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# National Defence Industrial Strategy of the Danish Government

**Strengthened cooperation for Danish security**

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Ministry of Industry, Business and Financial Affairs, Ministry of Defence, Ministry of Foreign Affairs,  
Ministry of Higher Education and Science

The cover shows the Danish Armed Forces' first satellite orbiting the earth.

This nanosatellite, measuring 30 x 20 x 10 centimetres and weighing 8 kg, is an innovative Danish product that was further developed and tested in close cooperation involving the Danish Armed Forces, the research sector and the Danish defence industry.

This type of satellite is a sustainable, cost-effective equipment platform that can contribute to providing a general view of the Arctic and supporting the Danish Armed Forces' task performance, such as rescues at sea. Another purpose of the satellite is to help enhance security and safety and to support Denmark's essential security interests.

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Danish defence industry is  
one of several layers in the  
foundation for Danish security

# Foreword

Complex new threats put pressure on Denmark's national security and safety. The threat landscape has changed and become more unpredictable – from the Baltic Sea to the Arctic, from cyberspace to the race to develop new technology and control supply chains. The new threats and rapid technological developments give rise to not only rigorous new requirements for the protection of Denmark's essential security interests and military capabilities, but for Denmark's national defence industry as well. The Government recognises the part that the Danish defence industry plays in the protection of our national security interests and aims to strengthen the collaboration with this strategy. This is an essential component of the Government's overarching national and international security policy initiative aimed at strengthening Denmark's security.

The Danish defence industry is essential for Denmark's national security and for our joint efforts with allies and partners. The defence industry is instrumental in ensuring that Denmark's authorities and operational units have the right tools for responding to threats against Denmark. Abroad, Denmark's defence companies are attractive business partners, as their solutions boost Denmark's military cooperation with our allies and partners. The defence industry holds key resources for our security and safety. At the same time, the defence industry takes part in international supply chains, giving Denmark access to important partners and markets.

Internationally, transatlantic and European initiatives are being launched to lay the industrial foundation for defence collaboration through which common threats can be addressed. Denmark's security depends on strong partnerships and alliances with other countries, but Denmark's sovereignty and independence are ultimately our own responsibility. Accordingly, Denmark must maintain and develop competitive industrial competences and capabilities in areas of strategic importance for the protection of Denmark's essential security interests.

For the benefit of our national security, the Government gives priority to equipping the defence industry with the tools to engage with developments

within the area. In dialogue with the national defence industry, the Government has selected seven action areas aimed at strengthening the Danish defence industry now and in the future, to enable the industry to continue its strong contribution to the protection of Denmark's essential security interests.

The action areas will enhance collaboration and strengthen the framework conditions for the defence industry. They will strengthen access to international supply chains and markets and bridge the gaps between research, development and utilisation in selected areas. In addition, the actions will ensure a sustainable, modern technological focus – among Denmark's regulatory entities and within the defence industry.

The strategy must support the aim to give Denmark a bigger, stronger and more sustainable Danish defence industry. This will be instrumental in ensuring that Denmark can protect its essential security interests. In addition, it will create growth and jobs throughout Denmark. With this strategy, the Government is appraising the value of the industry's strategic role for Denmark's security and presenting a reinforced framework to further promote the industry. At the same time, the Government expects the Danish defence industry to be conscious of its social responsibility, in line with other industries, and to share responsibility for general societal development – technologically, socially and environmentally.

*Minister for Industry, Business and Financial Affairs,  
Simon Kollerup*

*Minister of Defence,  
Trine Bramsen*

*Minister for Foreign Affairs,  
Jeppe Kofod*

*Minister for the Ministry of Higher Education  
and Science,  
Ane Halsboe-Jørgensen*

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The Government will maintain and develop industrial competencies and capabilities within areas of significant importance for Denmark's national security interests

# Introduction

Denmark is dependent on having military equipment to protect Denmark. Supplies from the defence industry – in Denmark and abroad – are crucial for the protection of Denmark's essential security interests. Now and in the future.

This requires us to make a continuous effort to enhance our ability to adapt to changes to the threat landscape and technological developments. This applies to both our operational and our industrial adaptability, as the Danish defence industry constitutes one of several layers in the foundation of Denmark's national security. The Danish defence industry plays an important role in ensuring that our operational entities have the right tools to maintain the safety and security of the Danish population.

At the same time, the defence industry helps strengthen our collective defence by exporting its products to our allies. A good example is the development of the F-35 fighter jet: Danish defence companies have been assisting in the development and production of this fifth-generation fighter aircraft for decades. It is also exemplified by Danish companies that are involved in European consortia through the European Defence Fund (EDF). The defence industry's exports and international industrial cooperation projects boost our collective defence, create interdependencies and reinforce the groundwork for receiving support from allies if Denmark's national security is threatened. Finally, the collaboration between authorities and the industry in the area of national defence is essential for Denmark's security of supply. The Covid-19 pandemic has underlined the importance of being in control of national supplies of critical resources. This is particularly important in the area of defence. In times of crisis, Denmark cannot rely on other countries to place critical industrial capabilities at the disposal of Danish forces before the needs of their own national defence systems are met.

Today, Denmark faces a new threat landscape, with a complexity and rate of change which are amplified by technological developments. In this context, the defence industry and Denmark's research institutions are also crucial partners for ensuring the conversion of new knowledge and green and technological possibilities for the benefit of Denmark's

national security by developing new solutions in the area of defence. Close collaboration involving Danish authorities, the Danish defence industry and Denmark's research institutions is crucial to ensure our ability to keep up with developments.

Rising defence budgets at international level constitute an opportunity to consolidate strategically important expertise within Denmark's industrial base. The Danish defence industry depends on export markets, as national demand is insufficient to support a viable Danish defence industry. The international market for defence equipment is characterised by national barriers to trade, however, which make it difficult for Danish undertakings to compete on export markets. Specifically, this requires us to support the Danish defence industry in order to build up an appropriate national, defence-industry base.

Accordingly, the Government has renewed its focus on the defence industry in Denmark and has developed this strategy for the Danish defence industry. The strategy aims to maintain and develop competitive industrial expertise and capabilities in areas of strategic importance for the protection of Denmark's essential security interests. It must support strong, modern armed forces in a more unpredictable reality in terms of security policy.

The strategy is made up of six sections, starting with an introduction of Denmark's essential security interests of particular significance for the development of the Danish defence industry. This is followed by a presentation of the Ministry of Defence's approach to research, development and acquisitions of equipment. After this, the Danish defence industry's characteristics and development potential are outlined, including the competitive conditions under which the industry operates. Finally, the areas of technological priority are laid out, followed by a presentation of seven action areas designed to promote strategically crucial expertise within the Danish defence industry. Tasks arising from the seven action areas of the strategy will be carried out in cooperation with representatives from across the authorities, industry and research institutions.

# The Defence Industry and Denmark's National Security

The Government's forthcoming Foreign and Security Policy Strategy defines the framework for Denmark's essential security interests. These security interests are safeguarded through a range of measures, including by cooperating with the Danish defence industry and by implementing this strategy for the Danish defence industry. Thus, the Danish defence industry constitutes one of several layers in the foundation for Danish security.

## **NATO, the USA and international collaboration**

Denmark's national security relies on binding alliances with other countries, both operationally and in terms of defence-industry initiatives. The Danish defence industry develops tools that are used to counter threats to Denmark, our allies and partners. Joint industrial solutions support Denmark's military interaction with allies and partners and consolidate the basis for supporting allies and partners if Denmark is threatened. The Government prioritises close defence-industry collaboration with Denmark's most important allies and partners. The Danish defence-industry base must support Denmark's ability to enter into international defence cooperation.

## **The Arctic and the North Atlantic**

The situation in the Arctic and the North Atlantic is changing. Climate change and the geopolitical situation have led to an increased presence and activity of various countries in these regions.. This affects our national security, including the Danish Armed Forces' important undertaking of civilian tasks in the Arctic. Here, too, the defence industry has an important part to play. Due to the Arctic's unique topographical and climatic conditions, we cannot rely on the international defence-industry market to be fully capable of supplying equipment to meet

these specialised needs. For this reason, the Government prioritises Denmark's ability to maintain and develop national defence-industry expertise and capabilities that can be used to perform tasks in the Arctic.

## **Security of supply**

The Covid-19 pandemic has underlined the need for national security of supply. This is essential in the defence industry sphere, where the ability to keep Denmark's armed forces battle-ready during a crisis may depend on the Danish defence industry. Although Denmark is dependent on foreign defence equipment, the Danish defence industry must be able to use equipment within selected areas, where Denmark has unique national needs. In other areas, Denmark needs to have close ties with foreign suppliers and ensure foreign interest in maintaining supplies to Denmark. Accordingly, the Government gives priority to maintaining and developing national defence-industry expertise in selected areas and reducing the risk of disruptions of supply from abroad.

## **Digitisation and cybersecurity**

Denmark is one of the most digitised societies in the world. Many critical sectors in Denmark are digitised and essential for ensuring the functioning of society. This explains why cyberattacks are particularly threatening to Denmark. For the Government, it is a priority that Denmark preserves and develops national cyber expertise capable of protecting Danish society and the Danish defence industry against external attacks. This can be done by building up cybersecurity for platforms and weapon systems in the Danish Armed Forces and by identifying the scope for independent capabilities in the areas of encrypted communications, advanced





cybersecurity, etc. In addition, the Government prioritises providing scope for collaboration with companies regarding disruptive technologies, including artificial intelligence.

#### **Total defence**

The combined military response – total defence – must ensure the coordinated use of all of society's resources, both military and civilian, in the event of national crises, disasters or war. A country the size of Denmark needs to have military equipment platforms that can also be deployed to meet civilian needs. For instance, entities in the defence sphere perform tasks in the areas of snow removal, rescues at sea and fisheries inspection. Particularly in

Greenland, civil society frequently depends on military equipment platforms for conducting searches, responding to environmental disasters and performing unique assignments, such as the roll-out of a vaccination programme for local communities. Accordingly, the Government prioritises the wide integration of the capability of military equipment platforms into Denmark's total defence. In this context, it is essential for the Danish defence industry to build up technological expertise that can be utilised across both civilian and military domains.





## The Maritime Industry and Denmark's essential security interests

Denmark stands out on the maritime world map as a leading seafaring nation. At the same time, the defence and security of Denmark's maritime industry are crucial for Denmark's national security – both operationally and industrially.

Denmark must be capable of controlling straits and sounds so that we can assert our sovereignty and ensure that our allies can access Danish territory by sea. Seventy per cent of Danish imports are conveyed by sea, which includes supplies of medicine, food and other critical resources that must be maintained without disruption. Conflicts in our neighbouring areas may require the establishment of transportation routes in the Baltic Sea for our allies. NATO regards Denmark's land-based territory as a deployment and transit area. In this context, the establishment of local maritime supremacy, including the securing of fairways around our recipient ports, is crucial to ensure that supplies and reinforcements can access Denmark by sea.

Together, Denmark, Greenland and the Faroe Islands have the fourth longest coastline in the world. This imposes specific requirements for the vessels of the Royal Danish Navy which perform a range of national tasks. The geography, climate and coastline call for specially equipped, specialised and adapted maritime solutions. The Danish Navy's vessels must be able to cope with extreme conditions and must be adaptable for performing both military and civilian tasks. This gives rise to special requirements for technical expertise in the areas of design, construction and maintenance in the Danish defence industry.

Denmark operates the fifth-largest merchant fleet in the world. Denmark must be capable of

protecting essential security interests relating to Denmark's merchant fleet. We must have the capability to protect our civilian vessels against hostile acts by governmental and non-governmental operators, both in our own territorial waters and far from Danish shores. In the event of a crisis or war, the merchant marine can be deployed to convey equipment, supplies and war material to conflict areas, a capacity that is significant for Denmark, our allies and our partners. The Government prioritises the reinforcement of maritime security for commercial shipping in vulnerable areas, which imposes demands on Denmark's naval capabilities. It also requires Denmark to have a maritime industry that is capable of responding to operational needs in the area of national defence.

Danish shipyards have been delivering, equipping and maintaining the Danish Navy's vessels for years. This collaboration between shipyards and the Danish Navy has constituted one of several layers in the foundation of Denmark's national security and has supported the Danish Armed Forces' need for specialised expertise and capabilities for deployment in national and international operations and in the Arctic. The maritime industry's ability to supply the Danish Armed Forces now and in the future is closely related to the Danish Armed Forces' approach to future maritime acquisitions. Maintaining this expertise requires ongoing efforts in order for the Danish defence industry to be able to maintain an effective role as a supplier to the Danish Armed Forces. This explains why it is crucial to safeguard critical national maritime expertise to ensure we increase our security of supply and reduce our reliance on foreign maritime supplies.

# Acquisition Policy of the Ministry of Defence

To ensure the operational ability to perform tasks in the area of national defence now and in the future, defence and security-related acquisitions are made on an ongoing basis. This encompasses everything from small local purchases to large-scale acquisitions of equipment such as ships, aircraft and helicopters, as well as armoured vehicles and other weapon systems.

Most of the major defence-related acquisitions of equipment are undertaken on the international market through international systems suppliers. The international defence industry often delivers complete weapon systems and technologies that are necessary for ensuring that the Danish Armed Forces in particular have the required combat capability and that our equipment is compatible with that of our allies.



## Triple-helix collaboration in the drone sector



Developments within the area of drones require the Ministry of Defence's acquisition process to be speedy and flexible. This is partly due to fast-paced technological developments in the field, but also because small commercial drones have become easily accessible and are increasingly being used in conflicts with significant effect. The rapid developments in the area make drones a growing threat to Denmark's national security. This makes it critical for the Ministry of Defence, the industry and research institutions to cooperate closely, particularly for being able to acquire appropriate countermeasures.

For instance, the Danish Armed Forces are already involved in a triple-helix collaboration in the drone sector where research, industry and the state join forces. This is taking place via UAS Denmark's testing centre at the Hans Christian Andersen Airport. UAS Denmark is a partnership involving the City of Odense, the University of Southern Denmark, Udvikling Fyn and the Hans Christian Andersen Airport on the Funen. The Danish Armed Forces are collaborating with UAS Denmark by sharing experience, sitting on UAS Denmark's advisory board and utilising the capability made available by UAS Denmark. There is scope for enhanced collaboration in development, testing and knowledge-sharing activities. The lessons learnt from the collaboration can be gathered and disseminated to other relevant areas. The drone sector is generally an area where close collaboration between relevant operators can serve as a platform on which to explore the possibility of innovative acquisition processes.

Denmark has only a few systems suppliers capable of delivering complete systems to end-customers in the military sector. Therefore, as a general rule, it is the expectation that foreign suppliers will continue to serve as systems suppliers.

For defence equipment procurements, Denmark distinctly benefits from acquiring equipment and systems that are as compatible as possible with those of our close allies. First, this paves the way for cooperating with our allies on acquisitions, operation, maintenance, training and education. Second, it makes it possible to draw on our allies' maintenance capacity and equipment reserves during international operations. Third, it becomes more profitable for the industry to develop and improve materials and systems when the number of users increases. Finally, it makes it possible for Denmark to obtain a military capability that Denmark itself does not possess, such as having access to secure, operational, satellite-based communication.

For acquisitions on the international market, it is a priority that Danish defence companies have access to enter into strategic defence-industry supply chains.

The development in the threat landscape and technological trends are significant to Denmark's operational needs. However, the acquisition policy of the Ministry of Defence can be used to effectively counteract these trends in cooperation with the Danish defence industry.

## Modernising acquisitions at the Ministry of Defence

The Government will focus on the following areas in relation to Ministry of Defence acquisitions: speed, flexibility, transparency and enhanced triple-helix collaboration involving industry, research and authorities, as well as focusing on innovation by cooperating with small and medium-sized enterprises.

### Speed and flexibility

Keeping up with developments calls for a heightened awareness of speed and flexibility in the Ministry of Defence's acquisition policy. The Ministry of Defence's overarching acquisition policy for buying 'off-the-shelf items' aligns with the objective of adaptability and acquiring the latest and best equipment on the market. In the future, some types of equipment, systems and services will require rapid development and continuous improvement. Accordingly, the Government will work to develop more flexible acquisition and development methods to supplement the traditional acquisition processes. This is particularly important for the segment of the industry with the fastest pace of development.

### Collaboration and bridge-building

The Government will also work to improve the transparency of the Ministry of Defence's acquisition needs and plans, to make future acquisitions more predictable and manageable. This is why major, anticipated investments in equipment and equipment-related operational tasks will be announced publicly to provide the industry with an overview of forthcoming equipment-related initiatives and give the industry better conditions for planning production and development.

### Predictability and transparency

The Government will strengthen the interaction of the Ministry of Defence with the Danish defence industry and research institutions to address future operational needs. The complexity of new technologies makes new demands for cooperation and dialogue. The operational needs define the demand for defence equipment, but the defence industry's technological insight can provide innovative new solutions to meet operational needs in new ways. This is also true of Denmark's research institutions, which have a wider perspective and are at the leading edge of technological knowledge in a number of areas of military technology. In this context, it may be more valuable to involve relevant industry and research players earlier in the acquisition process – possibly in the initial phases when operational needs are being defined, but before specifications and requirement have been finalised.

### SME's and innovation

Finally, the Government sees a need to focus on the potential for innovation found in small and medium-sized enterprises and research environments. This applies to both the traditional defence industry and the spin-in segment of civilian high-tech companies whose commercial technology can potentially improve traditional defence-industry solutions. Small and medium-sized enterprises have good prerequisites for bringing new technologies to market and disrupting existing solutions. A number of small Danish defence enterprises were originally incubated in Denmark's university environments. It is important for the Ministry of Defence to be present and support these types of knowledge and development environments. The Danish Armed Forces are already involved in the area, as exemplified by a triple-helix collaboration project in the drone sector involving industry, research and authorities, where the lessons learnt can lay the groundwork for new collaboration projects. It can also be beneficial to draw on the lessons learnt from collaborating with the Danish defence industry via the co-financing fund under the Danish Ministry of Defence Acquisition and Logistics Organisation.







## Intensified climate effort by the Ministry of Defence

The climate crisis is one of the biggest global challenges of our time and requires action here and now. Denmark must lead the way by setting a green example, which also includes the area of defence.

This is why the Government has created a 14th climate partnership in the defence area. The task of the climate partnership is to chart the specific climate-friendly solutions currently being developed in the area of defence and to create a spill-over effect so that innovative civilian solutions can be applied to the remit of the Ministry of Defence. This is exemplified by alternatives to fossil fuels and Power-to-X solutions.

If green technological solutions can eventually be integrated into the capabilities of the Ministry of Defence, this will benefit not only the climate but also the task performance of the Ministry of Defence. The development of new technologies can help reduce the reliance of the Danish Armed Forces on traditional sources of energy and provide greater scope of action in its operations.

Lessons learnt from Afghanistan show that it can take roughly 12 litres of petrol to convey one litre of petrol to a mission base in Afghanistan. All other factors being equal, this heightens the vulnerability of the supply chain – and thus that of the soldiers. The efforts of the Ministry of Defence to green its organisation can therefore go hand-in-glove with operational considerations. Also, a green effort in the Ministry of Defence's area can eventually become an operational advantage for the benefit of the soldiers' safety.

A climate partnership can make Denmark into a pioneering country by showing how green solutions can be used operationally in the area of defence and support the Danish defence industry's green export potential in the rest of the world.

NATO and other international organisations express great interest in reducing carbon emissions from military activities and establishments. The US administration has announced that addressing climate change must be a key element of America's national defence and security policy. In the European Union, there is a strong movement towards green transition, including through the European Defence Fund, which, inter alia, focuses on green technologies in the European defence industry. The Danish Armed Forces can pursue these trends to 'showcase' the use of green technologies in operational environments and strengthen the Danish defence industry and the green transition.

The Danish Armed Forces are already engaged in the green transition and for years have focused on reducing the consumption of energy, both the carbon emissions of equipment platforms by using simulation equipment and at establishment areas where barracks are being environmentally optimised and made more energy efficient. These efforts are being further strengthened in the Ministry of Defence's 'Green Action Plan 2021–2025' aimed at supporting the Government's ambition to reduce carbon emissions by 70% by 2030.

As the state's biggest procurement organisation, the Ministry of Defence is particularly well placed to influence the green agenda. This is why the Danish Ministry of Defence Acquisition and Logistics Organisation is in the process of implementing the Government's strategy 'Green Procurement for a Green Future'. The purpose of the strategy is to drastically reduce the climate footprint of public procurement and to help achieve Denmark's climate targets.

In the long term, existing and new green technologies will pave the way for greener and stronger Armed Forces.

# The Defence Industry in Denmark

The Danish defence industry is a strategically important sector.

The defence industry constitutes one of several layers in the overall foundation of Denmark's national security. The Danish defence industry assists in providing the area of defence with the right capabilities and expertise to counter threats against Denmark. The Danish defence industry strengthens the European and American defence industries, where Danish companies help address shared international challenges. The exports and international industrial cooperation of the defence industry create interdependencies and reinforce the basis for receiving support from allies in the event that Denmark's national security or sovereignty is threatened.

In Denmark, more than 200 companies are deemed to be part of a defence industry that designs, develops, manufactures, services and/or further develops products and systems for military use. This includes companies supplying dual-use products and civilian companies whose products or services are included as part of a defence-industry final delivery. Denmark has only a few system suppliers who supply complete systems to end-customers in the military sector. The industry primarily comprises specialised subcontractors in high-tech sectors and component suppliers who supply high-quality individual components.

Denmark's defence industrial companies are respected abroad and typically supply high-tech products and subsidiary systems to international supply chains. Out of the industry's total annual revenue of DKK 3–4 billion, roughly 80% is generated by exports, and Danish companies are involved in international supply chains, which enhances the industrial interdependence between Denmark and our allies. The US is the biggest, most important export market for the Danish defence industry. In addition, exports to the EU also constitute a key market. In many markets, new possibilities for the

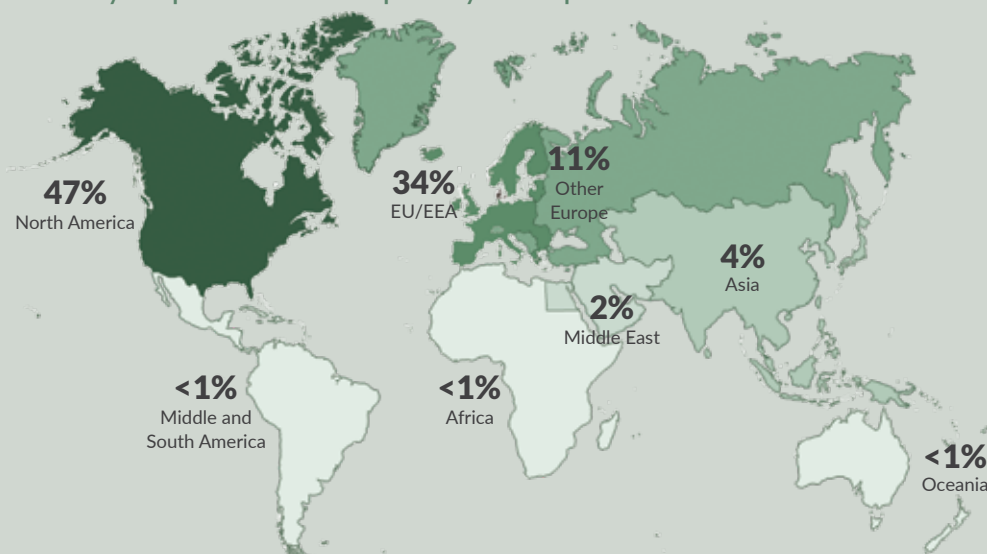
Danish defence industry are emerging concurrent with rising defence budgets and the creation of new international defence-industry development programmes. The Danish defence industry must be put in a position to exploit this to strengthen the industrial interdependencies for the benefit of Denmark's national security.

The Danish defence industry is completely privately owned and operates on commercial terms, which is quite exceptional internationally, where national defence industries are frequently owned, controlled or subsidised by the state. The Danish industry navigates according to national defence-policy agreements and acquisition plans, which is why it is affected by political priorities in the area, but always according to the arm's-length principle. This enhances the industry's innovative capacity and competitiveness. At the same time, it imposes special demands for close dialogue and cooperation between Danish defence-industry companies and the authorities.

The framework conditions in the defence industry are unique. The framework stipulates a number of special security requirements that are reflected in production permits, export control rules and regulation as well as security clearances. At the same time, the defence industry operates within a specific framework governed by procurement law, the purpose of which is to strike a balance between a competitive market and initiatives aimed at maintaining and developing a national defence-industry base in keeping with Denmark's essential security interests. These framework conditions are essential for Denmark's national security and international security in general and are adapted to international standards which are continuously being developed. Concurrent with the development of Danish and international framework conditions, it is important to ensure that these continue to be coherent and transparent and that they are supported by efficient administration.

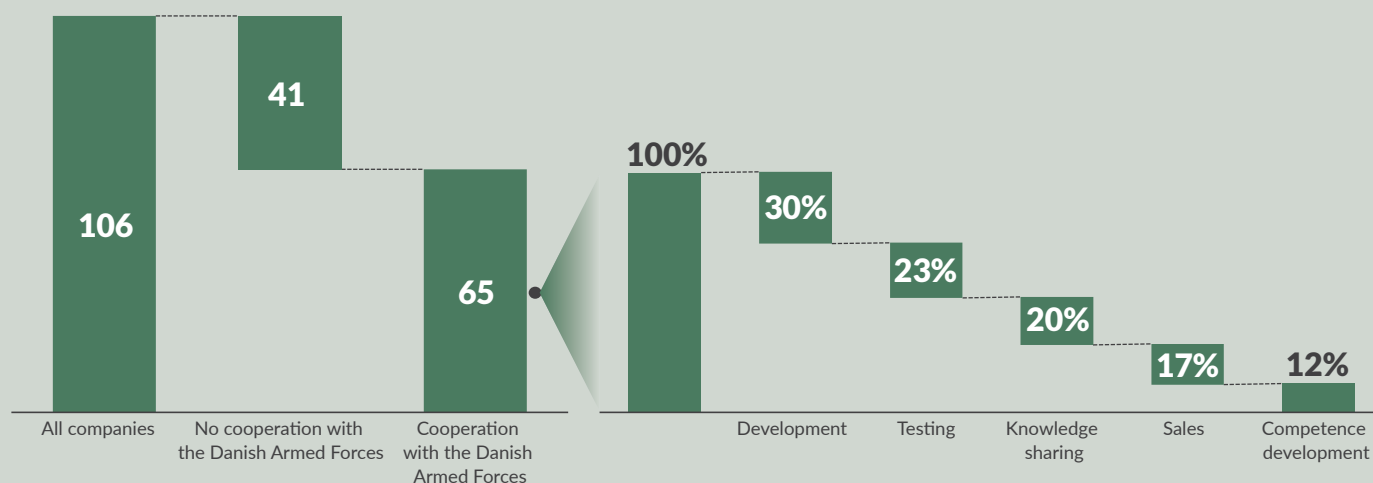


The Danish defence industry is export orientated and primarily sells its products and services in North America and the EU

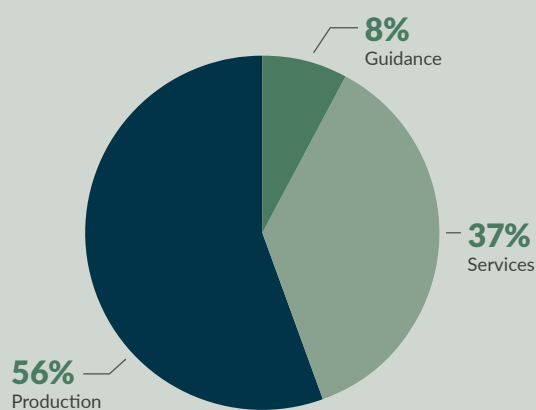


Average distribution of Danish defence industrial export for the period 2009-2019.

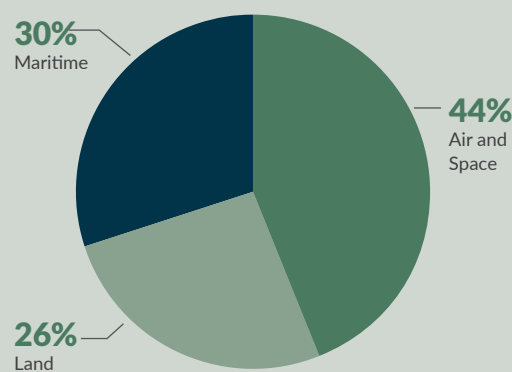
A significant segment of the Danish defence industry cooperates with the Danish Armed Forces on development and testing



The Danish defence industry primarily operates within production...



... and within the 'air and space' sphere



Source 1: Internal analysis by the Ministry of Defence based on data from the Department of Justice, 2021

Source 2: Internal analysis by the Ministry of Defence, 2020

Source 3: Data provided to the Department of Defence by Confederation of Danish Industry (FAD) in 2019 (data from 2017).

## The Danish defence industry supports Denmark's national security in a number of areas



### Operational task performance.

The industry assists in operational task performance by supplying the products and systems required for the Danish Armed Forces' combat capability and task performance in particular. The Danish defence industry supplies products and services directly to the Danish Armed Forces in a number of areas, such as maritime capabilities, command and control systems, radar technology, self-protection solutions, armour, simulators, information security, etc. In addition, Danish companies serve as important sub-suppliers to foreign system suppliers' deliveries to the Danish Armed Forces.



### Equipment maintenance.

Units under the remit of the Ministry of Defence maintain military preparedness for conducting national and international tasks and must be capable of reacting at short notice under all conditions and circumstances. This requires equipment and capabilities to be operational and ready for deployment at any time. Danish companies provide products and services in the areas of development, installation, supply, operation and maintenance on a number of equipment platforms, such as armoured personnel carriers. They do this either through direct supplies to the Danish Armed Forces or as external suppliers of foreign systems contractors.



### Denmark as a trustworthy, attractive ally and partner.

As part of the Western industrial base, Danish companies enhance Denmark's position as an attractive, trustworthy ally by taking part in international supply chains in the defence equipment market. With an export share of up to 80% of turnover, the industry is integrated into international supply chains, which helps ensure industrial interdependence between Denmark and our allies. The Danish defence industry supplies products and systems to our NATO partners and takes part in international consortia by supplying critical components and subsidiary systems. Examples include Denmark's new fighter aircraft and new surface-to-air missiles for the Royal Danish Navy.



### Technological insight and innovative force.

Denmark's ability to identify and counter new threats is continuously supported by Danish companies which contribute insight and innovation within defence-related and civilian areas of technology. The generally intensifying technological complexity in both society and the area of defence increases the industry's need to draw on high-tech expertise.

Export control is a key framework condition for the defence industry and an integral part of the Government's strategy. It is important for the Government to ensure appropriate control with Danish companies' exports of military technology and equipment and of dual-use products in order to ensure that this type of equipment complies with the EU's common rules governing control of exports of military technology and equipment. Denmark applies a restrictive policy based on a case-by-case assessment of license applications in accordance with the EU's common rules. At the same time, the Government places importance on ensuring that Danish companies are not placed at a disadvantage compared to European competitors, which is why the Government continuously strives to achieve enhanced coordination and harmonisation in the implementation of the common rules within the EU.

The companies in the sector are widely dispersed throughout Denmark and contribute jobs and welfare to local communities, for machinists and engineers alike. The geographical dispersion also contributes to Denmark's national security, as strategic

defence expertise is locally available at several sites in Denmark.

The companies in the defence industry also contribute to the wider society which they are part of. This is exemplified by apprenticeships and traineeships for young people and the employing of veterans. In common with other sectors, the defence industry must take social responsibility both in Denmark and abroad. The Government will continue to focus on ensuring that our veterans have good conditions on the labour market via the Ministry of Defence's action plan for veterans where having good working relationships with Danish defence industrial companies is crucial.

In the strategy, the Government takes account of the Danish defence industry's unique characteristics and gives priority to reinforcing the framework for innovation, internationalisation and collaboration in the defence sphere to give Danish companies better access to end-customers and markets. For this purpose, the Government will focus on continuing to uphold efficient and transparent administration in the area.

### A defence industry on the move

A number of significant macro-tendencies are driving developments in the defence-industrial area.

In the future, the boundaries between defence companies, dual-use companies and non-military, high-tech companies will become more fluid. Over time, new areas will take on security-policy significance, and the military relevance of civilian technologies will increase. The EU has also brought focus to bear on these new dynamics by virtue of the Commission's Action Plan for Synergies between Civil, Defence and Space Industries. The plan focuses on spin-in and spin-off opportunities

cutting across traditional sector boundaries. This is why it makes sense to be at the leading edge together with the companies that are at the forefront of current developments – also within the traditional defence-industry sphere. Denmark has world-class civilian-sector companies in areas such as digitisation, life sciences, audio, green technology, energy storage, etc., and Denmark also has an industrial position of strength in the fields of robotics, automation and drones. Intensifying cooperation across traditional sector boundaries provides new opportunities to exploit positions of strength in Denmark's civilian industries for the benefit of Denmark's national security.



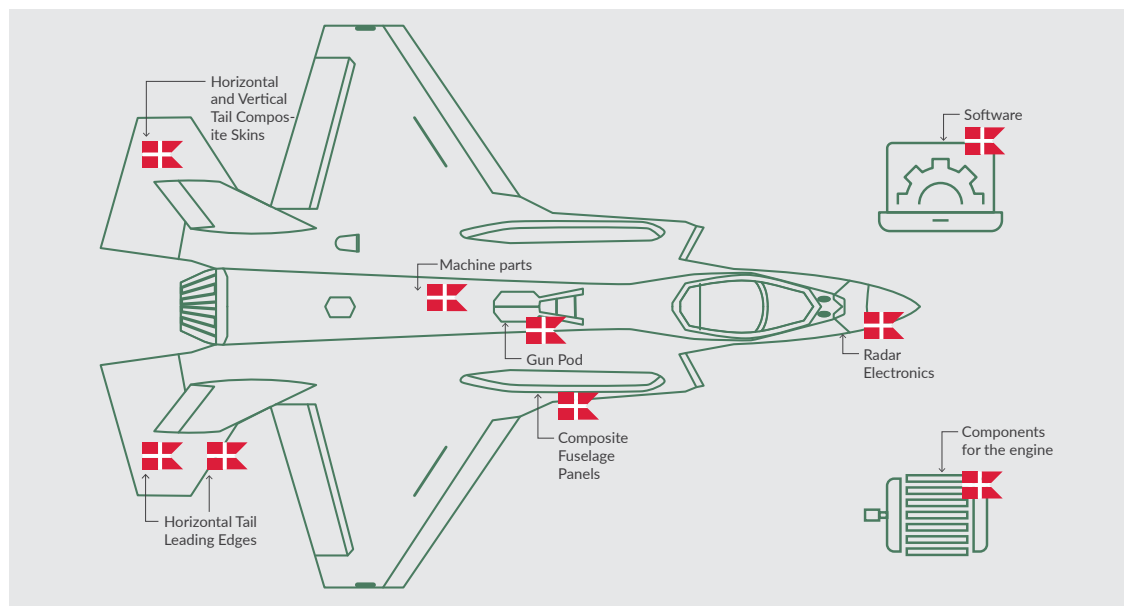
Figure 1

**Since Denmark's entry in to the F-35 programme, Danish companies have received orders for approximately 3.7 billion Danish kroner in relation to the development and production of the aircraft.**

### Industrial partnership for defence-related exports to the US

The F-35 is developed and manufactured in a US-led partnership in which Denmark participates. All orders for production, operation and maintenance of

the F-35 observe the 'Best Value' principle, whereby companies from the F-35 countries internally compete to supply the best and lowest-cost products and services.



In Denmark, an 'Industrial Partnership for Defence-related Exports to the US' has been set up as a group of authorities and industrial operators working to strengthen the cooperation with Denmark's US partners in connection with the procurement of F-35 fighter aircraft for the Danish Armed Forces. The partnership works to support Danish companies' possibilities of competing for tasks relating to the manufacture and maintenance of the F-35 and to pave the way for other high-tech or defence-related exports to the USA.

The partnership works on actions targeting Danish companies, US companies and US authorities, including through B2B events and other export promotion

in both Denmark and the US. This creates continuously new opportunities for Danish companies. Since Denmark entered into the F-35 programme, Danish companies have received orders for around DKK 3.7 billion relating to the development and production of the aircraft. Danish orders relating to the production process are expected to continue.

Denmark took delivery of its first F-35 fighter aircraft in April 2021. Concurrent with the delivery of the aircraft, focus will intensify on the operation and maintenance of the F-35 both in Denmark and globally. The Government will work to put Danish companies in a position where they can exploit these opportunities.

### Production in the defence industry

The Danish defence industry supplies advanced, high-quality products. In this context, a highly qualified Danish workforce is crucial, providing everything from industrial technicians to IT engineers.

Increasing demands for automation and digitisation of production processes are making themselves felt across all sectors and in the defence industry as well.

The companies in the defence industry are already upgrading in the area, which is strengthening their quality, productivity and security of supply in the process. The public sector supports developments via Denmark's trade promotion system and other measures.



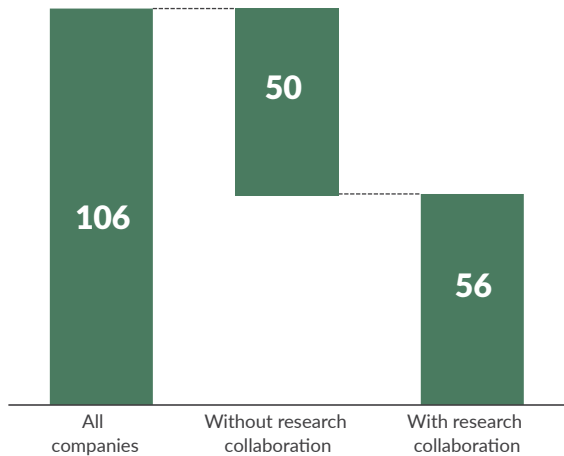
Innovation and new partnerships are necessary to ensure that defence authorities and Denmark's defence industry are ready to meet the future. Danish universities are upgrading their educational and research activities in the areas of defence and innovation to secure Denmark's position as a pioneer in digitisation. Particular actions target areas such as artificial intelligence, big data and quantum technology. At the same time, Danish research institutions are world-leading in select areas of space and military technology. This research can support Denmark's national security by converting new knowledge into innovation in Danish companies and into solutions for Denmark's operational entities. In Denmark, defence-related knowledge is dispersed among a number of universities and Danish Association of Research and Technology Organisations (GTS) specialising in various technological segments of the defence and security area.

Research institutions can support and enhance Danish defence companies' competitive technological advantages by engaging in closer, more targeted dialogue and cooperation.

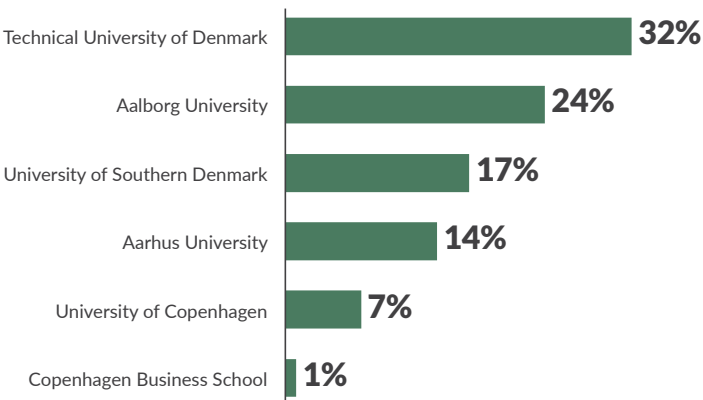
In recent years, space exploration has assumed a more prominent position in the areas of defence and security policy, both in Denmark and abroad. NATO has officially announced that space is a separate new operational domain, and the EU has brought focus to bear on the synergies between the civil, defence and space industries. The interest in space technologies is increasing as the technology increasingly constitutes a premise for our society being able to function and for our ability to monitor, operate and communicate in areas of national interest. Denmark hosts a space industry that is innovative, agile and specialised and which will be crucial, going forward, for Denmark's capacity to



Defence industry and university collaboration...



...with select institutions in Denmark



Source: Intern analyse gennemført af Forsvarsministeriet, 2020

protect national security in and from outer space. This requires authorities, research institutions and companies to enhance and utilise the establishment of a knowledge base, dialogue and cooperation concerning space technologies of military relevance for the benefit of Denmark's national security.

To maintain its competitiveness, the defence industry needs a qualified workforce. The demand for graduates of a number of STEM (Science, Technology, Engineering & Mathematics) study programmes is particularly high. As part of the establishment of a knowledge and expertise base, the STEM study programmes have been an object of focus for years, and this effort has managed to increase the intake

of students to non-adjusted, higher STEM study programmes by 81% in the period 2009–2019. This means that the trend is going in the right direction, but there continues to be a high demand for labour with specific STEM qualifications. This requires persevering focus on the STEM agenda. To further promote this trend, a Technology Pact was created in 2018 to gather the operators in the area and support projects that will advance the STEM agenda. Recipient panels have been set up at a number of relevant STEM study programmes where the industry and the educational sector can engage in dialogue about the technical skill sets needed for the future.

Collaborative research

Denmark's research institutions possess knowledge and expertise in the technological areas that are valuable to Denmark's defence companies and the Danish Armed Forces. These include areas such as advanced materials capable of withstanding unusual climate conditions in the Arctic, robotics and automation technologies, satellite technologies, energy technologies, and much more besides. It is not only major Danish systems suppliers that are engaged in close collaboration with Denmark's research institutions. A number of small, innovative start-ups have been incubated in university environments and are closely affiliated with the Danish research sector.



# Conditions of competition for the Defence Industry

It is a Danish priority to have an open, free and competitive market for defence equipment.

Denmark continuously works to ensure an open, competitive international market for defence equipment that promotes innovation and competitiveness in the defence industry. The aim is to ensure market access for the Danish defence industry and to ensure that the Danish Armed Forces can acquire modern equipment of the right quality and price on the international defence-equipment market.

As a general rule, Denmark acquires defence equipment and services in the defence area by applying the EU defence and security directive 2009/81/EC on procurement in the defence sector. In addition, Denmark supports the European Commission's efforts to develop a competitive European defence industry and is actively involved in ensuring that the European Defence Fund contributes to this wherever possible.

Even so, international defence equipment markets are still characterised by widespread protection of national manufacturers out of consideration for protecting national security interests. This makes it difficult for small and medium-sized enterprises from small countries in particular to be allowed to cooperate with and become external suppliers for big multinational suppliers.

At the same time, the defence equipment market is characterised by a number of sector-specific access barriers which in practice are difficult for small and medium-sized enterprises to overcome. For example, SMEs must comply with rigorous requirements

for quality control, production and export permits, cybersecurity and sector-specific certifications. In addition, the market is characterised by having few end-customers, large one-off acquisitions, and an irregular demand pattern in which the size of defence budgets varies according to the security-policy situation at the time in question. Overall, this creates a market in which it is difficult for companies to plan production processes and investments expediently in the long term.

It is crucial for Denmark's national security that Denmark is able to call on competitive defence-industry expertise and capabilities in areas of strategic significance for the protection of Denmark's essential security interests and to ensure that companies in the Danish defence industry have a key position within international defence-industry supply chains.

In the first place, Denmark is ultimately responsible for its own national security, sovereignty and independence. Therefore, in unforeseen crises, Denmark must be able – on its own – to identify, assess and develop countermeasures against new threats, including the capability of maintaining key systems and equipment to a specifically defined extent. Secondly, Denmark must remain an attractive, trustworthy partner in international security cooperation as part of the protection of joint security interests and the strengthening of the European and North American defence industries. By being an attractive partner and creating interdependence in the protection of joint security interests, Denmark can reinforce the basis for the provision of allies' support if Denmark's national security and sovereignty is threatened.

Accordingly, the Government prioritises Denmark's ability, in special instances when essential security interests are concerned, to implement necessary, proportional, market-correcting measures to ensure the maintenance and development of the national defence-industry base with regard to critical defence equipment. Prospective measures will always have to be determined on the basis of an individual, specific assessment pursuant to European law governing the area, including Article 346 of the Treaty on the Functioning of the European Union (TFEU).

### The European Defence Fund

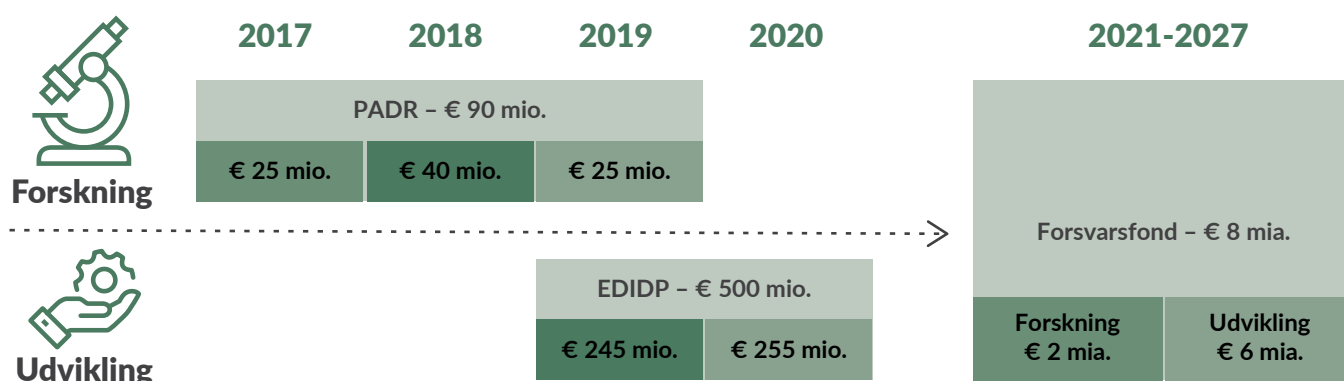
In recent years, the EU has brought focus to bear on how to strengthen cooperation and knowledge-sharing across the European defence industry and traditional sector boundaries. Denmark supports the Commission's efforts to develop a competitive European defence industry, including through efforts involving the European Defence Fund and by strengthening spin-offs and spin-ins through reciprocal cooperation in the civil, space and defence industries.

The Regulation establishing the European Defence Fund was adopted in May 2021. The purpose of the Fund is to establish better conditions for member states to cooperate on research, development and the acquisition of defence equipment and to ensure an open, innovative and competitive European defence industry. The European Defence Fund will allocate roughly EUR 8 billion over a seven-year period from 2021 to 2027.

The European Defence Fund is not covered by Denmark's defence opt-out, which means that Denmark – authorities and private operators alike – participates on an equal footing with other EU member states. The European Defence Fund's test programme, the European Defence Industrial Development Programme (EDIDP), has shown that Danish companies can successfully take part in the programme. Denmark's participation in consortia under the European Defence Fund is important in terms of collaborating with defence-industry companies across the EU and for developing technologies and capabilities in the Danish defence industry for the benefit of Denmark's national security.

Denmark has a national action plan for the European Defence Fund that aims to ensure the acquisition of funding for Denmark from the Fund. Denmark is actively working to develop the European Defence Fund in a direction that takes greater account of small and medium-sized enterprises from small member states to promote competitiveness and innovation in the European market. The authorities will continue to provide support and guidance to Danish companies and research institutions that want to take part in projects under the European Defence Fund. Denmark is also working to heighten the extent of spin-in technologies, such as energy optimisation and innovative new technologies, that are included in the implementation of the Fund's allocations. This is particularly important in the defence area going forward and constitutes Denmark's industrial positions of strength.

The European Defence Fund is a result of two precursor test-programmes – the research dimension 'Preparatory Action for Defence Research' (PADR), from 2017 completed in 2020 and the capability dimension 'European Defence Industrial Development Programme' (EDIDP) from 2019 and completed in 2021.



Source: Multiannual financial framework 2021-2027

# Areas of Technological Priority

Certain industrial areas of expertise and capabilities are of particular importance to carrying out tasks in the defence sphere and for the protection of Denmark's essential security interests. Accordingly, the industrial expertise and capabilities associated with this have special strategic significance for Denmark's national security. The technological areas indicate the priorities for the collaboration between the Ministry of Defence and the Danish defence industry.

It must be possible to maintain, strengthen and develop the areas of technological priority in collaboration with the Danish defence industry to support Denmark's essential security interests, with particular focus on our security interests in the Arctic and the North Atlantic. The areas also take into account whether it is in Denmark's interest to provide assistance in international defence alliances, which also includes Denmark's ability to fulfil its NATO obligations.

The areas must serve as a guiding prioritisation tool and lay the groundwork for engaging in dialogue with the industry on collaboration. The areas are interdependent. For instance, systems integration assumes the existence of relevant equipment platforms that can be integrated across the individual armed forces. Furthermore, the areas are dependent on changes to perceived threats and technological developments, on developments in Denmark's alliances, and on the acquisition needs that can arise – so that Denmark can remain an active, supportive ally. The areas are also dependent on developments within the international defence industry. Concurrent with the development of new solutions and the

formation of new collaborations and alliances, new technologies and expertise will gain significance for Denmark's national security interests.

In conjunction with specific acquisitions of defence equipment, the areas of technological priority will be included as part of the overall basis for decision-making in the assessment of any measures pursuant to Article 346 TFEU. Prospective measures are to be decided individually and on the basis of necessity and proportionality assessments pursuant to EU law.

The Government will prioritise the six currently most significant areas in its collaboration involving the authorities and the Danish defence industry.

## **Domain-specific technologies of critical significance for military operations**

These comprise particularly critical technologies in the chain of operational activities from threat detection to the execution and evaluation of operations within all domains. Priority is given to adaptable, modular technologies that can be future-proofed on an ongoing basis in relation to the changeability of threats, technology, climate and the environment that are of particular importance to national security. Particular priority is also given to technologies adapted to Arctic conditions. Finally, priority is given to flexible technologies within the domain-specific technologies capable of strengthening Denmark's total defence and being involved in the overall civilian emergency response set-up in the event of crises. Particular focus is given to the following:



➤ *Modular maritime technologies*

This particularly comprises technologies capable of ensuring the ability to adapt to developments and operate in the North Atlantic, the Arctic and the Baltic Sea, which is why specialised technologies within modular maritime platforms will be prioritised, including technologies for flexible task performance.

➤ *Space technologies for surveillance and communication*

This particularly comprises technologies that strengthen the ability to operate in the Arctic. The Arctic imposes unique requirements inter alia on surveillance and communication. This is why priority is given to satellite technology as well as technologies in the area of satellite-based sensors and communications adapted to operational needs.

➤ *Autonomous and unmanned systems*

This particularly comprises technologies for developing and manufacturing a wide range of types of drones (micro to medium-sized), as well as associated sensor packages. This encompasses technology for advanced use of drones, such as swarming drones and autonomous drone operations. The equipment used in Arctic drone operations must meet special technological requirements arising from the unique climatic and topographical conditions. In addition, this particularly comprises special technologies in the area of countermeasures for the detection and countering of autonomous and unmanned systems, including the countering of unmanned aircraft systems (C-UAS).

**Critical technologies for use in command control systems, information systems and systems integration**

This particularly comprises technologies that can safeguard the situational and intelligence scenario in a vast operational region such as the Arctic, and which can support the capability to plan and carry out operations. In addition, the area particularly comprises technologies such as decision-support systems that enhance decision-making capacity in a battleground. Priority is given to systems integration comprising the abilities to select and combine different subsidiary systems, including in particular multidomain command and control systems. In this context, secure processing of data and transfer of data are crucial. In a wider perspective, priority is given to Denmark's national technological capacity for secure communication and the protection of information of particularly critical significance to national security.

**Advanced software, artificial intelligence and cyber technology**

This particularly comprises technologies and systems capable of collecting and analysing vast amounts of

data, which are autonomously capable of supporting conclusions of value to military operations. This also includes the technological area that promotes the interplay of autonomous systems and people. These areas are expected to become increasingly important for operational task performance. In the light of Denmark's wide and in-depth degree of digitisation throughout civil society, it is essential for the remit of the Ministry of Defence to follow the digital developments in the area of cyber technology, artificial intelligence and other development and use of advanced software.

**Advanced materials technology and processing for military purposes**

This comprises special materials technologies specifically designed for military purposes of critical significance for operational task performance, including materials that are well-suited for operations in the Arctic climate. In the light of the distinctive needs for materials technology with special characteristics, Denmark cannot rely on all the types of materials technologies and processing that are needed being available on the commercial market. This makes special demands on the interaction between defence and military authorities on the one hand and the industry on the other.

**Energy and environmental optimisation, as well as energy storage in relation to operational task performance**

This particularly comprises technology that supports operational task performance. The increasing digitisation of the Danish Armed Forces makes increasingly rigorous demands on having additional technological and electrical systems for all entities of the Danish Armed Forces. The extreme conditions in the Arctic, with vast distances and little infrastructure, necessitates special solutions that are optimised in terms of energy and the environment. This imposes correspondingly rigorous demands for smarter energy solutions, including more mobile and efficient energy-storage systems. In general, priority is given to cooperating with the defence industry on green solutions that can go hand-in-hand with operational considerations, such as by making operational supply chains less reliant on fossil fuels.

**Critical maintenance and lifetime support for military systems**

This particularly comprises supplies and spare parts, repair and maintenance capabilities, as well as lifetime support and updating programmes. Persistent technological developments impose increasingly rigorous demands on continuous lifetime updates of acquired equipment platforms and systems. The area also comprises particularly critical components capable of maintaining and developing particularly critical equipment.

# Action Areas

In dialogue with the representative of the defence industry, the Government has identified seven action areas that are intended to strengthen the Danish defence industry. The action areas will serve as indicators for the work and can be supplemented by tangible actions depending on the development of the needs of the Danish Armed Forces and in dialogue with sector operators. In addition to the strategy, a catalogue of initiatives has been drafted, in which specific initiatives are presented. Tasks arising from the seven action areas of the strategy will be carried out in cooperation with representatives from across the authorities, industry and research institutions.



## 1. Strengthened cooperation between the Ministry of Defence and industry

The Government will strengthen the cooperation of the Ministry of Defence, the defence industry and the civilian high-tech industry to increase knowledge-sharing, technological developments and the sharing of expertise. The Danish Armed Forces are dependent on the products and skill sets available in the defence industry. At the same time, the defence industry is dependent on having insight into the end-user's needs. Beyond that, focus will be brought to bear on the role of the civilian high-tech industry in terms of spinning in new solutions for the classic defence industry for the benefit of Denmark's national security and developments in the defence industry.



## 2. Internationalisation and access to foreign markets

The Government wants to strengthen the defence industry's export potential and promote international defence-industry cooperation. The Danish defence industry's high export percentage is valuable to Denmark, as defence-industry cooperation comprises a foundation for operational cooperation with allies due to system convergence and interoperability. At the same time, the cooperation establishes security of supply dependencies towards Denmark. Moreover, the earnings potential on export markets is crucial for the viability of the Danish defence industry.



## 3. Good framework conditions for the defence industry

The Government wants to ensure good framework conditions in the defence-industry sector to optimise the defence industry's scope for contributing to Denmark's national security. The defence industry's framework conditions are unique, and the industry is subject to a number of national and international regulatory frameworks and control schemes. These regulatory frameworks are crucial for national security interests in Denmark and other countries. In addition, the Government gives priority to ensuring that the defence industry encounters efficient, transparent administration of the regulations governing the defence-industrial area. Concurrent with the development of sector framework conditions, it is important to ensure that they continue to be coherent and transparent and that they are supported by efficient administration.



#### 4. Targeted industrial support and cooperation

The Government wants to ensure the accumulation of strategic expertise in the Danish defence industry out of consideration for the protection of Denmark's essential security interests. In specific contexts, this can require measures of a market-corrective nature with a view to ensuring defence industry capability on Danish territory. Based on a specific assessment, one of the ways this can be done is by requiring foreign suppliers of equipment to the Danish Armed Forces to enter into cooperation with Danish companies within the selected areas of technological priority.



#### 5. Stronger innovation and research cooperation

The Government will bridge the gaps between research, industry and authorities in the area of defence technology. New technologies are becoming increasingly important. At the same time, they are so complex that they can only be mastered in cooperation with the industry and research institutions. This is particularly true of the space sector, where space has gained increasing security-policy significance, which increases the relevance of cooperation across traditional sector boundaries separating defence, space and civilian high tech. Finally, the Government sees opportunities for attracting foreign investments to Denmark in cooperation with research institutions.



#### 6. Strengthened social commitment and green focus in the defence industry

The Government wants to support the defence industry's focus on social responsibility and the green agenda. The Government has articulated an objective to strengthen the green transition in Denmark. The defence industry is responsible for contributing to the green transition as well as to the special positions of strength that can form the basis for green exports. Similarly, the authorities are responsible for ensuring that the defence industry's framework conditions can advance the green transition. In addition, the defence industry is uniquely well-positioned to support Danish veterans and enhance the entry of apprentices into the Danish labour market. Finally, the Government aims to work to ensure that Danish companies are the driving force in efforts to strengthen commercially-driven social responsibility. This applies to the defence industry as well.



#### 7. Modern technological focus

The Government wants to promote a modern technological focus in the area of national defence and the defence industry. Denmark has a strong innovation structure (Danish research and technology organisations (GTS), clusters, the universities' external cooperation projects) that benefits innovation in the Danish business community. The Government sees potential in the defence industry increasing the degree to which it uses the established innovation structure via the recently designated clusters. Beyond that, there is potential in the fact that the defence industry's general commercial challenges and opportunities are supported by means of advisory services in Denmark's nationwide trade promotion system.







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Ministry of Industry, Business and Financial Affairs  
Slotsholmsgade 10-12  
1216 Copenhagen K

Tel.: +45 33 92 33 50  
Email: [em@em.dk](mailto:em@em.dk)

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Ministry of Industry, Business and Financial Affairs  
Slotsholmsgade 10-12  
1216 Copenhagen K

Tel.: +45 33 92 33 50  
Email: [em@em.dk](mailto:em@em.dk)