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Denmark's need for fighter aircraft

A strategic analysis of the future need for Danish fighter aircraft

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Abstract

Denmark should retain a limited fighter aircraft capability. The Danish decision on the procurement of fighter aircraft to replace the F-16 should be based on an extensive examination of Denmark's strategic requirements, including a political vision for the future role of the Danish Armed Forces. Consequently, the final decision should be made as part of a defence agreement. When considering the type of aircraft Denmark should procure, attention should be paid to the fact that new fighter aircraft are part of a military network – in technological, operative and strategic terms. The direct and derived effects of the opportunity to be part of such networks should be decisive factors, when choosing the type of aircraft.

Recommendations

Denmark should retain a fighter aircraft capability of sufficient size to enable periodical participation in international missions, while also maintaining a deterrent readiness as an integrated part of 'homeland defence'.

The type of fighter aircraft to be procured and the number of fighter aircraft required by the Danish Armed Forces is to be assessed based on a joint political, strategic decision on the role that airpower should occupy in the Danish Armed Forces. Hence, the decision on replacement fighter aircraft must include considerations of whether fighter aircraft are to be complemented by other types of airpower capabilities (e.g. combat helicopters).

When deciding on the type of replacement fighter aircraft, the government and Parliament should carefully consider that the choice of fighter aircraft could strengthen and develop the options for operative collaboration with our allies.

The decision on which air capabilities the Danish Armed Forces should possess, should be a decision singularly based on defence politics. Considerations concerning indirect support to national industries should not be part of the assessment.

Content

01 Introduction

Does Denmark need a new fighter aircraft, when the F-16 is due to be phased out? Considering the missions that the government and Parliament will find it necessary for the Danish Armed Forces to take part in over the next 30-40 years, the answer will be yes. In the varied and unpredictable globalised security environment, the Danish Armed Forces must expect to join missions spanning the entire spectrum of conflicts: from *armed stabilisation,* where the role of the armed forces is to secure the establishment of stable societal structures; to *armed diplomacy,* where military force is used to compel a government to e.g. discontinue production of weapons of mass destruction; to *armed conflict,* in which the armed forces have to fight the armed forces of other countries. Fighter aircraft are important elements in those three missions. However, there are no given standards for which or how many fighter aircraft Denmark shall need in order to participate in those three types of missions, nor is it a given fact that fighter aircraft would always be the best platform for airpower in such missions.

The public debate on replacement fighter aircraft has been based on which aircraft Denmark could and should procure, rather than the demands any new aircraft have to meet. Perhaps this is not so strange. On the face of it, it is more tangible to discuss types of aircraft and more interesting to guess who will win the huge commercial order, than it is to conduct a specific strategic analysis of the Danish requirements for fighter aircraft. However, it could have adverse effects on the organisation of the Danish Armed Forces if the decision to procure a possible replacement fighter aircraft is based on the qualities of potential replacement fighter aircraft rather than on the needs of the Armed Forces in future missions. The development in military technology entails that fighter aircraft is not simply an aircraft, but a platform within a military network. Optimal use of the aircraft can only be achieved, when it is an integrated part of a technical and organisational network, supplying what is known as 'enablers' in the military jargon (e.g. radar and air refuelling), and the rest of the armed forces can only find a use for the aircraft if it can be part of the network so that e.g. ground troops receive the air support they require.

When a fighter aircraft is viewed as a capability, it is not the properties of the given fighter aircraft, but the missions in which the Danish Armed Forces participate that determine which and how many fighter aircraft should be procured. Obviously, the technical evaluation of the aircraft is important (not least in order to assess the costs of the fighter aircraft during its entire lifetime). However, this evaluation cannot be considered, until after the government and Parliament have reached five basic political decisions. The first of which is: Should Denmark retain a fighter aircraft capability? If the answer to this question is yes, a further four political decisions must be made: How to make this decision? The size of such capability? Which type of fighter aircraft to choose? When to make those decisions?

The Danish Armed Forces need a capability to apply airpower in the mission areas. When the government and Parliament have to assess whether a fighter aircraft capability is required and how big it should be, inevitably, they also have to assess whether alternative airpower platforms can carry out the functions presently carried out by the F-16, and possibly be more compatible with future military networks. This could be helicopters or unmanned aircraft, the so-called UAV (*Unmanned Arial Vehicle*). Precisely because the Danish Armed Forces must expect to take part in a number of different types of missions, in which different capabilities produce different benefits, it could be advantageous for Parliament to allocate funding for the purchase of airpower capabilities rather than for a specific type of aircraft. The fact that the price of *Joint Strike Fighter* (JSF) still varies considerably is another argument in favour of this approach.[1] Such a framework allocation will make it possible to amass the correct airpower capability based on a joint vision for Danish airpower. Finally, it should be considered whether it might be advisable to postpone the decision on choice of number and type of fighter aircraft until such time when, on the one hand, a joint strategic vision for airpower by the Danish Armed Forces is available, and on the other, a clarification of the choice of our closest allies has been reached for future fighter aircraft capabilities.

Hence, Denmark should retain a fighter aircraft capability of sufficient size to enable periodical participation in international missions, while also retaining a deterrent readiness, which in these times of terror must be viewed as an integrated part of 'homeland defence'. The choice of type is not only important in relation to technical specifications. The choice is a practical bond to our alliances. Moreover, the choice is important viewed in an operative perspective. The optimal use can only be obtained from a fighter aircraft in combination with the appropriate support structure, but Denmark does not have sufficient capabilities with respect to air refuelling, command and control etc. for a new fighter aircraft to be used in an optimal manner by Denmark alone, and even if such capabilities could be procured, the armed forces would still have such limited capabilities that they would not be able to apply them as frequently, as would most likely be required. The question of retention of continuous, organisational expertise on fighter aircraft in particular and advanced airpower in general, may also have effect

on the choice of type. For instance, emphasis can be placed on retaining less capability with a view to subsequent extension or refocusing to another form of advanced airpower. This discussion is particularly relevant because, owing to the technological development, this fighter aircraft could well be the last to function as a conventional fighter aircraft – in the very long term, airpower will probably be dominated by UAVs.

The aim of this report is to inform the public of the consequences of the purchase of fighter aircraft, and to provide the politicians with the tools to make the decision. Consequently, we have opted for an analysis of the phenomenon 'fighter aircraft' in a broad forward looking perspective and of Denmark's future strategic requirements, including the demand for fighter aircraft. The future covered by this report involves the next 30-40 years. We have opted for that period, because a new fighter aircraft has an expected lifetime of approx. 30 years.[2] Since the F-16 is anticipated to be operative for the next 10-15 years, and any new fighter aircraft must be implemented during this period,[3] the strategic conditions upon which any decisions for procuring the aircraft are made have to be valid for at least 30-40 years.

Our aim has been to avoid a one-track analysis with only one set of prospective recommendations. Instead, we wanted to present some general observations that can result in different political decisions, depending on which single factors are emphasised. We do not thus give any definite answers. We present tools for constructing one's own answers, and in addition we offer a number of recommendations that we estimate would provide the best possible prerequisites for reaching a political decision about a replacement fighter aircraft. Consequently, we have made a number of assessments of e.g. the future strategic environment, of Denmark's role within this, and of the military technological development. In an age with huge security-political changes, such conditions may change, but this is precisely the challenge for Danish defence politics.

Therefore, it is important to emphasise that this report is a strategic analysis and not a strategy. A strategy is a description of the prevailing political aims and the available military means (e.g. fighter aircraft) to be used in order to achieve them. In other words, a strategy is a political choice to be made by the government and Parliament. The analysis of this report is strategic, since it describes the interaction between political and military aspects. The report examines e.g. the influence of a political desire for involvement in different types of conflicts on the capabilities Denmark should procure, once the F-16 is due to be phased out.

This report concerns only the future Danish strategic requirements for fighter aircraft. Hence, technical issues concerning strengths and weaknesses of the individual types of aircraft are *not* dealt with. Consequently, the analysis does not move 'from the aircraft to the world' but 'from the world to the aircraft'. This is an advantage for two reasons. Firstly, focus on the analysis of prospective future requirements entails that the political decision can be based on the need for an aircraft rather than on the properties of the aircraft. An

investment of the size of a replacement fighter aircraft should be based on other and more general factors than the aircraft itself. Secondly, the focus of the analysis on various types of missions and strategic elements, establishes the basis for a wide-ranging political debate on this and other strategic options in Danish defence and security politics.

The report contains three major parts, the first of which sets out to clarify how Denmark should not only buy an aircraft, but a capability to be used in conjunction with all services as well as those of other countries. The second part of the report sets out three main types of military missions, which the Danish Armed Forces can be anticipated to partake in during the operation time of any new fighter aircraft. As previously mentioned, the three military missions are armed stabilisation, armed diplomacy and armed conflict. The third part of the report discusses the political effects of the political choices connected with the phasing out of the F-16 and any replacements of those. The final part of the report contains our conclusion.

02 Airpower and Networks

When Parliament is about to decide whether Denmark should buy a number of fighter aircraft to replace the F-16 it is quite natural indeed to discuss which aircraft the Armed Forces should have. However, the question about which aircraft to buy cannot be determined by the characteristics of the individual types of aircraft. For today, an aircraft is not just an aircraft. It is part of a network, and its performance is a function within the network. Thus, the most important is not what the aircraft can do, but what it is capable of within a network. Consequently, Parliament has to ask within which network the Armed Forces are going to place a new aircraft, and based on this must decide on the airpower capabilities the Armed Forces need in their network and whether any given fighter aircraft will be able to fill that position – or whether alternative platforms should be considered to carry out the functions presently performed by the F-16.

This chapter is about airpower and the military technological development's significance for airpower. Airpower, like any other type of military power, is increasingly defined by those networks, within which aircraft and other aviation platforms are contained. Thus, we are going to explain how airpower should always be seen in an operative sense as part of a larger system; and that this military system only makes sense in a political reality that combines the system with a purpose. The network, however, goes further in that Denmark is a small nation, which entails that Denmark cannot conduct meaningful defence politics on its own, but naturally has to seek international collaboration including defence alliances. In other words, fighter aircraft in a Danish context are part of a larger tool that is applied to obtain a political aim in an always international context.

The next section of this chapter deals with how a fighter aircraft should be viewed as part of a military network. If the development of information technology, which has turned networks into the prevalent military form of organisation continues, UAVs may very well become the future solution. The subsequent section concludes that even though it is a future solution to employ UAVs together with

advanced fighter aircraft, this will not happen in the immediate future. The last section discusses how the network-related perception of the role of the fighter aircraft entails that it is necessary to focus on the missions a new fighter aircraft would be used for in order to assess whether it is needed.

Fighter aircraft within networks

In an article on the F-22 fighter aircraft, defence analyst Peter Goon estimates that this aircraft is eight times as efficient as the F-15, which it replaces.[4] Even though it is difficult to measure one aircraft against another, a good engineer is likely able to give an indication of differences in strength. But even if the F-22 is eight times more efficient than the F-15, it does not mean that an air force purchasing the F-22 will become eight times better. Because, an aircraft does not fight alone. Instead of looking at the individual aircraft and its performance, an aircraft should be viewed as a platform that is part of a network. 'The valid assessment for military planners to make,' writes defence analyst Frank Finelli, 'is not their aircraft against our aircraft but their aerospace system-of-systems against ours.'[5] The system-of-systems like networks describes how platforms such as tanks, warships or fighter aircraft increasingly perform in accordance with the network they are part of. Dr. Alan Stephens describes it thus:

> An air platform has not amounted to a capability in its own right since at least the time of the American-led war in Indochina, when strike/fighters engaged in control of the air and bombing missions over North Vietnam could not operate effectively unless supported by en extensive "package" of airborne enabling forces, including electronic jamming, suppression of enemy air defences, intelligence processing, and tankers.[6]

Aircraft is part of a 'package', and the performance of the individual aircraft cannot be viewed independently from the package (the network), which they are part of. By now, this is old knowledge, as is the fact that the fighter aircraft that are part of the network are now based on old technologies. Even so, a new aircraft like the F-22 is far more efficient than the F-15, which was produced from 1972. The explanation for this is that since the 1980s, aircraft have been given large sensor capabilities, *stealth* technology has been introduced and there has been an increase in the use of precision guided munition.[7] This makes the individual aircraft more efficient, but first and foremost it means that aircraft can be used in a different manner within networks of military capabilities.

In this network, airpower constitutes a central component.[8] More information about what happens on the battlefield and more accurate weapons means that the air force is able to support other military services with unprecedented speed and precision. This entails that to some extent, the firepower of the air force can supplement e.g. artillery. The increased amount of information contained in military networks thus provides increased opportunities for collaboration, which again means that military operations

increasingly have become joint forces operations. The Gulf War in 1992 was one of the first examples of this. As Ronald R. Fogleman, then US Air Force Chief of Staff, put it in 1996:

> President Bush said, "Lesson No. 1 from the Gulf War is the value of airpower." Now that may have been lesson No. 1, but there is another important lesson – that is warfare today, and in the future, will be joint warfare.[9]

What then is the general and specific role of fighter aircraft in such joint networks? Fighter aircraft can (1) ensure air superiority, (2) provide tactical support to sea and ground forces, and (3) carry out strategic bombing of the enemy.[10]

One party in an armed confrontation has air superiority when the opponent's air force is not able to prevent the other in conducting operations with its land, sea and air forces. Hence, securing air superiority is decisive for being able to complete other operations. In a military environment that is increasingly dependent on intelligence, air superiority can also be a decisive element with regard to active collection of intelligence about enemy movements.

Tactical application of airpower to support other military operations exploits the opportunities of the air force to swiftly deploy huge destructive force over large distances. The more this flexible fire power can be integrated into army operations, the more flexible the ground forces become, because, owing to the support from the air force, they do not need to move with very heavy equipment. Strategic application of airpower is often narrowly defined as attacks on factories, cities and other targets of central importance for enemy moral and will to fight. To a large extent, this distinction is a relic from the middle of the 20th century, when the application of long-range bombers against enemy targets were seen as a separate mission, which alone could decide the outcome of the war – a view that was merely reinforced by the introduction of nuclear weapons.[11]

In a modern network-controlled war, however, it does not make sense to separate the strategic level from the other war operations, since often, attacks on strategic targets far beyond enemy lines are closely integrated with more immediate tactical targets. Thus, fighter aircraft in conjunction with special forces and cruise missiles have played a central part in the initial phases of major armed conflicts such as the Gulf War, in the Balkans, in Afghanistan and in Iraq.

Fighter aircraft should thus not be viewed separately, but have to be understood as being part of a network. The debate on whether Denmark should invest in aircraft to replace the F-16 should consequently be based on the network of which such new fighter aircraft must be part. However, the question is whether fighter aircraft are already becoming an obsolete platform in the military networks of the 21st century. This question is discussed in the following section.

The fighter aircraft of the future is not an aircraft

Operations based on networks do not change the functions of the military forces. However, the increasing integration between the forces entails that some platforms are now able to carry out more functions. One obvious example is that, to an increasing extent, fighter aircraft is now providing support to ground troops that was previously carried out by artillery. Information and precision technology have thus allocated a central role to aircraft within network-centric operations. Even so, technological development means that in time, other platforms will be able to carry out the functions presently performed by fighter aircraft.

If Denmark purchases new fighter aircraft, they will be decommissioned by 2050. Come that time, it is possible that UAVs will have taken over many of the functions presently carried out by fighter aircraft.[12] When Boeing failed to win the order to build JSF for Lockheed Martin, the corporation decided instead to focus on this development by transferring much of the staff from the JSF development department to Boeing's UAV project.[13]

The development of UAVs is promoted by two aspects, each of which consolidates the other. First of all, the development of fighter aircraft is becoming so costly that, if in future, the air force is to retain a suitable amount of aircraft, it would be an obvious choice to develop UAVs. There is a distinction between an actual replacement for fighter aircraft specifically – UCAV, or *'unmanned combat aerial vehicle'* – and ordinary UAVs, which can be armed or unarmed. UCAV does not yet exist, but their development will probably be completed around 2030. This type of aircraft is expected to cost the same as pilot driven fighter aircraft, because as a replacement for specific fighter aircraft, they will need to fulfil a range of advanced functions.[14] Conversely, some of the ordinary UAV will be much cheaper than fighter aircraft, but they are dependent on air superiority in order to operate freely. Some airpower functions can thus be established cheaper through a spectrum of UAV capabilities. Secondly, the fact that no pilot is required is another argument in favour of developing UAVs. In an age, where western forces are sensitive to losses, the unmanned platform can be used much more extensively. On the other hand, until some certainty of the function of this technology has been established, there could be an ethical as well as practical balance of pros and cons to consider, before discarding the human eye in demanding moments of decision-making. Finally, platforms presently used for close air support or tactical transport, such as helicopters, are typically more vulnerable than fighter aircraft.

Hence, the development of UAVs is not likely to mean that there will be no manned aircraft in the air forces of the world in 2100, though their relative numbers will be much lower. Should one decide to opt for UAVs, it means opting for a technology that has not yet been developed, and which is anticipated to operate in the military network alongside fighter aircraft. Hence, opting for UAVs does not mean discarding the usefulness of fighter aircraft. It simply means employing fewer of them. If this is the solution opted for, it would be

worth considering, whether the UAVs are going to replace the very functions of the fighter aircraft that is being considered for purchase.

Should Parliament decide not to buy any fighter aircraft at all, but instead opt for the development of UAV, it will have eliminated the application of Danish airpower in a number of missions. A not unimportant factor would be, that by deciding to opt for the far future at the expense of the present and the near future, large parts of the human and organisational resources in the air force that are vital for the Danish armed forces being able to carry out airborne operations, would be phased out. Restoring this capacity would take a long time and be very costly indeed.

Networks and missions

One thing is buying fighter aircraft, it is quite another having a military capability. Fighter aircraft is a platform in a military network, and the effect of a fighter aircraft cannot be viewed separately from the network, which it is part of. A fighter aircraft must be viewed as part of a capability and not as a capability in itself. In order for a fighter aircraft to be efficient and exploit its potential to the full effect, a wide range of other platforms has to be in place. At the same time, the fighter aircraft must be integrated in a joint network. As a starting point this network will have to be Danish, but it could equally well be an ad hoc network made up of allied forces sent on a given mission.

The fact that fighter aircraft is best used in a network, means that the type of mission to which the network is applied is central for assessing the need for fighter aircraft. According to the so-called Bruun Report that sets out a series of the central concepts behind the current Danish defence agreement, 'the Danish armed forces [...] must be specialised in providing a number of more specific, readily deployable military capabilities of a high quality in order to participate in the entire task spectrum.'[15] It is obvious from this line of thought, that international missions determine the requirements that define the capabilities, the Danish Armed Forces should possess. The Bruun Report acknowledges that such capabilities cannot be viewed separately, but should be seen as part of a network. At the same time, the authors of the report realise that Denmark may not necessarily have all the required resources for the network capabilities. Thus the report mentions conditions central to fighter aircraft operations ('NATO Airborne Early Warning aircraft (AWACS), capabilities for air refuelling') as areas, where the costs are so high that Denmark is unable to provide those capabilities on its own.[16]

The technological development in airpower since WWII has meant that Denmark has been unable to establish and operate an air force that would be able to single-handedly take on all missions made possible by the new technologies. This is also the case for almost all other NATO countries other than the USA. Therefore, the alliance has sought to increase capabilities for the small aircraft fleets by establishing joint resources, such as AWACS surveillance aircraft, air refuelling and strategic airlift capabilities, where specialised resources are either provided by the USA or planned as joint

procurements. In addition, there are either general or specialised capabilities, the services of which are provided either directly or indirectly by the USA (satellites), or which are used only by the USA and a few other NATO members, including *stealth* bombers, large transportation aircraft (C17, C5), spy aircraft, role specific combat aircraft, UAVs, close air support aircraft (A-10), gunships (AC-130) as well as a wide range of transportation and combat helicopters (Chinook, Blackhawk, Little Bird, etc.). The latter are categories to be found to varying degrees at a small part of some of the large NATO members in particular. Moreover, collective modern airpower also consists of a wide range of capabilities of a strategic nature (missiles) as well as the ability to further develop such capabilities.[17] The overall picture of today's airpower as platforms shows that it would be even more unthinkable in future for Denmark to have an air force that would be able to conduct all tasks single-handedly.

Since a platform is part of a network, the concrete network of any given platform will always define the contexts and types of missions, the platform will be able to take part in. Hence, the platform's network contributes to secure the political value of the platform in relation to tangible as well as more general alliance collaboration tasks. The necessity of the network further means that any given platform will naturally give access to concrete technical and operative knowledge. Finally, the connection between platform and network entails that the political value of the platform is directly proportional with its prospect for taking part in the network function. Consequently, the all-inclusive cost of the platform must include all the extra equipment required in order for the platform to achieve its full political function.

The capabilities of the air force usually have to operate in collaboration with the air forces of other countries, and so it would be tempting to view airpower solely as a joint effort in collaboration with the air forces of other countries. Yet this would ignore the fact that Danish airpower is part of the military power placed at the disposal of the government and Parliament by the Danish Armed Forces to ensure the security related national interest.

Therefore, in order to assess the need for fighter aircraft, we need to look at the missions Denmark might be anticipated to be part of in the next 30-40 years, which is the expected lifetime of the fighter aircraft. Based on the objective that Denmark must provide complete contributions, the need for fighter aircraft can only be assessed by analysing the missions; and only by assessing the need for fighter aircraft will we be able to estimate the demands to the network any continued Danish fighter aircraft capability must be part of. This is the subject matter of the next chapter.

03 Fighters and future missions

Denmark has not specialised in a particular type of mission. Specialisation would make military planning far easier and make it possible to predict the precise capabilities required by Denmark in next 30-40 years. However, this kind of precision would violate the security-political reality, which is indeed characterised by unpredictability and multifaceted threats. Hence, the Danish Armed Forces should anticipate that the government and Parliament want to deploy Danish troops to a number of various missions making different demands on troops and equipment. When drawing on the experience of missions made by the Danish forces since the end of the Cold War and assessing the security-political challenges of a globalised world, there are three types of mission environments it would be reasonable to anticipate the Danish forces will encounter in the next 30-40 years:

- armed stabilisation
- armed diplomacy
- armed conflict

Those three types of mission do not exclude each other. For instance, armed stabilisation in a given mission area can involve simultaneous civil-military cooperation in reconstruction projects and actual severe combat tasks of a type, one would immediately think were closer in nature to armed conflict. The borderline between armed diplomacy and armed conflict is also vague.

Moreover, one could imagine more clear-cut missions that are defined to a larger extent by the capabilities contributed by Denmark, than by the type of conflict. The best example of this are special force operations. Special forces can play an extremely important part in all types of missions, either as single Danish contribution to a coalition force or in a supportive role in connection with a conventional Danish force. With respect to airpower, the special forces are characterised by the fact, that contrary to other forces, they can also operate without air superiority. On the contrary, special forces can be used for identifying and guiding fighter aircraft to targets in the heart of enemy territory. Conversely, special forces need special types of

air capabilities in connection with transport and close air support (from e.g. helicopters or AC-130 gunships).[18]

The need for fighter aircraft in those three types of mission will be analysed in the following section.

Armed stabilisation

In former Yugoslavia, in Iraq and most recently in Afghanistan, Danish forces have taken part in armed stabilisation. In 2001-3 in Afghanistan, Denmark contributed six F-16 aircraft, which flew on 743 missions.[19] The task for the armed forces on such stabilisation missions is to create a secure framework for the development of a more just and stable society. In the years to come, Danish forces will participate in armed stabilisation, because globalisation entails that Denmark regularly will feel her values and security to be challenged by unstable nations.

In a globalised world, any precariousness in a society losing its equilibrium can echo round the rest of the world.[20] Globalisation brings changes that challenge existing social structures, whilst globalisation also makes those social structures more open to outside influences. As early as the 1990s, the conflicts in former Yugoslavia revealed how civil war develops an international dimension through financial, ideological and perhaps even military support from Diasporas or friendly nations.[21] The society's balance point, consequently, is not merely a balancing of internal factors – external factors play a part from beginning to end. Hence, the Bruun Report states that 'conflicts and problems are transported more swiftly in a world of open communities, porous borders, close global interaction and new information and communication technologies. The vulnerability of the individual society is increased and it is more exposed to blows from the outside world'[22] It is worth noting that not only third world societies are becoming more vulnerable. Globalisation further means that stable industrial societies like Denmark become more directly connected to the problems from unstable societies in the third world. Not only goods are imported by the global trade routes, but also refugees and terrorism are. At the same time, continuous global news coverage attracts more attention to as well as a feeling of responsibility for events in far-flung corners of the world. In 1938, the British Prime Minister, Neville Chamberlain refused to help Czechoslovakia, because it was a distant country, of which his constituents knew little. Today we know more about even more distant countries; this knowledge forms the basis for the new western debate, of whether globalisation brings an obligation in its wake to intervene against the injustices of the world.

Nevertheless, it is usually not abstract moral considerations or general instability that sparks off a western desire to use armed force to stabilise distant countries. The need for stabilisation usually occurs in connection with an event in an unstable country, which sets off the anger or indignation of the world society. In former Yugoslavia, it was the use of ethnic cleansing that set off intervention. In Iraq, it was the collapse after the fall of Saddam Hussein that convinced even opponents to the invasion of the need

for armed stabilisation. In Afghanistan, it was a desire to prevent that once again the country should be a base for terrorists that put first intervention and later stabilisation on the agenda. The desire to deploy a UN force in Darfur is also based on a desire to stop the genocide made possible by the unstable situation in Sudan.

Thus the aim of armed stabilisation is positive in the sense that military force is to make the creation of a new and better society possible. Military intervention is a necessary precondition for the completion of the mission, though the mission cannot be completed by military means only. The success of the mission is determined by the efforts of the civilian authorities to relieve distress and to create a new societal balance based on democratic values.[23]

Thus the purpose of the armed element of the stabilisation mission is to create a framework of security, enabling the civilian authorities to operate and instilling in the local population the confidence that working for a new society serves a purpose.

A basic precondition for establishing a military background of security for the stabilisation mission is air superiority. Air superiority contributes to securing full freedom to act for both the civilian and the military participants of the mission. At the same time, it is also a precondition for building the trust required for a society to re-establish its equilibrium. In the 1990s, patrols by US fighter aircraft were decisive for the Kurds in Northern Iraq being able to rebuild their society after decades of persecution from the central government in Baghdad, since Saddam Hussein's regime was prevented from terrorising the population from the air.

During armed stabilisation missions, western forces do not normally need to fight to win air superiority. On the other hand, the air forces must have the capabilities to fight off enemy air forces and to protect the civilian and military aircraft of the mission. Fighter aircraft is an essential capability with respect to fulfilling this part of the mission. Yet, the offensive application of air forces during armed stabilisation missions are focused on the way in which airpower can support ground activities.[24]

In 1995, NATO conducted an armed stabilisation mission in Bosnia (IFOR, SFOR) to ensure the implementation of the Dayton agreement. Initial NATO forces counted 60,000 men. At that time, western forces had surplus capacity in relation to the missions they were sent on. Since then, the forces have been reduced in number in order to realise the so-called peace dividend following the Cold War, whereas the number of missions, not least including stabilisation missions, has increased. The overwhelming force NATO used to stabilise Bosnia simply does not exist any longer. Hence, NATO's mission in Afghanistan, which is a far larger country, in which severe fighting takes place, is approximately half as big as the force, NATO sent to Bosnia. When there is great distance between troops and tanks on the ground, airpower increases the battle strength of the forces (it is a so-called *force multiplier*) since fighter aircraft can be moved between scattered troops as required and provide increased battle strength. Moreover, air forces can patrol and support civilian missions on their own.

This is a role that has been performed through airpower since the establishment of the air forces. In the Interwar Period, the British air force (*Royal Air Force*, RAF) employed the concept *'air control'*, where airpower was used to control areas in e.g. Africa and Afghanistan, where Britain did not have sufficient resources to deploy a large ground force.[25] As the Britons discovered following WWI, airpower is a cost conscious way in which to control remote and large territories. Air forces enable situation awareness and may be swiftly moved from one problem area to another.[26] This capability has been dramatically increased through air refuelling and network-centric warfare since the days of the British Empire. Already in the Interwar Period, however, the British army pointed out that at times airpower can be a blunt instrument.[27] Even with the opportunity for precision bombing, western fighter aircraft have on a substantial number of occasions hit innocent civilians in Iraq and Afghanistan. Most often, they have been regrettable accidents, which the western forces do everything in their power to avoid. Accidents are inescapable, but they damage the trust that is so vital in order for the local population to back up the stabilisation mission.[28]

Airpower can create trust and security, and thus air forces can enable the civilian authorities to carry out the actual stabilisation process. However, fighting is only one function carried out by the air force during a stabilisation mission. Air forces (including fighter aircraft) can carry out surveillance missions[29] and in inaccessible areas such as Afghanistan or Darfur, air transport is vital for the completion of the mission. Precisely because of the infrastructure, the geographical conditions and the security issue, the robust transport capacity of the air force will be very much sought after. Also the ground forces will have a demand for this transport capacity. In an unsafe environment, where operations are carried out over great distances, the prospect of airborne evacuation of the wounded is vital to the morale of the soldiers.

The stabilisation operations in Afghanistan and Iraq has prompted a series of analysts to point out a discrepancy between the ambitions of the US Air Force for very advanced fifth generation fighter aircraft,[30] and the operations actually carried out by fighter aircraft in Afghanistan and Iraq. Max Boot describes how the US Air Force prefers strategic missions rather than tactical, but in real life, the actual tasking has been near the opposite, since 'in just about every conflict since Vietnam, the air force's mission was ground attack.'[31] Therefore, Boot does not think it worth the while to invest in the two new fighter aircraft F-22 and F-35 (JSF). Fixed-winged aircraft or helicopters that can be airborne for a long time and support ground operations are what is needed.[32] It is not necessarily true that asymmetric warfare demands that western forces lower their technological level to meet the opponent at his level. UAV technology and other remote control platforms presumably constitute the military technology of the future; yet in their present form have already been applied with great success in e.g. Iraq and Afghanistan. Even so, many of the advanced technologies that characterise the intended replacement fighter aircraft are not necessary for stabilisation operations. For instance, *stealth* is not necessary in

order to bomb Taliban in Afghanistan. In return, high precision in weapon delivery and the ability to integrate into a network with ground forces to be closely supported are vital properties. Consequently, defence analyst Christopher Bolkcom told the American Congress the following:

> The air dominance and strike missions at which today's tactical aircraft excel are also important to counterinsurgency and other non-state actor operations. These mission, don't however, typically require the high performance characteristics of the combat aircraft that DoD is currently developing and beginning to produce. In some circumstance, aircraft less capable than the F/A-22, JSF and F/A-18E/F may even be preferred for strikes against insurgents owing to their lower airspeeds.[33]

Hence, if the government and Parliament want the Danish Armed Forces to specialise in stabilisation, it would hardly be appropriate to invest in a replacement fighter aircraft able to carry out the same functions as the F-16, only at the technological level of the 21st century. At the cost of one replacement fighter aircraft, the armed forces could expand its transport capacity with several helicopters that would be able to carry out tactical transport of goods as well as soldiers, supplemented by combat helicopters. Perhaps, it could even be considered procuring AC-130 gunships. Such an investment in transport and airpower dedicated to support of ground troops would not only give the Danish Air Force a large capability with respect to stabilisation operations. It would also make it possible to compile a far more uniform special force contribution.

However, up until now, the government and Parliament have wanted an armed force that was specialised not in a specific type of mission, but specialised in 'readily deployable, well equipped and efficient forces for international operations'.[34] Replacing the F-16 with helicopters and gunships would make the Danish ground troops highly efficient for stabilisation operations and other types of operations involving ground troops in a challenging operative environment. The application of this type of airpower would require for other countries to contribute with fighter aircraft for securing air superiority etc. Where a replacement fighter aircraft could be used for stabilisation operations, helicopters and gunships would not in the same manner be immediately applicable to armed diplomacy and armed conflict. In armed diplomacy helicopters and gunships would not be immediately applicable, and in armed conflict they would only be used to the extent where Danish ground forces take part in the operations. Fighter aircraft of the type Denmark is considering to procure instead of the F-16 can carry out far more tasks than specialised air capabilities such as helicopters and gunships (or strategic bombers for that matter).

Fighter aircraft will ensure that the Danish Armed Forces can participate in the greatest number of missions. However, the choice between land support airpower and fighter aircraft is not an 'either/or'. By regarding the replacement of the F-16 as a question of airpower rather than a question of replacement fighter aircraft, the

government and Parliament could opt for compiling an airpower package containing both fighter aircraft and land support platforms such as e.g. combat helicopters. This would not necessarily be cheaper, but it is a political, strategic choice.

Armed diplomacy

In armed diplomacy, a fighter aircraft functions as a tool of communication. Armed diplomacy consists of either direct or indirect threats of using military force, or using it to a limited extent, in order to get the opponent to change his behaviour – to stop doing something, or to reverse something.[35] Sending fighter aircraft into the sky, either as a *show of force* or to bomb selected targets is a kind of megaphone of diplomacy. Armed force is used to amplify the words of the diplomats. Armed force is a signal indicating the words are to be taken seriously, as well as a threat of what can be done if diplomacy leads nowhere. The aim, however, is still diplomacy: The opponent is not to be forced; he is to want to change his own behavioural pattern having realised that the price to pay if he does not may be too high.

Naval and air forces are very suitable tools in armed diplomacy. They are swiftly deployable in remote corners of the world and are not immediately dependent on a deployment area at the border to the country to be coerced. As Major General Leif Simonsen noted in 2004 in his assessment on the future of the Air Force, airpower makes it possible 'to establish and maintain coercion on a regime, without actually being physically present.'[36] Moreover, both naval and air forces are flexible, so their deployment may be used as a signal to the opponent. Air forces, in particular, have the scope to increase the pressure by striking deep inside the enemy territory, but also have the scope to slacken the pressure by, for instance, withdrawing or carrying out less aggressive patrolling.

In 1998 Denmark took part in operation *Desert Fox,* the aim of which was to coerce the Iraqi government through bombing to comply with the demands of the UN weapons inspectors. Denmark's contribution was a C-130 transport aircraft – not fighter aircraft. If Denmark wishes to pursue an activist foreign policy, it would be an obvious choice to provide diplomacy with an armed component. The working group thus writes in the Bruun Report that 'Denmark's military engagement in international conflict management has contributed, as part of Denmark's general, active international engagement with extensive political support, to ensure international peace and stability.'[37] In armed diplomacy two aspects are at stake. One is the object of the concrete diplomatic crisis, and the other is the credibility of the party seeking to weigh his words through military means. Denmark has an unambiguous interest in the present world order being stable and continuing to ensure a stable globalisation that will promote our values and wealth. Armed diplomacy is frequently used to enforce resolutions from the UN Security Council or to otherwise enforce the international legal order. It is very likely that a majority in Parliament will support such missions, and so the Armed Forces must have capability to partake in those missions.

Not only will Denmark often have an incentive to take part in armed diplomacy, but if our allies take part in such missions, it could well be in our interest to take part in order to protect our credibility in relation to our alliances or the UN. There are few areas in which the overlap between active foreign politics and active application of military force is as great as in armed diplomacy. Since armed diplomacy is a communication tool, the actual participation in such missions is a very important signal. The more countries take part and the more active a part they play, the stronger will be the message sent by the mission. Consequently, we will experience pressure from our allies to take part as well as a corresponding political wish to have the capability available for armed diplomacy.

When the Navy's new platforms are operational, they will provide a number of fine options for the government and Parliament to take part in armed diplomacy. Nevertheless, not all armed diplomacy takes place at sea. Fighter aircraft would be a capability that could be employed to an advantage.

In order to work as an efficient diplomatic tool, fighter aircraft must be deployable at short notice anywhere in the world. Moreover, the aircraft must be equipped to operate in close collaboration with the air forces of our allies. Because the aircraft are communication tools in armed diplomacy, the greatest risk for not accomplishing the goal of any given mission is that a misunderstanding will cause the pilot to act differently from the politicians' wishes. For this very reason, it is important that the aircraft has as many and as accurate weapon systems as to carry out exactly the missions that correspond to the intended political message.

Probably the government and Parliament will, in the next 30-40 years, feel the need to take part in armed diplomacy. Fighter aircraft would be an obvious capability to use on such missions. However, these missions will make huge demands with respect to the type of fighter aircraft, the Air Force can provide. It will be vital that the fighter aircraft can work smoothly together with aircraft from other coalition participants, and that the fighter aircraft are on a technological level where they will be able to carry out with great precision the tasks the politicians in charge find diplomatically necessary.

Although fighter aircraft are both suitable and popular for armed diplomacy, fighter aircraft are not the only applicable platform. In many cases, ships will be just as important a part of the armed diplomacy efforts. Since Denmark has decided on quite an ambitious extension programme for the Navy, one option could be to count on the Navy alone as Denmark's contribution for armed diplomacy However, this would impose a significant limit to the freedom of the government and Parliament with respect to the choice of missions and platforms for international missions.

Armed diplomacy is about bending the will of the opponent so that he makes concessions at the negotiation table as the threat of armed force makes him realise that negotiations is the most appropriate solution. However, time and time again it has proven difficult to communicate through armed force. Almost for as long as aircraft has

been used on military missions, there has been an exaggerated faith in the power of air force to bend the will of the opponent.[38] Yet the truth is, that air force is a blunt instrument, which can destroy physical objects very efficiently and over great distances. However, the political effect of such destruction is far less tangible. If the politicians merely wish to send a message, they should, according to military researcher Benjamin Lambeth, consider using the postal services rather than the Air Force.[39] Since messages are rarely adequate to decide a conflict, engagement in armed diplomacy often leads to engagement in an armed conflict. This then, is the next application for fighter aircraft.

Armed conflict

In 1999, Danish F-16 were part of the NATO *Operation Allied Force,* the purpose of which was to weaken the regime in Beograd that had landed Yugoslavia in a civil war, and more specifically to prevent a genocide in Kosovo.[40] The air war over Kosovo is a fine example of the application of fighter aircraft in the armed conflicts of today.

An armed conflict differs from armed diplomacy by the fact that military force is used to impose a political goal as opposed to being used as an element to coerce the opponent to change his political actions by his own accord. *Operation Allied Force* shows how blurred the line between diplomacy and conflict can be. The intention of the allies was to deploy the NATO air forces for armed diplomacy, but as the conflict came to a head the logics of war rather than of diplomacy ruled the events. From that moment onwards, the application of the NATO air force became strategic. During an armed conflict, airpower is strategically used to reduce the opponent's ability to continue fighting to such an extent that this alone makes the opponent give in, or it weakens the opponent so that other military operations can force a decision.[41] Because of the strategic context in which they were used, the Danish F-16 aircraft taking part in *Operation Allied Force* were used differently from the Danish F-16 used as tactical support for ground troops in Afghanistan in 2001-3. Tactical application of airpower can take place in many types of missions, and the application of the aircraft will conform to the logic of the given mission. Hence, in Afghanistan the application of aircraft conformed to the logic of the armed stabilisation mission. Nevertheless, it is primarily in armed conflict that airpower is offensively strategically applied. Strategic transport like the Berlin Airlift and *shows of force* are examples of different ways of achieving strategic effects through the means of airpower. From this point of view, the F-16 aircraft in *Operation Allied Force* were more 'at war' than the aircraft over Afghanistan, even though the aircraft taking part in the operation were primarily doing patrolling tasks whereas the aircraft in Afghanistan were bombing.[42]

Strategic application of airpower seeks to exploit the technological opportunities made possible by using aircraft to attack the enemy deep inside his own territory. Since WWI the air forces have sought to exploit this opportunity, though technology has not always been able to keep up with strategy.[43] However, a number of aviation strategists

now argue that, for the first time, application of fighter aircraft in network-centric warfare – through accurate and swift information about targets as well as the means with which to hit them – it has become possible to realise the ambitions of victory through bombing. Strategist John Warden believes that the opponent should be viewed as a system. The opponent's system ensures that society works, that the armed forces are capable of fighting and that the government is able to command the armed forces. Separately, the armed forces, the ministries within the government, industrial corporations, TV stations and other parts of civilian society may very well work, but they are unable to fulfil their societal functions if they do communicate with each other. If the individual components cannot communicate, the resources of the society cannot thus be channelled into the fight – and politicians and officers who are unable to establish contact with each other or their troops cannot fight. Consequently, Warden's target for strategic air warfare is to bomb the communication lines of the system in order to isolate the individual components of the system so that the societal system no longer works. Having thus paralysed the society, you leave the opponent with the choice of initiating negotiations or preparing for an attack by other military forces, which he does not have the system to counter.[44]

NATO was too hesitant and political in their selection of targets to adhere to all of Warden's principles during *Operation Allied Force,* but the over-all target of the operation was to paralyse 'the Serbian system'. In Afghanistan in 2001 and Iraq in 2003, the US Air Force pursued a similar doctrine for strategic bombing in the initial phases.[45] When airpower is thus used for effect-based bombing, it is of vital importance that the fighter aircraft involved in the operation are capable of bombing with a precision that enables them to hit exactly the right components of the opponent's system. However, the systemic thought is equally valid for the completion of allied air operations. As previously mentioned, fighter aircraft should be an integrated part of the network-centric warfare of the military system in order to make the best possible use of the fighter aircraft capability. It has become possible today to carry out systemic operations for the very reason that targets can be identified and hit with such precision, that very few aircraft now can carry out the same operations that required hundreds of aircraft during WWII.

During *Operation Allied Force* the Europeans contributed approx. 40 per cent of the aircraft, yet carried out only 17 per cent of the bombing raids.[46] The reason for this was, that the European aircraft were not as compatible in the network as the American aircraft and they did not bomb with the same precision. At the same time, it is worth noting that precisely because the levels of information and precision are so high, it is now possible to have a large degree of political control over the targets to be bombed. During *Operation Allied Force,* this entailed that the political input to the military network was so massive that, according to the view of the US Armed Forces, the air operations were impeded by it. The result of *Operation Allied Force* was increased pressure on the Europeans to update their air capabilities through the procurement of new technology or in the

long-term new aircraft.[47] If the Americans want the allies to contribute to their air operations, it is thus necessary for the allies to invest in the material required. The JSF programme should definitely be seen in this context. As the American Defense Secretary William Cohen noted: '[JSF] is also critical to the modernization of our ally forces for coalition warfare.'[48]

Where the USA is thus adding pressure to get their allies to update their aircraft so they can carry out meaningful collaborations with the Americans, another lesson to be learned from Kosovo for the US Armed Forces has been a widespread scepticism for coalition warfare at the strategic level. In Afghanistan and Iraq they were open to receive allied contributions of forces (including fighter aircraft), but they were invited to take part in tactical missions only and not until the decisive strategic air operations had been completed.

The only exceptions were British and Australian contributions. British aircraft and vessels took part in the initial strategic operations in both Afghanistan and Iraq, and Australian fighter aircraft took part in the initial strategic operations in Iraq. This indicates the capabilities of the Britons and Australians to enter into American network operations, but it also indicates the American assessment that including the British and Australian political levels in their network would not impede them. Whether or not the allies can partake in strategic air operations is thus (also) a political decision. Future American Administrations may very well decide that the political benefit of including allied participation might be greater than the present American Administration has done.

If a future American Administration values allied participation in strategic air operations, this would clear the way for Danish participation – should the government and Parliament so wish. In this case, fighter aircraft would be a capability that could fulfil the ambition of the Bruun Report that 'the future characteristic of the engagement of the Danish Armed Forces in international operations would be capabilities for swift deployment of short-term and focused contributions'.[49]

In order to participate in strategic operations it is necessary to invest, not only in aircraft, but also in a range of other capabilities, enabling the aircraft as a platform to enter into a Danish or allied network. If a Danish fighter aircraft is to have the capability to enter strategic operations, it is of vital importance to invest in the necessary support, communication, sensor and weapon systems, and to ensure that the fighter aircraft is able to be part of the very networks in which we anticipate to operate.

Over and above the concrete operative capability, the capability to partake in strategic operations will give the Danish Armed Forces concrete access to take part in the development of future network-centric warfare. During the approx. 30 years when any new Danish fighter aircraft will be operational, a massive technological development is bound to take place, though the development of doctrines for network-centric warfare will probably be even greater. In order to achieve the full benefit of such technologies and doctrines, an armed force must have a concrete incentive for using

them, and without fighter aircraft the Danish Armed Forces would not have such a concrete incentive.

In the near future it may not constitute a concrete problem for the Danish Armed Forces, should Denmark not be part of the development of network-centric operations in the field of airpower, since others can supply this capability on the missions in which Denmark takes part. In the long term, however, it would be a problem if Denmark were left unable to defend herself on the air strategic level. According to the Bruun Report Denmark must, among other things, take active part in military transformation in order to establish 'a basis such that the Danish armed forces can be developed into a defence against any future attacks from a foreign power, should such a threat reappear.'[50] Should such a threat indeed reappear in the vicinity of Denmark, the Armed Forces would have a tangible incentive to be able to maintain air superiority in Danish airspace and in similar strategic manners to be able to deploy the Air Force through interdiction and deterrence.

Even in a national crisis – where huge resources can be mobilised – a fighter aircraft capability would be far too technologically, organisationally and doctrinally complex to be rebuilt quickly. This not least because a vital element in the capability is its ability to enter into the joint network constituted by the Armed Forces. Exactly because the Air Force is a central component in the military network, the joint capability of the Armed Forces to defend Denmark against a direct, conventional military threat would be considerably impaired in the absence of fighter aircraft capabilities.

A defence with no concrete experience of network-centric warfare, in which airpower is a decisive element, would probably find it very difficult to adjust to the next generation of military technology, which will involve increased integration of many different types of platforms. Part of those future military platforms will be unmanned aircraft, which will blur the distinction between air force and ground troops, since they will be able to provide close air support to ground force operations. In other words, retention of a fighter aircraft capability contributes to ensuring Danish access to technological, operative and strategic developments as well as an organisational continuity within advanced airpower.

04 The political choice and its consequences

At the time when Denmark decided to procure F-16, we were facing a concrete threat, which made our need for fighter aircraft tangible. If the Warsaw Treaty countries decided to attack Denmark or our NATO partners, what would we need? In such situations under severe strategic pressure, countries have very little scope for deciding which military technology to invest in, and how they are going to use it. They are compelled by their opponents, in the sense that their military capabilities must counteract the capabilities of the opponent. Today, the strategic pressure on Denmark is very slight which results in a large degree of freedom of action. To a large degree Denmark chooses her the conflicts, and consequently can choose the military capabilities to be procured.

The most recent defence agreement manifests the consequence of the absence of traditional threats against Danish territory by opting for the development of armed forces to be deployed abroad. This choice is linked to the recommendations of the Bruun Report, that Denmark must be able to take part in the full spectrum of missions. The Armed Forces are viewed as a toolbox that must be able to provide the appropriate tools for the government and Parliament. However, the tools of war are very expensive, and so a focus on deployable capabilities also entails specialisation in certain capabilities. In a world of change with many potential missions, the Armed Forces basically need all the tools, but no country, and least of all a small country, has the opportunity to procure all potentially necessary military capabilities. One has to choose, and when the choice is made, the Armed Forces specialises in a range of capabilities. The main idea behind the present defence agreement is to make choices with regard to procuring material etc. to ensure that the Armed Forces will be able to provide complete contributions to international missions. Hence, it is not enough to be able to deploy a capability – it must also fit into the joint network of the Armed Forces.

The strategic freedom of choice currently enjoyed by Denmark and the rest of the western world risks becoming a pretext for doing nothing. It is therefore important to uphold flexibility and continuity

when making strategic choices. Even so, the freedom of choice is in many ways real in that Denmark can opt to compile her contribution to international security in various ways.

This freedom of choice is amplified by the fact that Denmark does not deploy armed forces on her own. Danish forces take part in coalitions, and so Denmark can contribute in many different ways. Most missions consist of many elements, which the government and Parliament can pick and choose from, when deciding on the Danish contribution. Likewise, Denmark can choose a civilian or military contribution, or a combination of the two.

A government contributing fighter aircraft to coalitions will acquire the same freedom that Francis Bacon, in his day, believed was granted those who opted for sea power. Supplying fighter aircraft as well as navy vessels, you can 'choose as much or as little of the war, as you desire'.[1] Fighter aircraft is a very visible contribution affording the government and Parliament the opportunity to send out an unambiguous signal, and fighter aircraft are nowhere near as vulnerable as ground troops or civilian staff.

As mentioned in the introduction of this report, the government and Parliament must consider five basic political options. The first of which is: Should Denmark retain a fighter aircraft capability? If the answer to this question is yes, a further four political choices must be made. How to make this decision? The size of such capability? Which type of fighter aircraft to choose? When to make those decisions? This chapter is about the consequences of those choices. How to make the decision is naturally a part of the other decisions, but we shall begin with a specific element in this, i.e. what consequences a business-political basis for the decision could have. We then discuss the consequences the choice of any given fighter aircraft will have on our ability to collaborate with our allies. Finally, we discuss the consequences of postponing or divide into phases the decision to procure a replacement fighter aircraft.

Consequences of a business-political basis for the decision

Denmark finds herself in a beneficial security-political situation, in which it is the country's own considerations that form the basis for the organisation of the armed forces rather than the immediate need caused by a threat. Hence, it would be tempting to add other criteria than merely defence-political ones to the decision of whether to invest in a fighter aircraft. Thus on 13 November 2006, the Minister of Defence explained to Parliament's defence committee that even if Denmark was never to purchase a single F-35 aircraft, participation in the Joint Strike Fighter project would still be a good idea seen from an business-political point of view.[1] Where the Minister of Defence thus upholds a clear-cut division between a decision to procure replacement fighter aircraft and any potential business interests from a huge and high technological project like JSF, there has been en tendency in the general debate to jumble the business-political and defence-political levels.

In this connection it is important to distinguish, whether orders to Danish enterprises in connection with the purchase of replacement

fighter aircraft would be beneficial to the individual enterprise or beneficial to the national economy. Where the individual enterprise will enjoy at least a short-term benefit by having secured an order in multinational weapons production, this order to the enterprise will only benefit the national economy, if the order does not increase the total costs to be paid for the aircraft by the Danish government. Moreover such orders are only beneficial to the national economy if they entail production activities that would not otherwise have taken place and which do not replace other production activities that would otherwise have taken place. It is doubtful that any benefit that might come about as a result of the investment in fighter aircraft would be greater, than if the same amount were used instead on investments in infrastructure or other activities, which would increase the performance of the economy and promote competitive strength. Therefore, a beneficial effect on the national economy can be a bonus in the decision to purchase a replacement fighter aircraft, but should never be the only justification for the purchase.

Would it be more sensible to use the purchase of the replacement fighter aircraft as a means of supporting the Danish defence industry? Support to the defence industry can either be for purely political reasons or based on strategic considerations to secure continuity within an industrial base with knowledge of particular relevance to defence with a view to any potential future crises. Yet, the technological development within industrial production for defence purposes entails that it is difficult to imagine that in the future, Denmark could become self-supportive with respect to weapons systems. The western defence industry is characterised by very large corporations with just as large budgets for research and development, all of whom are in very close contact with their own governments. The complexity and the costs of developing platforms of the present and the future exceed the opportunities of the Danish economy by far. Therefore, it is not a good argument either to point out that Danish support to her own defence industry contributes to the continuity in the combined western defence industry, since this will be secured in any case.[1]

Finally, it is in Denmark's interest to pursue a defence policy. Defence politics are about anticipating future risks in as cost consciously a manner as possible. This should enable Denmark to minimise as many risks as possible and as efficiently as possible. To deliberately pursue defence politics in a less efficient manner – like for instance by pursuing part of defence politics as business politics – is not in accordance with the basic intention of defence politics. This does not mean, that Denmark should not attempt to maximise income and technology transfer in connection with industrial agreements; it simply means that such aspects should not be part of the strategic decision. Hence, Denmark should only base any decision to procure new fighter aircraft on strategic factors. Considerations concerning indirect support to national industries should not be part of the assessment.

Consequences of purchase in relation to partners

Today, the Air Force has eight aircraft ready to be sent on high alert and another eight on a lower alert.[1] The assessment of Air Tactical Command is that this does not allow the capability for a large independent contribution, but that as a general rule, Danish aircraft have to be sent out as part of multinational air force.[1] Since we can hardly expect to procure more replacement fighter aircraft than the present fleet of F-16s, we have to presume that any replacement fighter aircraft are to be sent out together with fighter aircraft from other countries. Consequently, it is important to assess when deciding on investing in a replacement fighter aircraft, how compatible the given type of aircraft will be with the coalition networks, we envisage joining on missions.

Moreover, the fighter aircraft chosen by our partner countries has consequences for Denmark, who is part of European Participating Air Forces' (EPAF) Expeditionary Air Wing (EEAW), which is a collaboration between Denmark, Norway, Portugal, Holland and Belgium. They are all small countries flying F-16. The countries do not have an operative fighter aircraft capability that could be deployed on its own, but together they can deploy approx. 30 F-16 aircraft and handle the logistics required to get the aircraft to the area of operation and keep them airborne once they are there.[1]

When deciding on replacement fighter aircraft it would thus be vital to ensure that collaborations like the EPAF/EEAW can continue. This would be even more important, if the Danish assessment of the need for airpower capabilities concludes that Denmark should opt for a smaller number of aircraft than the eight plus eight that can be deployed today. Regardless of whether a replacement fighter aircraft might be more advanced than the F-16 and thus balance quantity with quality, a smaller capability and support structure would be even more dependent on operational collaboration.

In short, the choice of replacement fighter aircraft of other countries has consequences for Denmark, and Denmark's choice has consequences for other countries. A number of countries purchased F-16 at the same time as Denmark, and consequently, many air forces are about to buy new aircraft. Hence, there is some uncertainty involved about who decides on what and when.

If you look at three potential replacement fighter aircraft, the number of aircraft, the manufacturers intend to produce and which governments have just bought or plan to buy a given aircraft, it will give an indication of which collaboration partners we are going to choose, when we decide on an aircraft.

Lockheed Martin has declarations of interest for approx. 3,100 F-35 (JSF). Australia, Great Britain, Canada, Italy, Holland, Norway and Turkey take part to different degrees in the project alongside Denmark, and although this participation is no guarantee of a purchase, it is an indication of interest.[1] Great Britain, Italy, Germany and Spain are expected to purchase 620 Eurofighters. In addition, Austria have ordered 15 (and Saudi-Arabia 72).[1] Sweden has 204 Gripen of various models. In addition, the Czech Republic and

Hungary have each leased 14 (a total of 28), and the Republic of South Africa has ordered 26 Gripen.[1]

Holland and Norway, who are two of our partners in EPAF/EEAW, thus consider F-35. Both countries have, like Denmark, an official open choice of type with several candidates, and both are facing having to make the decision in 2008.[1] This illustrates very well the advantage necessarily enjoyed by the large manufacturer. (Belgium has decided for the time being not to be part of the development of JSF, and as recent as 1999, Portugal procured more F-16 aircraft). It is simply more probable that Denmark's partners are going to procure F-35 than Gripen. This does not mean that the Air Force would not be able to establish a meaningful operative collaboration with others, if they buy anything other than F-35, nor does it in itself give any indications about the properties of the aircraft. If the intention is to send out the aircraft, however, it is necessary to carefully investigate whether there are any partners to send it out with.

EPAF/EEAW only make the absolute minimum of arrangements to enable the deployment: In order for the 30 aircraft to be able to operate in e.g. Afghanistan, it is required that other coalition partners (usually the USA) is able to provide air refuelling etc. In order for a replacement fighter aircraft to be de facto deployable, it is required to be immediately compatible with an allied network. Hence, the Air Tactical Command is probably right, when in its study of replacement fighter aircraft it concludes 'that it is useful to operate with a platform used by other regular collaboration partners in an alliance context (NATO and EPAF/EEAW) in order to be better able to enter a binding operative collaboration with respect to deploying the capability'.[1]
Although this conclusion is straightforward from an operational point of view, it gives rise to a series of political challenges in the process. The government and Parliament should not only make their own choices about the platforms that are to constitute Danish airpower in future. This choice will very much depend on the choice made by a number of other small NATO member states, and their choices, in return, depend on the Danish choice.

Consequences of postponing the decision

Consequently it is not without significance, when Denmark makes her decision. It could be argued, that participation of the JSF project in itself is one way of securing partner countries. Even so, there is still so much uncertainty surrounding the project that participation in itself does not guarantee the purchase of aircraft. The longer Denmark waits before making the decision of which replacement fighter aircraft to procure, the more certain one will be about what other countries invest in, and the longer one waits, the better idea one shall have about costs and capabilities of Gripen and F-35, both of which are still being developed. In addition, the long expected lifetime of a replacement fighter aircraft is in itself a challenge – both with regard to the strategic uncertainty and to the development of UAVs.

As the situation is now, the stage is set for Denmark having to make a decision within a very few years about the procurement of replacement fighter aircraft. If this decision includes a huge capability, the Armed Forces will have this at their disposal for a long time to come, but conversely they will have limited scope for making new choices later on in the lifetime of the replacement fighter aircraft.

There are two types of uncertainty involved with the time line of the decision process. One type of uncertainty concerns challenges connected to delivery reliability and choice of partners for any given replacement fighter aircraft. This type of uncertainty will last for less than ten years – and it varies from type to type of the three types of replacement fighter aircraft. Particularly with respect to JSF there are two loose ends, which are closely connected. First of all, there is the uncertainty mentioned about the time schedule for development and production, including the final costs.[1] Secondly, there is the question whether our central collaboration partners – strategically and operatively – who are involved in the JSF project will actually follow up by procuring JSF. This includes the British considerations concerning JSF contains a 'plan B' in case the JSF version for the British carriers is not developed satisfactorily. In that case, they will develop a 'sea-based' version of the Eurofighter.[1]

The other type of uncertainty concerns strategic uncertainty in relation to which types of missions will become dominant, including the development of new mission defined needs. This uncertainty will increase during the entire lifetime of the replacement fighter aircraft. Also, the latter half of the period will be the time when new technologies, including UAVs, are likely to be established alternative platforms.

The further ahead we look, the less certain we can be that we have made the right choices. Above all, this means that one way of securing the decision for the future is to divide it up into smaller parts. Consequently, it would be relevant to consider whether the final decision on a replacement fighter aircraft needs to made before 2010.

This kind of strategic latitude can be built into the decision process with respect to both types of uncertainties, be it the one linked to the delivery situation or the one linked to the more long-term strategic uncertainty.

As mentioned above, attention to organisational continuity is a significant factor in advanced Danish airpower. If the aim is that Denmark should possess advanced airpower in the middle of the century, it would be unthinkable to imagine a model, whereby the Air Force skips an entire generation and consequently does not have advanced capabilities at their disposal, until the next generation fighter aircraft or UAVs are ready. The costs involved with the organisational regeneration would far too great. The strategic latitude must then be created based on the fact that Denmark should retain a minimum of advanced capabilities in airpower as it appears today and subsequently build onto that.

With regard to the delivery situation, uncertainty can be limited by waiting until delivery as well as the choice of partners has been clarified. It is possible to wait, since the lifetime of the present F-16 can be extended by restructuring the flying time. The phasing out of the F-16 is planned in response to the fact that the costs of keeping the aircraft airborne increase heavily after a particular number of airborne hours. However, the number of airborne hours does not have to be a constant. Perhaps the total number of airborne hours cannot be reduced, without simultaneously reducing domestic training and education or the deployable capabilities. In this connection it should be investigated whether it is possible to buy training and education somewhere else for all or part of the period.

By stretching the lifetime, possibly in combination with extra costs and reduced deployability, one could probably postpone the decision at least until the preparations for the next defence agreement in 2015-2019. However, it is a political decision to accept potentially reduced capabilities until the situation has been adequately clarified for the final decision to be made on an appropriate basis. But the advantage would be acquiring a greater degree of certainty for making the right decision – whereas the drawback might be that the opportunities for taking part in international operations would be limited during this period.

In relation to the long-term strategic uncertainty, it is presently important for Denmark to have extraordinary latitude with regard to our strategic choice. Part of this strategic surplus we could choose to invest in greater future flexibility, for instance by deliberately investing in a very limited fighter aircraft capability with a view to reassessing the long-term geo-political conditions and mission requirements already in 20-25 years. Irrespectively of which type is chosen, this decision would create greater latitude with regard to the future technological development in advanced airpower, including unmanned aircraft. This decision entails taking some strategic risks earlier on in the course of events with a view to obtaining greater strategic flexibility at a later time. A smaller fighter aircraft capability as described, would need to be of at least limited deployable extent in order to be strategically meaningful to Denmark. Moreover, this option should be offset against the present need for fighter aircraft and alternative airpower platforms for the operations of the other forces including the special forces.

These two methods of addressing the time-related uncertainties in connection with the decision do thus not exclude each other, but may in various ways complement each other.

05 Conclusion: Towards a well-founded decision

Denmark has a need for a fighter aircraft to replace the F-16. The question is, what are the actual Danish needs? This is an important question, because the three different types of mission, which the government and Parliament are expected to want to contribute to in the next 30-40 years until any replacement fighter aircraft is phased out, make different demands to airpower. Therefore, a precondition for making a qualified decision about Denmark's requirement for fighter aircraft is that the government and Parliament assess the overall need for airpower. Only then will it make sense to consider which type of replacement fighter aircraft the Armed Forces need and how many aircraft the government and Parliament should grant.

In armed stabilisation, airpower forms the basis for deploying relatively few troops, whilst still being able to provide a secure framework for the building of a new nation. In this situation then, there is a basic requirement for fighter aircraft. Even so, a greater requirement could be for transport aircraft and helicopters for both the military and civilian parts of an armed stabilisation operation. Transport is a very costly capability, and the demand is far greater than the capacity. Consequently, the effect of Denmark's contribution of transport aircraft could be greater than a contribution of fighter aircraft, provided that other nations are still prepared to provide fighter aircraft. However, transportation of troops and goods can be quite dangerous during stabilisation missions, and thus combat helicopters or perhaps even AC-130 gunships might also be significant contributions – not least for supporting Danish ground troops. An investment in this type of air capabilities would also strengthen the Danish special forces.

With respect to armed diplomacy, fighter aircraft in combination with warships are capabilities that would typically afford the government and Parliament opportunities for complementing diplomacy with armed force. Also ground troops can contribute to this to some extent. This could be fundamental to ensure that our diplomacy consists of more than just words, but it could also be necessary in order to show that Denmark is a loyal ally or a committed member of the UN. Fighter aircraft can thus be a diplomatic tool in relation to

both our friends and enemies. However, fighter aircraft are not alone in being able to carry out this task. The Navy has capabilities that can carry out the same diplomatic functions. Still, fighter aircraft can be swiftly deployed and carry out a wide range of tasks during such a mission.

In an armed conflict, securing air superiority and thus the ability to carry out strategic air operations are vital in order to win. The initial phases of an armed conflict may well primarily be dominated by the application of airpower, and in such a scenario fighter aircraft will play an important part. Whether Denmark is going to partake in this part of the operation is not a decision based entirely on our own desires, but is also based on whether the allies want Danish participation. The assessment of the given American administration at any time of Denmark – politically as well military – is always going to be important in this context. If Denmark contributes to an armed conflict with ground troops, it could be vital that they can be supported by e.g. combat helicopters.

As our analysis of the need for airpower in the various types of missions reveals, fighter aircraft of the type presently considered as a replacement for the F-16 is a military capability that is relatively easy to deploy, and is able to carry out a wide range of functions. Consequently, such fighter aircraft can be applied to all types of missions, which in itself is an argument in favour of procuring a replacement fighter aircraft. A small country with limited resources must, wherever possible, procure military capabilities with a wide range of applications, so that one platform can carry out several functions simultaneously. This obviously means that the Danish Air Force, even with a replacement fighter aircraft, will not be able to provide customised capabilities to particular missions in the same way that the US Air Force is. This could be a strength and a cost effective way in which to run the Armed Forces, but at the same time, the risk is of procuring platforms with applications of such a general nature, that in reality they are not very useful. In order to avoid this, it is important to have a clear idea of the tasks to be carried out by the Danish Air Force, and decide on the replacement for the F-16 based on this idea, rather than on a desire to have a new fighter aircraft as a replacement for the old one. Viewed from this perspective, the replacement of the F-16 becomes a chance to consider how the Danish forces should use airpower.[51]

The great challenge in relation to the choice of replacement fighter aircraft is thus politico-strategic: What kind of defence does Denmark want to have? This report neither can nor should give a full account of this matter on its own. The type of airpower Denmark should opt for is a political decision. Hence, a thorough political and defence-related debate is required on the future Danish defence, including any needs for airpower. The question of replacement fighter aircraft would be a natural and vital part of this debate, and cannot, in fact, be determined solely based on the analysis of this report. Consequently, our recommendations include both the necessity for such a debate and analytical account, and the option to postpone at least part of the concrete decisions until this process has taken place and constitutes a complete background. Based on this, the obvious

choice would be to include the decision of which type of airpower should replace the F-16 in a future defence agreement.

However, including a replacement fighter aircraft in the agreement process could harbour its own problems, since, if the huge material investment becomes part of the Armed Forces' regular budget, it could well result in cutbacks elsewhere in the Armed Forces. Considering the heavy demands international missions have made of the Armed Forces, this would hardly be apposite.

There are many potential solutions to how Denmark should organise the Air Force in the post-F-16 era. A discussion of airpower could take many different paths according to which missions one feels Denmark should take part in and according to a personal assessment of the military technological development. Based on our mission analysis, however, one can envisage three different models that give different priorities to airpower and missions. The models are thus short examples of strategic visions for Danish airpower. If one wants to make a cost evaluation, it is important to keep in mind that each type of platform requires its own support structure, and that for each type of platform, there is a minimum critical number of platforms with respect to deployability.

We do not recommend any of those models, but they illustrate the choices faced by the government and Parliament.

The night watch model. This model affords Denmark a fighter aircraft capability sufficient for maintaining a deterrent readiness and to carry out patrols in Danish airspace in case of increased alert. Considering the present Danish security geography, this would be adequate to ensure our sovereignty and just enough to ensure that the Air Force maintains expertise in fighter aircraft. The resources of the Air Force are primarily used on transportation of ground troops, who in return receive equipment for the funds saved by not investing in a large number of fighter aircraft. The model is based on the assessment that Denmark should specialise in deploying ground forces in stabilisation operations. It may be supplemented by an assessment that the aircraft of the future is unmanned, and that in the long term Denmark wants to procure an air capability consisting of UAVs.

The air support model. This model is based on the idea that the role of airpower is to provide tactical support to army units. Since the Danish army will probably be primarily involved in stabilisation operations in the foreseeable future, it will be the role of the Air Force to support those missions in the best possible manner. Fighter aircraft can be used for this purpose, but they are not the only capability required. Consequently, by using this model, Denmark will be investing in a smaller number of fighter aircraft than the present fleet. Those multi-function fighter aircraft may not need to be the most advanced on the market, because they are mainly to uphold Danish sovereignty and to be applied in stabilisation operations. The Danish fighter aircraft will not be facing advanced opponents in either of those cases. What is thus saved by purchasing fewer and perhaps less advanced aircraft, could in return be used for increasing the Air Force's capability with regard to transport and close air

support e.g. in the form of helicopters. By thus specialising in air support for ground forces, the Air Force would furthermore be able to contribute a more complete special force capability, if using this model.

The air warrior model. Using this model Denmark maintains her present fighter aircraft capability (8+8). This model is based on the assessment that airpower is so vital in armed conflict in the 21st century, that the Armed Forces would not be an up-to-date military network, if the Air Force does not have a fighter aircraft capability. According to this assessment, Denmark is going to opt for the most advanced fighter aircraft to replace the F-16 and to work actively to secure partners for collaboration on the operative application of the aircraft. If this model is used, fighter aircraft are thus a capability to be applied to all types of missions, though armed conflict is clearly viewed as the most important type of mission. Preparing for armed conflict will in turn provide the capabilities to take part in armed diplomacy. The air warriors will measure the Air Force's replacement fighter aircraft against the leading air forces of the world, and so the Air Force will conscientiously follow the technological development, even if it means an increase in capability for fighter aircraft if they are used in combination with UAVs. However, the general belief according to this model is that the unmanned aircraft belongs in the distant future.

Regardless of whether the government and Parliament opts for one of those models or perhaps a fourth solution we would recommend the following:

Denmark should retain a fighter aircraft capability of sufficient size to enable periodical participation in international missions, while also maintaining a deterrent readiness as an integrated part of 'homeland defence'.

The type of fighter aircraft to be procured and the number of fighter aircraft required by the Danish Armed Forces is to be assessed based on a complete analysis of the role that airpower should occupy in the Danish Armed Forces. Hence, the decision on replacement fighter aircraft must include considerations of whether fighter aircraft are to be complemented by other types of airpower capabilities (e.g. combat helicopters).

When deciding on the type of replacement fighter aircraft, the government and Parliament should carefully consider that the choice of fighter aircraft could strengthen and develop the options for operative collaboration with our allies.

The decision on which air capabilities the Danish Armed Forces should possess, should be a decision singularly based on defence politics. Considerations concerning indirect support to national industries should not be part of the assessment.

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Notes

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[1] United States Government Accountability Office *Joint Strike Fighter. Progress Made and Challenges Remain*, Report to Congressional Committees, March 2007, p. 22. The price of each individual fighter aircraft is only one of several factors that may vary. The total costs in the lifetime of the aircraft vary according to e.g. optional accessories, maintenance model, required flying time etc. This applies to all three types of candidates. However, the JSF programme is particularly unpredictable.

[2] Air Tactical Command base their studies on new fighter aircraft on a lifetime of 35-40 years, as has been the case with the F-16 after a lifetime extension halfway through the operation time of the aircraft. For obvious reasons, it can be difficult to predict the possible extension of the lifetime of the aircraft. Flyvertaktisk Kommando, *Delstudie vedrørende Fremtidens Kampfly*, november 2005, reviderede udgave january 2006, p. 31.

[3] Flyvertaktisk Kommando, Delstudie vedrørende Fremtidens Kampfly, p. 6

[4] Peter Goon, 'Affordability and the new air combat capability', *Defender*, Winter 2005, p. 33. Cf. also the assessment from *Centre for Strategic and Budgetary Assessments*: "While it is beyond the scope of this report to estimate what a sensible F-35A/F-16 replacement ratio might be, it seems clear that one-for-one is too high. The maturation of guided munitions and battle networks argues that fewer advanced fighters will be needed in the future than were required in the prior era of industrial-style warfare in which most munitions missed their aim-points or targets", Koziak and Watts, p. 45.

[5] Frank Finelli, 'Transforming Airpower', *Airpower Journal*, Summer 1999 [www.airpower.maxwell.af.mil] (16 January, 2007).

[6] Alan Stephens, *The Australian Defence Force and Regional Air Superiority*, a submission to the Joint Standing Committee on Foreign Affairs, Defence and Trade Inquiry into Australian Defence Force Regional Air Superiority, January 23, 2006, p. 3.

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[10] Add to that e.g. *show of force* and intelligence, surveillance and reconnaissance (ISR), which, however, are not necessarily specific fighter aircraft functions.

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[13] James Fallows, 'Uncle Sam buys an airplane,' *The Atlantic Monthly*, June 2002, Vol. 289, No. 6.

[14] Congressional Budget Office 'The Long-Term Implications of Current Defence Plans and Alternatives: Detailed Update for Fiscal Year 2006', January 2006, p. 36.

[15] De sikkerhedspolitiske vilkår for dansk forsvarspolitik, Udenrigsministeriet, august 2003, p. 38.

[16] De sikkerhedspolitiske vilkår for dansk forsvarspolitik, Udenrigsministeriet, august 2003, p. 37.

[17] Consult QDR 2006 for more information on the plans for (conventional) "long range strike systems", including ground and airborne as well as the present and next generation. United States Department of Defence, *Quadrennial Defence Review Report*, 6 February, 2006, p. 46. [http://www.defenselink.mil/qdr/report/Report20060203.pdf].

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[29] Flyvertaktisk Kommando, Delstudie vedrørende Fremtidens Kampfly, pp. 28-9.

[30] For information on fifth generation fighter aircraft, see Karl Agnar Selanger and Gjert Lage Dyndal, 'Teknologi og generasjoner', *Norsk Militært Tidsskrift*, Årgang 177, 2, pp. 21-7.

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[32] Ibid.

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[46] Lambeth, NATO's Air War for Kosovo, p. 33, p. 66.

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[48] Cohen quoted in Assessing Competitive Strategies for the JSF, RAND, p. iii.

[49] De sikkerhedspolitiske vilkår for dansk forsvarspolitik, Udenrigsministeriet, august 2003, p. 28.

[50] De sikkerhedspolitiske vilkår for dansk forsvarspolitik, Udenrigsministeriet, august 2003, p. 42.

[51] One very central question in connection with the decision on replacement fighter aircraft is, whether any grant will affect procurement of other material in the Armed Forces. One can only guess at the answer to this, but since we are talking about a huge budget, it is probable that such a grant would affect the purchase of equipment to other parts of the Armed Forces.