half of their turnover. The share is even greater for small and medium-sized enterprises. An important segment of exports is due to international cooperation, e.g. where Sweden contributes components to jointly developed systems. This requires a great deal of trust between collaborating countries and good knowledge of export control regulations.

Due to the major costs of developing new systems, the number of international forms of cooperation is expected to grow so that more countries can share the burden and to combine various leading competencies.

Increased collaboration within the EU and NATO, and bilaterally

In the EU Strategic Compass for Security and Defence, one of the prioritised measures under the 'Invest' pillar is to boost defence technology innovation to fill strategic gaps and reduce technological and industrial dependencies.

Both the European Commission and the European Defence Agency (EDA) have launched a series of defence initiatives and programmes within the EU with the aim of promoting defence innovation. Examples of these are the European Defence Fund (EDF), the Permanent Structured Cooperation (PESCO), the European Defence Innovation Scheme (EUDIS) and the Hub for EU Defence Innovation (HEDI).

Within EU cooperation, Sweden has stressed the importance of focusing the initiatives and programmes under development on early phases of materiel development. Innovation, research and development are necessary focus areas to achieve qualitative improvement of the European defence industry base. It is in Sweden's interests that EU security and defence initiatives remain open for participation by third countries where relevant. Discussions about economic security and resilience will continue and Sweden must take part with the objectives of increased resilience and continued openness, as well as reduced vulnerabilities and risky dependencies vis-à-vis authoritarian states in particular.



Swedish units operating abroad.

Photo: Marcus Nilsson/Swedish Armed Forces

The Defence Innovation Accelerator of the North Atlantic (DIANA) is NATO's recently established platform for technological development and innovation. Through DIANA, innovative solutions from open environments are employed to solve military and defence-related challenges. The purpose is to quickly develop, test and apply emerging and disruptive technologies to improve defence capability and security. The NATO Innovation Fund (NIF) is a risk capital fund linked to DIANA that invests in startups and scaleups with defence potential.

The Government has decided that Sweden will, following accession to NATO, participate fully in the NIF if invited. It has been estimated that Swedish participation would entail a financial contribution totalling EUR 40 million for 15 years. This contribution will be added to the current capital of EUR 1 billion and thus increase the NIF's investable funds and promote the innovation capacity of the Alliance as a whole. This creates conditions for small and medium-sized enterprises in Sweden to participate in international cooperation formats. On instructions from the Government, the Swedish Armed Forces and Vinnova have presented a recommendation for a Swedish accelerator and four test centres that Sweden could nominate as nodes in the DIANA network following its accession to NATO.



The relevance of bilateral materiel, innovation and research cooperation beyond the EU and NATO has also increased. Sweden is working to develop relations with likeminded high-tech partner countries in the transatlantic area, Asia and other parts of the world.

Minister for Defence Pål Jonson at Nato Industry Forum.

Photo: Niklas Forsström/Government Offices of Sweden

Our bilateral relations contribute to the possibility of supplying materiel for military defence in an optimal way so as to meet future demands. Interest in defence innovation and strategic collaboration on technological development within bilateral forms of cooperation is growing constantly.

Maintaining and developing good bilateral relations, including through agreements (strategic partnerships and memorandums of understanding) on defence materiel, innovation and research that Sweden has entered into with other countries, enables active dialogue and collaboration characterised by trust that develop over time. Possibilities for Sweden to import what is needed and when necessary will thus increase, and at the same time Swedish businesses will be given an arena for exports and innovation cooperation.

Mature support for Swedish participation in international forms of cooperation

On instructions from the Government, the Swedish Defence Materiel Administration established a national coordinating office for the EDF that has been in operation since 1 January 2020. Its activities include holding annual information days to spread knowledge about the fund to Swedish businesses, government agencies, institutions and higher education.

Sweden is an active participant in EU initiatives such as the EDF and PESCO. This creates good conditions for collaborating with other Member States and benefitting from an exchange of experience. This, in turn, fosters innovative capacity and prospects for further EU cooperation for Sweden.

NATO membership gives Sweden the possibility to contribute to the Alliance's technological development and innovation together with other Allies. This will benefit not only NATO, but also the business sector and innovation environments in Sweden.

In light of the large number of upcoming international innovation initiatives that are relevant for defence, the Government has good reason to improve coordination between government agencies with the aim of encouraging participation by both defence companies and companies that operate primarily in a civilian market. The same applies to structures for dialogue between the Government Offices, government agencies and the business sector on issues concerning how programme forms can be developed most effectively. There is also potential in developing approaches at the Swedish missions abroad so as to promote international cooperation on defence innovation. This requires deepened collaboration on defence innovation issues between innovation and research committees, defence committees and defence attachés.

Conclusions

- The number of international forms of cooperation is expected to increase, which could benefit Swedish defence capability and strengthen security relations. It is essential that Sweden participates on a broad scale.
- Strategic bilateral forms of cooperation must be further developed.
- Enhanced coordination and cooperation at national level are necessary for ensuring active Swedish participation in the various international initiatives and programmes that are expected. This is important for providing small and medium-sized enterprises conditions to participate in international forms of cooperation.
- Enhanced coordination at national level is necessary to proactively drive influence activity at an early stage, with new proposals for initiatives and programmes in formats such as the EU.



Training of rangers and reinforcement soldiers.

Photo: Mats Nyström/Swedish Armed Forces

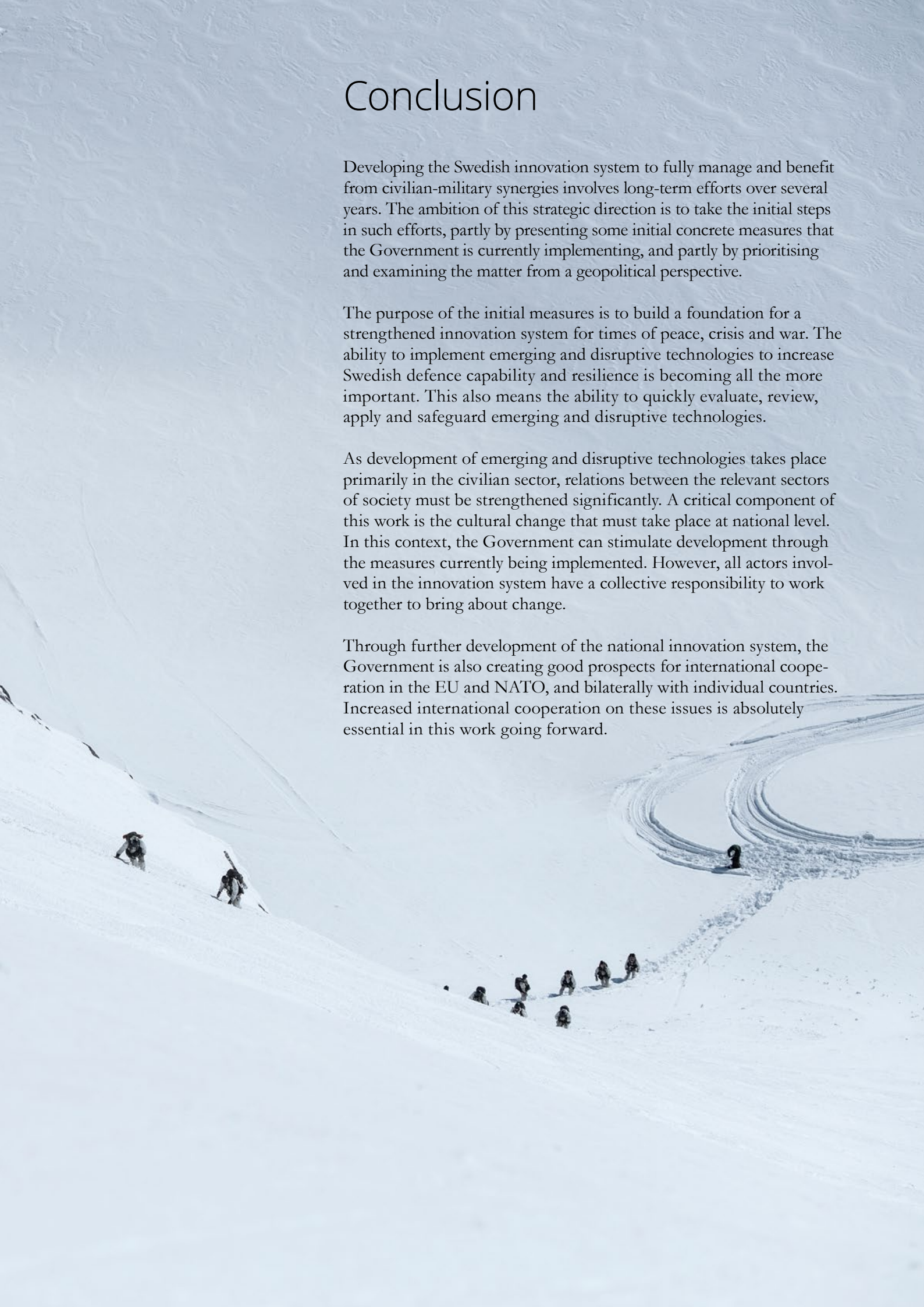
Conclusion

Developing the Swedish innovation system to fully manage and benefit from civilian-military synergies involves long-term efforts over several years. The ambition of this strategic direction is to take the initial steps in such efforts, partly by presenting some initial concrete measures that the Government is currently implementing, and partly by prioritising and examining the matter from a geopolitical perspective.

The purpose of the initial measures is to build a foundation for a strengthened innovation system for times of peace, crisis and war. The ability to implement emerging and disruptive technologies to increase Swedish defence capability and resilience is becoming all the more important. This also means the ability to quickly evaluate, review, apply and safeguard emerging and disruptive technologies.

As development of emerging and disruptive technologies takes place primarily in the civilian sector, relations between the relevant sectors of society must be strengthened significantly. A critical component of this work is the cultural change that must take place at national level. In this context, the Government can stimulate development through the measures currently being implemented. However, all actors involved in the innovation system have a collective responsibility to work together to bring about change.

Through further development of the national innovation system, the Government is also creating good prospects for international cooperation in the EU and NATO, and bilaterally with individual countries. Increased international cooperation on these issues is absolutely essential in this work going forward.



Government Offices of Sweden

Ministry of Defence

Switchboard: +46 8 405 10 00

www.government.se



Read more about the Strategic
Direction for Defence Innovation
at government.se/defenceinnovation