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THE EUROPEAN ARCHITECTURE FOR SPACE AND SECURITY

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Background

The notion of space and its link to security has been gaining importance in the last years. A growing awareness of the potential of space and its applications, along with old and new kinds of threats have brought analysts, decision makers and executive bodies to think about the optimum way of bringing the domains of space and security together. The upcoming fifth European Space Council will address the issue of space and security, and the French Presidency of the European Union in the second half of 2008, putting emphasis on space issues, is bound to address security and defence as one of four key priorities. The European Space Agency Council at Ministerial level in November 2008 is also scheduled to discuss ways to meet Europe's security and defence needs.

As demonstrated by official documents, Europe as a whole (in addition to its Nation States) is starting to allow itself the utilization of space for security purposes. The European Space Policy, for example, establishes a link between space activities and the European Security and Defence Policy. Containing a distinct chapter on security and defence, it recognizes that space technologies are often dual-use in nature and that Europe can pursue the respective synergy, particularly in the domain of security. It also affirms the need to set up a structured dialogue with the relevant bodies.

The European institutional set up for space activities in the security domain is adapting to the new situation. The Lisbon Treaty foresees space as a shared competence within the European Union, and the European Space Agency has been re-interpreting its conventional mandate of following peaceful purposes as to not preclude dual-use activities, as long as the latter are not aggressive. These and other developments need to be accounted for in the European architecture for space and security.

Study Scope and Structure

Although Europe has started to reflect the changing situation by laying down political documents and legal agreements as a basis for new interaction, it is not yet clear how to organize the cooperation of relevant entities for maximum synergy. Various options for adapting the present landscape of space and security to the new boundary conditions are presently under consideration and discussion. This ESPI study aims at contributing to the effort of finding an optimum institutional set up for the system.

It does so by compiling and analyzing information in a complementary manner. First, it describes the relevant European actors in the field. Then, it sketches the past and present interplay of the institutions, based upon a chronology of the underlying documents, and identifies the main lines. Building upon that, it provides general observations and suggestions for the way forward. These cover basic features to comply with as well as possible directions to take.

The analysis is focussed on public institutions at a European level. Institutions in this context are understood to be entities that are directly concerned with space and security, along with their formalized activities. National institutions as such are not covered by this study. National projects, forming a complement to supra-national efforts, are discussed in the framework of the European picture as a whole.

The study constitutes a snapshot showing the present state and the way it has evolved. Although a general outlook is given, no concrete scenarios of entity interaction are provided, in particular because of the uncertain future of the Lisbon Treaty. This also has repercussions for the European institutional set up in the area of space and security, which is understood to comprise the elements of security policy where space can play a role.

The report is the first part of a wider ESPI project on space and security. The second part of the project will deal with the way

Europe does and should voice its opinion in this domain on the international stage and acts at a global level. To this end, the topic of arms control in space will be used as a case study. The two parts together will form the complete ESPI project on space and security.

European Institutions for Space and Security

The European Union (EU) is pursuing many policy areas, including security and defence. It is also becoming involved in space activities. The European Space Agency (ESA) aims at making space applications a benefit to the citizens. This includes security activities, and ESA has been re-interpreting its mandate accordingly. EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites) provides its members and their defence related institutions with weather data. Its polar satellites are of particular importance for security purposes. The Western European Union (WEU), a collective defence organization founded by European members of NATO, still serves as a discussion platform for defence and security issues. The Organisation for Security and Co-operation in Europe (OSCE) is a regional security organisation as an instrument for early warning, conflict prevention, crisis management and post-conflict rehabilitation. Entities like the Space Council or the High Level Space Policy Group are composed of members from the above institutions. Beyond that, a number of official or unofficial project groups, round tables and task forces work on specific issues or serve as forums for dialogue.

Past and Present Interaction

The legal and political development of Europe in the area of space and security, as demonstrated by various official documents, has been taking place along different lines, partially running in parallel. One has been the inclusion and implementation of a Common Foreign and Security Policy (CFSP) by the EU, along with the integration of major WEU tasks. Another line was the introduction of a European Security and Defence Policy (ESDP) as part of the CFSP, along with the definition of corresponding military needs, efforts to meet them and suggestions how to unleash the potential that space holds for security purposes. A third line consisted of creating new bodies inside existing structures (like the Political and Security Committee or the EU Military Committee) and of clarifying interaction between different bodies (as in the EU-ESA Framework Agreement). All of these endeavours were flanked by position, strategy and policy papers like the European Security Strategy and the European Space Policy. Altogether, these documents serve as a basis for the upcoming modifications and changes.

Findings and Proposals

It is imperative for Europe to continue and increase its use of space for security purposes, defining the notion of security in a broad sense and taking a multidimensional approach incorporating a well balanced mixture of civilian and military means. This approach has to be in full accordance with international law and has to be guided by the principle of “peaceful uses of outer space”, avoiding weaponization and an aggressive doctrine.

To gain and maintain weight at the global level, Europe must speak with one voice and act coherently. This applies to the domain of space and security as well. To this end, Europe must avoid being divided over issues like the US missile defence plans and must react jointly and decisively to misbehaviour or threats like the Chinese ASAT activity of 2007. Europe must also state and pursue common positions in international fora like the Conference on Disarmament.

Successful implementation will be facilitated by a European architecture for space and security that assigns unambiguous roles to the different actors respecting their mandates, competencies and abilities. The way towards a tuned institutional set up will be an evolution of existing structures rather than a revolution bringing about dramatic changes.

A key role will be played by the Member States and their bilateral or multilateral cooperation projects. Regarding the relevance of such activities in a European Architecture for space and security, three basic choices exist: A complete re-nationalization, a complete centralization or a modified approach allowing for concurrent activities at national and European level. The decision about the future role of the Member States will have to be taken by themselves, since security and defence issues are handled within the European Union's second pillar.

The system will require a solid financial basis, coordination of funding mechanisms and rules for the utilization of national and European capacities. It has to allow for full exploitation the security potential of relevant institutions, in particular EUSC or EUMETSAT. Beyond that, the framework also has to accommodate for possible extension due to joining of new Member States of European institutions. Moreover, it has to provide adequate interfaces for international cooperation, especially with NATO and within the UN.

To provide a direction and to cope with the challenges ahead, the European Space Policy (ESP) and the CFSP/ESDP have to be brought together and synchronized. On the part of the EU, this will demand a close relationship and coordination of policies, institutions and services of the Commission and the Council. Regarding the GMES initiative, the role and the significance of the security component have to be clarified and pursued.

Experiences from past and ongoing European crisis management operations and military missions like the one in Congo have to be analyzed, evaluated and reflected upon. This relates particularly to the involved space aspects. The experience gained hereby should be used as a feedback and input to the planning of future activities, resulting in modified concepts of operation. This endeavour should be flanked by scientific studies and research.

The realization of the future European Space Situational Awareness (SSA) System, belonging to the dual-use domain, will serve as a case study for the interplay of relevant institutions. The system is planned to be user driven and needs to take into due account the roles of European institutions and Member States, as well as civilian and military requirements and commercial interests. It will also test the effectiveness of the present work load share between ESA and EDA.

Furthermore, Europe needs a European Space Security Strategy (E3S) as a complementary counterpart to the European Security Strategy. Besides allowing for a coherent approach in Europe, it should also constitute a basis for cooperation in the area of space security on the international stage. It should comprise both the objective and an implementation plan. Such an E3S has already been called for in a joint memorandum by the Institute for Peace Research and Security Policy at the University of Hamburg (IFSH) and ESPI in December 2007[1].

1 http://www.espi.or.at/images/stories/dokumente/studies/memorandum%20on%20e3s.pdf

1. Introduction

The notion of space and its link to security has been gaining importance throughout the last years. Old and new kinds of threats like asymmetric warfare, terrorist attacks or large scale natural disasters together with an increased awareness of space and its potential have brought analysts, decision makers and executive entities to think about the optimum way of bringing the concepts of space and security together.

The upcoming fifth Space Council will address the issue of space and security, stressing among others the link between climate change and international security. The French Presidency of the European Union in the second half of 2008, putting emphasis on space issues, is also bound to address security and defence as one of four key priorities. The European Space Agency Council at Ministerial level in November 2008 will discuss ways to meet Europe's security and defence needs as well. This shows that the relevant issues are now being treated at the highest political level.

Various documents demonstrate that Europe as a whole is starting to allow itself the utilization of space for security purposes, reshaping its institutional set up accordingly. The Lisbon Treaty foresees space as a shared competence within the European Union. The European Space Policy formally introduces the European Union as an actor in space, and it establishes a link between space and the European Security and Defence Policy. It contains a distinct chapter on security and defence, calling for a structured dialogue of competent bodies in Europe. In parallel, ESA has been reinterpreting its mandate in a wider sense. Being confined to using space for peaceful purposes by its convention, it now considers itself entitled to engage in the dual-use domain, as long as the pursued activities are not aggressive.

All of this has led to a state of reorientation in the landscape of relevant institutions. It is not yet clear where the journey goes and what direction is most suitable. This study report aims at contributing to an optimal architectural set up by providing information about the relevant actors and their history of interaction in the area of space and security. Based on this description of past and present, general observations and suggestions for the way forward are given.

The report structure follows these lines. Chapter 2 provides general features and space specific details of important institutions in the space and security arena. Institutions in this regard are understood to consist of public entities that are or were directly concerned with space and security, along with their formalized activities. The description is limited to institutions at the European level. This constriction is not meant to neglect the significance of national institutions. Quite the contrary, the national level is and will remain of high importance within the security domain.

Chapter 3 sketches the historical development of the involved entities' interplay since 1992, when the WEU adopted the Petersberg tasks. The relevant documents are introduced and discussed with respect to their content. This is done in chronological order. In addition, a bigger picture is drawn by identifying the basic lines of development over time. Chapter 4 then builds upon this insight and looks at the future. It outlines possible directions to take and lays down boundary conditions to be considered when adapting the current structure to the challenges ahead.

Regarding the basic terms used in the discussion, one should avoid some of the most common pitfalls. While there is a perceived certainty about the notion of space, the meaning of security remains ambiguous. Most documents do not define the term, relying on its inherent and implied content. In general, it is not easy to establish a common definition as a basis of understanding.

Speaking in an abstract way, security is a state free from unacceptable risk. Risk in this context means the chance of meeting danger originating from a variety of threats. These threats can be classified along different categories, like intentional vs. unintentional, man-made vs. natural, or civilian vs. military. A rough break-down is shown in figure 1.1. The allocation can sometimes be ambiguous, though. Security as such is not restricted to humans, but can refer to technical assets and nature as well. However, security in all its manifestations is commonly understood as a condition for human well-being ultimately.

Kinds of Threats

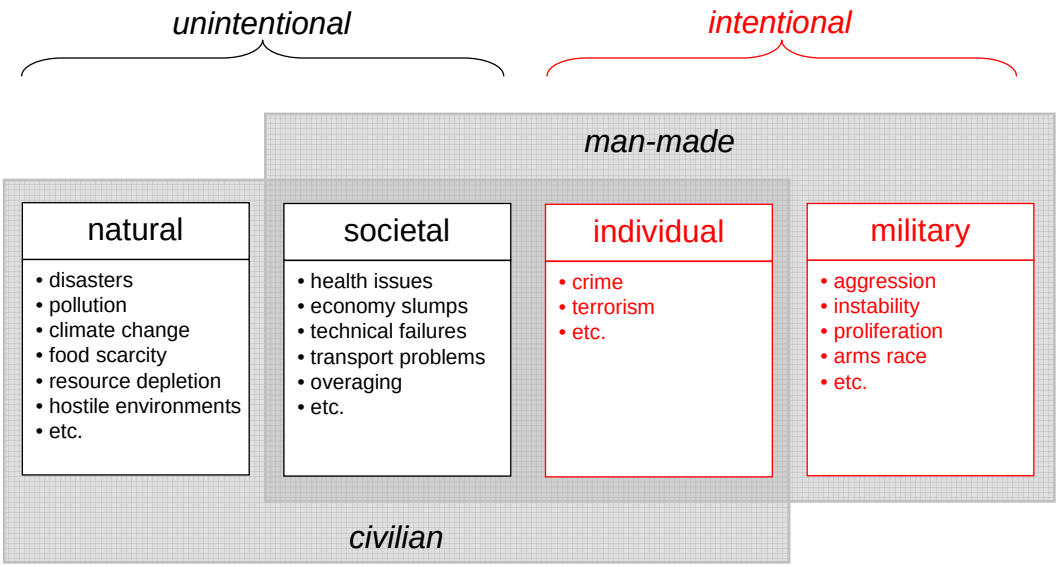

Figure 1.1: Kinds of Threats

Security policy, as a dynamic process, comprises activities and plans to bring about a state of security by protecting against the threats mentioned above. It can be carried out in a proactive or a reactive manner, using civilian and/or military means, as depicted in figure 1.2. Security policy can be interpreted in a very general way. In the widest sense of its meaning, it would even include the areas of medicine or climate change from figure 1.1. In its classical interpretation, security policy as dealt with by the military and civil protection forces is primarily concerned with intentionally induced threats, which are shown in red in figure 1.1, but it tends to be understood in a more universal way lately, especially regarding environmental issues.

One important element of security policy is given by defence, which means countering (usually in a reactive way) threats from military aggression. Although strictly speaking it is a subset of security policy, defence is usually mentioned separately due to its importance and its political touchiness, as it represents an issue area that is deliberately kept out of the supranational realm of the European Union and left to the Member States instead.

Space can contribute to the tasks of security policy in many ways – typically through applications like Earth Observation, Navigation and Communication, but also through Early Warning or Signal Intelligence. When the two terms space and security are combined to the notion of space security, an additional degree of freedom is introduced. Space security can be understood as both security in space (e.g. regarding space debris), and as security by or from space (e.g. through the use of space applications). In North America and in large parts of the European space community, space security tends to be understood as security in space. Since the latter is not the focus of this study, the designation space and security will be used in the following.

This report, dealing with the institutional set up of space and security related institutions in Europe, is the final product of the first half of an ESPI project on space and security. The second part will cover the way Europe voices its opinion in this domain on the international stage and at a global level. To this end, the topic of arms control in space will be used as a case study. The two parts together will form the complete ESPI project on space and security.

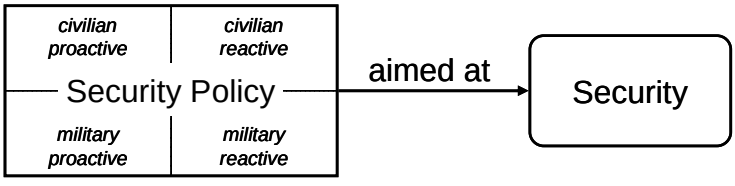

Figure 1.2: Security Policy

2. European Institutions for Space and Security

In this chapter, public European institutions involved in space and security will be shortly described. The focus will be on official structures represented by EU, ESA, EUMETSAT and WEU. The EU will be considered in more detail due to its complexity. The description of other institutions includes OSCE, the Space Council, HSPG and EISC. The compilation is complemented by sketching national projects cooperation schemes at bi- and multilateral level to illustrate the potential they hold for an integrative European approach.

2.1. European Union (EU)

2.1.1. General Information

The European Union (EU) has 27 Member States with an overall population of almost 500 million people. Being a global economic power, it aims at asserting its identity at the international level through the implementation of a Common Foreign and Security Policy (CFSP). In interior matters the EU shall be maintained and developed as an area of freedom, security and justice. Pursuant to its objectives, the EU undertakes a lot of activities in various policy areas, including security, defence and space. Because of its political significance and to illustrate the relevant actors of space and security within the wide range of different policies, the EU will be described in more detail below.

The European Union was set up by the Treaty of Maastricht in 1992 which integrated different European policy areas into a common structure and created the current pillar structure. The Treaty of Lisbon foresees the abolishment of the pillar structure, but its entry into force is uncertain. The first pillar, which is also called the European Communities or the community pillar, comprises the European Community (EC, formerly European Economic Community), the European Atomic Energy Community (EAEC or Euratom), and the European Coal and Steel Community (ECSC). The second pillar is constituted by the Common Foreign and Security Policy (CFSP) and the third pillar is the Police and Judicial Cooperation in Criminal Matters (PJC)[2].

The pillars within the EU do not only differ in terms of the respective policy area they deal with but also with regard to the governance, legislative procedures and decision making. Basically, one can distinguish between the first pillar on the one hand and the second and third pillar on the other hand. In any case, governance is strictly based on the principle of subsidiarity, which means that regulatory acts can only be passed within the scope of conferred powers.

Governance in the first pillar is based on the supranational principle which means that in the respective policy area member states have transferred legislative competence to the EU level. In practical terms, this means that

- institutions as the European Commission (responsible for proposing legislation, implementing decisions, and upholding the Union's treaties), the European Parliament and the Court of Justice have a greater influence in the legislative procedure than in the second and third pillar (depending on the scope of their involvement in the decision making process, there are different legislative procedures: codecision procedure, assent procedure, consultation procedure, and cooperation procedure);
- even crucial decisions are taken by qualified majority vote meaning that member states can be overruled and cannot veto a decision which they oppose; and
- there are different types of legislative acts compared to the second and third pillar, one being a Regulation, which is directly applicable in the Member States without the requirement to transpose it into national law.

2 http://europa.eu/abc/panorama/howorganised/index_en.htm

Name	European Union
Basis	Supranational organisation based on intergovernmental treaties (Maastricht, Nice, Amsterdam)
Year of foundation	1992
Main organs	Council of the EU, European Council, European Commission, European Parliament
Decision making	There are different types of decision making. The criteria for distinguishing between them are: • the voting procedure (unanimous vote, qualified majority vote), and • the involvement of the European Parliament and the European Commission (codecision procedure, assent procedure, consultation procedure, and cooperation procedure)
Seat/headquarters	Brussels, Luxembourg, Strasbourg
Main purpose	Promotion of economic and social progress; asserting the EU's identity on the international scene, developing an area of freedom, justice and security
Number of member states	27
Member States	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom
Constituency remarks	EU MS not part of ESA: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia ESA MS not part of the EU: Switzerland, Norway
Budget (global and space-related)	Global budget 2008: EUR 129,15 billion • Space-related funding within FP7 from 2007-2013: EUR 1,43 billion • Galileo for the period from 2007-2013: EUR 3.4 billion (the costs of the overall programme for the next 25 year are estimated around EUR 14 billion) • Median annual space-related expenditure: EUR 690 million (period from 2007-2013)

Table 1: Information on the European Union (EU)

The supranational character of the EU constitutes a unique trait which makes it an organisation that is fundamentally different from other international organisations and entities.

By contrast, cooperation in the scope of the second and third pillar is based on the intergovernmental principle. This means that

- the aforementioned supranational institutions have less influence on the policies; and that
- critical decisions are basically taken unanimously by the Council of the EU (the assembly of national ministers whose composition depends on the policy area dealt with - with regard to the governance aspect of the EU's space-related activities the Competitiveness Council of the EU plays an important role) and the European Council (the assembly of EU heads of states plus the president of the Commission).

The history of the EU has always been dominated by the dynamics of the integration process and the enlargements of the union. Integration means that over the years competencies for more and more policy areas have been conferred from the national to the EU level. A higher level of integration has also been achieved by introducing qualified majority voting and new legislative procedures into the decision making process of the EU. The subsequent development of a European Security and Defence Policy (ESDP) as a new policy area of the EU constitutes a further extension of the Union's competencies. Initially just mentioned as a potential new policy area in the Treaty of Maastricht, the ESDP has been significantly developed since its launch in 1999 and would receive a more concrete design with the Lisbon Treaty.

2.1.2. Space and Security-related Activities and Structures

Based on its cooperation with ESA, the EU is involved in two European flagship projects in space, namely the Galileo [3] satellite navigation system and GMES [4] (Global Monitoring for Environment and Security). Especially GMES has potential for security related applications. At the 2001 EU Summit in Gothenburg, GMES was confirmed as a European Union's priority area and the Community was called to contribute to a European capacity for Global Monitoring for Environment and Security. In the following years, GMES developed into an initiative set up jointly by the European Commission and ESA.

It is driven by the need to improve the monitoring of the European and global environment in view of pursuing the sustainable management of our resources and the security of the citizen. As GMES was expanded to include the security aspects of global Earth monitoring, many in Europe realised that monitoring the status and the activities of the Earth's land masses, oceans and atmosphere do include a security dimension. This is especially true for the emergency response fast track service, one of the three foreseen fast track services. An operational GMES will also provide a basis for the European contribution to the new initiative for improved coordination of strategies and systems for Earth observations, GEOSS (Global Earth Observation System of Systems)[5].

Various EU bodies dealing with space issues have been created. In the context of security-related policies, the identification of actors within the EU depends on the understanding of the term security, as already indicated in the introduction. The following overview identifies the main EU actors in the area of space and security, along the current pillar structure.

European Community / 1st pillar

DG (Directorate-General) Enterprise and Industry is responsible for general space policy considerations and GMES. It supports the work of the Commissioner for Enterprise and Industry, Günter Verheugen. Directorate H of this DG is in charge of aerospace, GMES, security and defence. It comprises Unit H/2 "Space policy and coordination", which is mainly responsible for coordinating the European Space Policy. Unit H/5 "GMES Bureau" in the same Directorate, aims at implementing the fast-track services of GMES as well as working on the GMES governance structure and longer-term financial sustainability.

DG Transport and Energy is in charge of the Galileo project. Working for the Commissioner for Transport, Jacques Barrot, the Directorate G "Maritime transport, Galileo & Intelligent transport" comprises two entities responsible for Galileo: Unit G.3 "Galileo; Policy and Infrastructure" and Unit G.4 "Galileo applications; Intelligent transport systems".

Apart from the structures within the Commission, there is also a European agency that is in charge of managing the Galileo programme. In general, such agencies can be set up within each of the different pillars for various purposes. The European GNSS Supervisory Agency (GSA) constitutes the regulatory authority for the European GNSS (Global Navigation Satellite System) programmes, which are EGNOS (European Geostationary Navigation Overlay System) and Galileo. To this end, the GSA manages the European satellite navigation programmes, controls the use of funds, and manages the related R&D activities. Furthermore, the agency is responsible for the registration of the frequencies necessary for the operation of the systems, the certification of the components, and their safety and security. It is also the licensing authority vis-à-vis the concession holders responsible for the operation and service provision of Galileo and ensures contract compliance. The GSA owns the assets created under the EGNOS and Galileo programmes. The authority constitutes a community agency which was set up by a Council Regulation on 12 July 2004 and which is based in Brussels. Within the European Commission, the above mentioned Unit G.3 "Galileo; Policy and Infrastructure" of DG Transport and Energy is in charge of the relations of the Commission to the GSA.

Besides the benefits of distinct space applications, the space sector itself is regarded as being a driving force for growth and employment in a knowledge-based economy. The development of innovative space technologies and applications generates knowledge that is of use to the European societies at large. This is the main reason for the EU investing in space research and development within the scope of the Seventh Framework Programme for Research, Technological Development and

3 http://ec.europa.eu/dgs/energy_transport/Galileo/index_en.htm
4 http://www.gmes.info/
5 http://earthobservations.org/

Demonstration Activities (FP7) [6] . This programme bundles all research-related EU initiatives under a common roof playing a crucial role in reaching the goals of growth, competitiveness and employment. It consists of the four categories Cooperation, Ideas, People and Capacities. In terms of space research, which belongs to the category of cooperation, the following activities are funded: space-based applications serving European societies, the exploration of space, and the strengthening of space foundations. In total, the FP7 earmarks EUR 1.43 billion for the funding of space-related research for the period from 2007-2013.

In the scope of the FP7 Cooperation Programme there are also considerable funds foreseen for security research. A Preparatory Action on Security Research (PASR) had already been launched by the European Commission in 2004 in order to contribute to combining the strengths of the security industry and the research community to effectively respond to security challenges. For the period 2004-2006 EUR 65 million have been allocated among various research projects in the fields of situational awareness, security and protection of network systems, protection against terrorism, crisis management, interoperability and integrated systems for information and communication. One of the included projects was ASTRO+ (Advanced Space Technologies to Support Security Operations). From the outset, PASR was aimed at evolving into a comprehensive security research programme. This has been achieved with the FP7, which allocates a budget of EUR 1.4 billion for security-related research for the period from 2007 to 2013 and contains a dedicated call on "GMES and security". It should be mentioned that already the predecessor FP6 had comprised security related projects like GMOSS (Global Monitoring for Stability and Security), LIMES (Land and Sea Integrated Monitoring for Environment and Security) or TANGO (Telecommunications Advanced Networks for GMES operations), all of them as part of GMES.

Regarding the governance of space and security-related research, DG Enterprise and Industry disposes of two units within Directorate H to manage the respective research area, namely H/3 "Space Research and Development" and H/4 "Security Research and Development". Apart from that, the Research Executive Agency (REA) also plays a significant role in terms of space and security research. This agency was set up in December 2007. Being located in Brussels, it has the aim of managing a large part of the FP7. Its main tasks are the evaluation of proposals for research projects and the management of these projects within the context of FP7. This also refers to space and security-related projects, since these areas constitute important parts of the FP7 programme. Even though FP7 ends in 2013, the REA is expected to remain in place until 2017 in order to manage projects funded during FP7. Depending on a possible subsequent European research programme, the life of REA might be extended.

The Joint Research Centre of the EU (JRC) as an independent Directorate-General represents another actor in the realm of space and security. The JRC is a research-based policy support organisation acting under Janez Potocnik, European Commissioner for Research, with the aim of increasing security in Europe. Within the scope of its broad activities the JRC operates i.a. the Institute for the Protection and the Security of the Citizen (IPSC). Located in Ispra, Italy, it contributes to the protection from accidents, deliberate attacks, fraud and illegal action against EU policies.

One example for an action carried out in the scope of the JRC's security related activities is the Information Support for Effective and Rapid External Action (ISFERA). It focuses on the use of high resolution satellite data for security purposes. The analysis is not only provided to other Directorates-General such as the External Relations Directorate-General (DG RELEX), but also to the European Council, other bodies of the European Union apart from the European Commission, to member states of the EU, to United Nations agencies, and even to non-governmental organizations.

When broadening the meaning of security, one can still find other bodies within the scope of the first pillar dealing with the security domain, for example the European Agency for the Management of Operational Cooperation at the External Borders (FRONTEX). However, for the purpose of this study security is regarded in a rather narrow sense, as already mentioned above.

Common Foreign and Security Policy / 2nd pillar

Policies in the scope of the second pillar are obviously concerned with security matters. For an efficient conduct of the CFSP, specific structures were created. The Political and Security Committee (PSC), which is

6 http://cordis.europa.eu/fp7/home_en.html

mentioned in the Treaty of the EU (art. 25), has the task to monitor the international situation and contribute to the definition of policies by delivering opinions to the Council. The PSC also coordinates the work of the different parties in the area of the CFSP.

Other organs acting in support of the PSC and established by Council Regulations are the European Union Military Committee (EUMC) and the European Union Military Staff (EUMS). The former constitutes the highest military body within the EU, consisting of the Chiefs of Defence, represented by their military representatives. It constitutes a forum for military consultation and provides advice and recommendations to the PSC. The EUMS, which acts under the authority of the EUMC, consists of military experts. It provides early warning, strategic planning and situation assessment to the EUMC and the High Representative for the CFSP, who is also Secretary-General of the Council of the EU (HR/SG). During ongoing operations, the EUMS is in charge of monitoring all military aspects of the respective mission and providing new options for operational development based on strategic military advice. Within the EUMS, there is a civil/military cell, carrying out strategic planning for joint civil/military operations in support of the EUMS. Finally, a Committee for Civilian Aspects of Crisis Management (CIVCOM) was set up in order to provide advice and recommendations on civilian aspects of crisis management to the PSC.

Besides these CFSP bodies there are also agencies dealing with security and space matters in the realm of the second pillar. An institution which combines both policy areas is the European Satellite Centre [7] (EUSC), which was transformed into a EU agency by a Council Joint Action on 20 July 2001. The agency is located in Torrejón, Spain, and formerly constituted a facility of the Western European Union (WEU). It was initially founded in 1991. Today, with a staff of around 100 people, its task is to exploit and produce information derived from the analysis of Earth observation imagery in order to support EU's decision-making in the field of the CFSP, particularly of the ESDP, including crisis management operations. It is also associated with conflict prevention, observation and humanitarian aid. The EUSC works under the operational direction of the HR/SG. The PSC, which is subordinated to the Council of the EU, is responsible for the political guidance of the centre. The EUSC is the EU's first operational entity in space activities.

The imagery analysis of the EUSC is provided to various entities in the EU. First and foremost, the agency supports the work of the European Union Military Staff. Imagery analysis is also provided to other Community institutions. The JRC and in particular the above mentioned IPSC, whose activities rely on satellite imagery data, as well as the DG RELEX receive data from the EUSC. On request, the centre can also provide services to individual member states and third parties including international organisations. In terms of data acquisition the EUSC relies to a great extent on commercially available satellite imagery data but also on non-commercial data provided by European Earth observation satellites. The annual budget of the centre amounts to approximately EUR 10 million.

In the field of the ESDP, the European Defence Agency (EDA) [8] was established under a Joint Action by the Council of Ministers on 12 July 2004. The agency is based in Brussels and has the general purpose to improve the EU's defence capabilities, especially in the field of crisis management. To this end, it aims at promoting EU armament cooperation, strengthening the EU's defence industrial and technological base and creating a competitive European defence equipment market. In this field, EDA has taken over much of the work of the former Western European Armaments Group (WEAG) and the Western European Armaments Organisation (WEAO) of the Western European Union (WEU). Moreover, the agency also promotes research, with a view to strengthening Europe's industrial and technological potential in the defence field.

A project which combines security and defence-related aspects is the demonstrator for a Tactical Imagery Exploitation System (TIES) which was set up by EDA in cooperation with the EUSC. The demonstrator is installed at the EUSC in Torrejón in order to compensate for the lack of interoperability between European satellite imagery systems and ground systems. This is achieved by creating a capacity for receiving imagery data in different formats provided by different satellite systems and fusing it into one usable and workable intelligence product. The lack of interoperability has long been regarded as a major obstacle for enhancing European defence capabilities in the area of satellite applications. During its operational time, the participating Member States have the chance

7 http://www.eusc.europa.eu/

8 http://www.eda.europa.eu/

to evaluate the project. The EDA Steering Board decided upon the project in May 2006 and its operation will end in September 2008.

Apart from the EUSC and EDA, there is another agency contributing to the CFSP. The European Union Institute for Security Studies (ISS)[9] situated in Paris was set up by a Joint Action of the Council on 20 July 2001. It aims at helping to establish a common European security culture and fostering a strategic dialogue between official European decision-makers and non-official specialists. The ISS accomplishes its aim by conducting academic research and analysis in fields relevant for the CFSP and the ESDP and drafting recommendations upon this research. Moreover, it arranges seminars and develops the transatlantic dialogue on security issues between European states, the USA and Canada.

Police and Judicial Cooperation in Criminal Matters/3rd pillar

The policies of the third pillar aim at establishing the EU as an area of freedom, security and justice. It possesses some institutions whose work could be supported by space. For example, in terms of police cooperation the European Police Office (EUROPOL) based in The Hague aims at helping Member States to cooperate more closely and effectively in preventing and combating various forms of organised international crime. The main objective of the European Union's Judicial Cooperation Unit (EUROJUST) is to enhance the development of Europe-wide cooperation in criminal justice cases. Besides that, the European Police College (CEPOL) organizes courses and seminars to encourage cross-border cooperation in the fight against crime, as well as in maintenance of public security, and law and order.

Name	**European Union Satellite Centre (EUSC)**
Basis	Agency of the EU created by Council Joint Action 2001/555/CFSP and Council Joint Action 2006/998/CFSP (amendment)
Year of foundation	1991 (as WEU institution), 2001 (as EU agency)
Main organs	• Director (Frank Rainer Asbeck): i.a. responsible for preparing the work of the Board (in particular the draft Annual Work Programme), day-to-day administration of the EUSC, all personnel matters, informing PSC on Annual Work Programme, ensuring cooperation with Community space-related services • Board of the EUSC (chaired by HR/SG, consisting of representatives of the MS, and one of the Commission): appoints the Director, adopts Annual Work Programme, budget; meets at least twice a year • Divisions: Operations Division, Operations Support Division, Technical Division, Administration and Personnel Division
Decision making	Board decides by qualified majority
Seat/headquarters	Torrejón, Spain
Main purpose	support the decision-making in the CFSP (in particular ESDP) by providing material resulting from the analysis of satellite imagery
Number of Member States	27 (Denmark only partly involved in EUSC activities due to its opt-out of issues relating to defence)
Member States	EU MS (regarding Denmark, see line above)
Budget	about EUR 11 million (in 2007)

Table 2: Information on European Union Satellite Centre

9 http://www.iss.europa.eu/

European Parliament

Beyond the pillar structure, the European Parliament, the only directly elected body of the European Union, is also of importance in space matters. Although it does not have a direct say in security matters, the Council consults the Parliament on main aspects of CFSP matters, and the Parliament may put questions and make recommendations to the Council. Being part of the legislative branch, the Parliament also exerts a certain financial power since Parliament and Council together constitute the budgetary authority of the European Union[10].

There are twenty Parliamentary Committees. The Committee on Transport and Tourism is in charge of Galileo. Within the Committee on Foreign Affairs, the Subcommittee on Security and Defence (SEDE) is of particular relevance for space and security. It has been showing interest in space matters by, amongst other things, commissioning the recent study on "The Cost of Non-Europe in the Field of Satellite Based Systems"[11] and by conducting a workshop on "Space Policy and ESDP". The subcommittee's chairman, Mr. Karl von Wogau, has also initiated a European Security Round Table (ESRT), whose past discussions included the topic "Space - A Dimension to European Security"[12].

Name	**European Defence Agency (EDA)**
Basis	Agency of the EU, created by Council Joint Action 2004/551/CFSP
Year of foundation	2004
Main organs	• Head of the Agency (HR/SG Javier Solana): responsible for agency's overall organisation and functioning, for ensuring that guidelines issued by the Council and decisions of the Steering Board are implemented by the Chief Executive • Chief Executive (Alexander Weis): i.a. responsible for day-to-day administration, the implementation of the agency's Annual Work Programme, preparing the work of the Steering Board (in particular for the draft Annual Work Programme), ensuring cooperation with Council bodies (PSC, EUMC), draft annual budget, all staff matters • Steering Board (chaired by HR/SG, consists of defence ministers of participating MS, one member from COM): appoints Chief Executive, approves Annual Work Programme, budget, reports/recommendations submitted to the Council; shall meet at least twice a year • Directorates: Capabilities Directorate, Research & Technology Directorate, Armaments Directorate, Industry & Market Directorate
Decision making	Steering Board decides with qualified majority (only participating MS)
Seat/headquarters	Brussels, Belgium
Main purpose	support Council and EU MS in their effort to improve the EU's defence capabilities
Number of Member States	26
Member States	those EU MS which have notified to the Council their participation in the agency ("participating MS"), today: all EU MS except for Denmark
Budget	about EUR 20 million (2007)

Table 3: Information on European Defence Agency

10 http://www.europarl.europa.eu

11 http://www.europarl.europa.eu/activities/expert/eStudies.do?languageEN

12 http://security-round-table.eu/esrt2007.php

2.2. European Space Agency (ESA)

2.2.1. General Information

ESA is the Space Agency of Europe. ESA is an international organisation with currently 17 member countries, four European states with cooperation agreements and one associated non-European country, Canada, which takes part in several programmes. ESA coordinates the financial and intellectual resources of its members and can initiate and manage programmes and activities that are beyond the scope of single European countries. It is ESA's mission to form Europe's space capability and to make space applications and science a benefit to the citizens of Europe and the world[13]. One of these benefits is constituted by security.

Article 2 of the ESA convention states that the "the purpose of the Agency shall be to provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications..."[14]. The transfer of ESA products and technology to non ESA countries also has to bear in mind the peaceful purposes of ESA.

However, its Council in 2004 approved a position paper "ESA and the defence sector" stating that these peaceful purposes do not exclude dual-use activities as long as they are not aggressive. This can be seen as a re-interpretation of ESA's mandate that is now generally accepted. In 2006, ESA's Director General released the so called Agenda 2011[15] calling for the exploitation of synergies between the needs of civilian and defence space services. The same year, ESA's Space and Human Security Working Group issued a report[16] attributing specific importance to the security relevance of GMES and Galileo. These documents have contributed to an enhanced ESA profile in space activities of dual-use.

As to ESA's funding, every Member State contributes to mandatory programmes on a scale based on its respective Gross Domestic Product (GDP). The optional programmes are only of interest to some Member States, who are free to decide on their level of involvement. About 90% of ESA's budget is spent on contracts with European industry. In order to create a kind of balance between what a Member State contributes and what industrial contracts it may entail, ESA's industrial policy has realized the principle of a "geographic return". A Member State's return coefficient is the ratio between its percentage share of all contracts awarded to all member states and its percentage of total financial contribution. The overall return coefficient of a country should ideally be 1.

In the process of ESA - EU approximation, the geographical return factor of ESA is widely being discussed. Any programme being led and funded by EU is based on purely competitive awarding of a contract. The EU principles build on competition, not on a strictly "input-output" balance. There is no generally accepted and ideal solution to this problem yet. The "one country, one vote" principle of ESA is also under discussion, due to ESA's increasing number of Member States. Especially the countries contributing a large amount of funds fear their interests are not being considered adequately. The funding mechanism will be of particular relevance if ESA should find its way into armament projects. The technical development capacity of ESA is very attractive to Member States, which still run the major part of defence-related space activities on their own, as will be discussed later.

2.2.2 Space and Security-related Activities and Structures

There are a number of ongoing ESA activities that have a security dimension, although they were not specifically designed to account for security requirements[17]. Examples include the ENVISAT and ERS-2 missions, whose data are supplied to the EUSC. ESA also supports the International Charter on Space and Major Disasters and it has initiated activities with the International Atomic Energy Agency (IAEA) for monitoring critical infrastructures.

Regarding GMES and Galileo, ESA had already been engaged in these programmes as a result of its cooperation with the European Union, which is one of the main users of space applications. In the domain of GMES, for example, ESA had launched the RESPOND and the MARISS projects[18]. In the future, ESA will contribute heavily to GMES,

13 http://www.esa.int/SPECIALS/About_ESA/SEMSN26LARE_0.html
14 Convention of establishment of a European Space Agency. SP-1271(E), 2003
15 Agenda 2011. Document by the ESA Director General and the ESA Directors, 16 October 2006, Paris
16 ESA/C(2007)135. Basic Information Concerning Space and Security
17 ESA/C(2007)111 Status of Security-Related Activities in ESA
18 Space Policy, Issues and Trends in 2006/2007. ESPI Report 6, September 2007, Vienna

for example via existing satellites and the planned Sentinel missions.

In the planning of new activities, ESA now takes into account the new boundary conditions described above19. In particular, it attempts to enhance the synergy between space and security by including security requirements into the set up of new programmes and activities. Such requirements could consist of strengthening European independence regarding components, products and technology from abroad, better information and higher awareness of operational conditions in the space environment. The candidate initiatives for inclusion of these requirements are NewPro, the Enhanced European Data Relay Satellite EDRS, and the planned Space Situational Awareness (SSA) system.

SSA refers to knowing the location and function of relevant space objects and to realizing different kinds of space related threats like space debris. It also allows to control compliance with international treaties

Name	**European Space Agency**
Basis	International, organisation, based on an intergovernmental agreement. ESA Convention of 1975
Year of foundation	1975 (with 10 countries)
Main Organs	• Director General and Executive • ESA Council (at delegate or ministerial level) o ESA programme boards
Decision making	• Each Member State has one vote • ESA Council: Generally simple majority • Level of Resources demands unanimous decision • Several others like programme budget demand two-thirds majority with weighted vote
Seat/Headquarters	• Headquarters in Paris, F • ESA centres in European countries with different responsibilities: o EAC, the European Astronauts Centre in Cologne, D; o ESAC, the European Space Astronomy Centre, in Villafranca del Castillo, Madrid, E; o ESOC, the European Space Operations Centre in Darmstadt, D; o ESRIN, the European Space Research Institute, in Frascati, near Rome, I; o ESTEC, the European Space Research and Technology Centre, Noordwijk, NL
Main purpose	• ESA has the mandate to coordinate the financial and intellectual resources of its members in the area of space activities. • ESA proposes and undertakes programmes and activities that are financially far beyond the scope of any single European country.
Number of member states	• 17 Member States • plus four European cooperating states: Czech Republic, Hungary, Poland, Romania • plus Canada as an associated country
Member States	• Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.
Constituency remarks	• Canada is affiliated with ESA through an association agreement and takes part in several projects/programmes. • Hungary, Poland, Romania and the Czech Republic are European Cooperating States. • Switzerland and Norway are members of ESA but not of EU
Budget	EUR 2,975 million (2007)

Table 4: Information on the European Space Agency

19 Ibid.

and mitigation measures. Currently, Europe does not have an autonomous capability for SSA. Some sensors for Space Surveillance exist at national level, but they just provide part of the necessary information. For the time being, a bigger SSA system can only be sketched with data that is provided from abroad, mainly from the United States[20].

Efforts to set up a European SSA system are underway. A final decision is due for the upcoming ESA Council Meeting at Ministerial level. The system, drawing also on national resources, will have to account for civil, military and commercial interests. In the framework of a preparatory action, ESA has set up a group of potential SSA users to define and discuss the respective needs and requirements. Meanwhile, the EDA has also become involved in specifying the military requirements for an SSA system. The interaction of ESA and EDA will serve as a test case for common realization of dual-use projects.

2.3. EUMETSAT

2.3.1 General Information

EUMETSAT was founded in 1986 and is the European Organisation for the Exploitation of Meteorological Satellites, which provides its members and cooperating states with Earth observation data and services[21]. It is an intergovernmental organisation with 21 Member States. These countries provide funds and are the main users. EUMETSAT has cooperating agreements with an additional 9 countries in Europe.

EUMETSAT's main purpose is the establishment, maintenance and exploitation of European systems of operational satellites and the contribution to the operational monitoring of the climate and the detection of global climatic changes. EUMETSAT's strategic objective is to respond to the evolving needs of the National Meteorological Services (NMS) of its Member and Co-operating States. Currently, EUMETSAT operates a fleet of two generations of geostationary weather satellites and several polar orbiting satellites.

Financial contributions to EUMETSAT are based on a proportion of the gross national income of the individual Member State. In EUMETSAT programmes, the first flight model of a satellite is being realized through an ESA programme with a 30% contribution form EUMETSAT, which finances every reproduction of an operating satellite by 100%. The industrial contracts within a consortium of satellite manufactures are independent of the contribution of the Member States but follow the ESA rules of geographical return.

2.3.2. Space and Security-related Activities and Structures

Operational meteorological and climate monitoring services are EUMETSAT's priorities. The development of new environmental services will cover the oceans, atmosphere, land and biosphere. New satellite services are foreseen particularly in the context of the GMES initiative, to which EUMETSAT satellites are foreseen to contribute.

A major part of EUMETSAT data goes to defence-related institutions. These can have direct access to data distributed by EUMETSAT in various ways[22], or they can be served via the National Meteorological Service. In Germany, for example, provision of the armed forces is part of the legal mandate of the DWD (Deutscher Wetterdienst), the German Weather Service. Meteorological data from polar satellites are of particular strategic importance.

The EUMETSAT Convention also contains an article on security issues, stating that the issues laid down in the Protocol are not meant to prejudice the right of each Member State to take all precautionary measures necessary in the interests of its security. In many states, weather data are seen as critical to public security and technical safety.

20 Europe's Way to Space Situational Awareness (SSA). ESPI Report 10, January 2008, Vienna

21 http://www.eumetsat.int/Home/Main/Who_We_Are/Overview/index.htm?l=en

22 http://www.eumetsat.int/Home/Main/Access_to_Data/Delivery_Mechanisms/index.htm?l=en

Name	**European Organisation for the Exploitation of Meteorological Satellites**
Basis	International inter-governmental organisation, based on EUMETSAT Convention
Year of foundation	1986
Main Organs	• Council of EUMETSAT • Director General, heading the Secretariat o 7 subsidiary bodies of the Council
Decision making	• Each Member State has one vote • Major decisions demand unanimous decisions or a two-thirds majority
Seat/Headquarters	Headquarter in Darmstadt, D
Main purpose	• EUMETSAT is the European operational satellite agency for monitoring weather, climate and the environment. • The primary objective of EUMETSAT is to establish, maintain and exploit European operational meteorological satellites, with possible account of the recommendations of the World Meteorological Organisation. • EUMETSAT objective is also to contribute to the operational monitoring of the climate and the detection of global climatic changes.
Number of Member States	21 plus 9 cooperating states
Member States	Austria, Belgium, Croatia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
Constituency remarks	Members not part of EU: Norway, Switzerland, Turkey
Budget (global and space related)	EUR 152,5 million (2008)

Table 5: Information on EUMETSAT

2.4. Western European Union (WEU)

2.4.1 General Information

The Western European Union (WEU) is a collective defence organisation that was founded 1954 by seven member countries[23]. Its major residual tasks and functions, relating to several Articles in the modified Brussels Treaty, are the mutual defence pact, the annual reporting obligation and the preparation of the future opening of the archives to the public. Earlier WEU operational functions have been integrated into the EU, and its tasks like crisis management have been merged into the EU's CFSP. EUSC and EUISS have replaced the WEU Satellite Centre and the WEU Institute for Security Studies. This will be discussed in chapter 3.

The current remaining structure of the WEU enables the Member States to fulfil the commitments of the tasks mentioned above. By the Treaty of Amsterdam, the General Secretary of the WEU is the High Representative for the CFSP and Secretary-General of the Council of the EU. The Council of WEU is composed of Ministers from the Member States. The Secretariat General and the Assembly are funded by the ten Member States according to a key approved by the Council.

2.4.2 Space and Security-related Activities and Structures

For the member and partner countries, the WEU is an established platform for dialogue and cooperation on security and defence matters, also relating to space. It also serves as an important initiator of political debate, as demonstrated by its Recommendation 755 on the space dimension of the European Security and Defence Policy[24].

Name	Western European Union (WEU)
Nature of the actor	International organisation initialized 1948 by Treaty of Brussels and established 1954 by Paris Agreements
Year of foundation	• 1948/1954
Main Organs	• Secretary General • Council • Assembly of WEU
Decision making	• At intergovernmental level, Council decisions are taken by consent. • At interparliamentary level, the Assembly decides with majority vote.
Seat/Headquarters	Brussels, Belgium
Main purpose	According to modified Brussels Treaty and to the transfer of functions to the EU, the following functions remain: • the mutual defence pact, • the annual reporting obligation, • restructuring of the archive and preparation for a public opening of the archives, • platform for Member States to discuss defence and security issues.
Number of Member States	• 10 Member States • 6 Associate Members • 5 Observers • 7 Associate Partners
Member States	Belgium, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom.
Budget	Secretariat General and Assembly have funds of around EUR 14 million (2008).

Table 6: Information on the Western European Union

23 http://www.weu.int/

24 http://www.assembly-weu.org/en/documents/sessions_ordinaires/rpt/2004/1881.html#P181_25206

The Assembly[25] represents the parliamentary dimension of the WEU. European national parliaments send delegations to the Assembly, which currently has some 400 members. Its tasks have changed since the WEU´s operational activities' transfer to the EU. Since then, the Assembly acts as the Interparliamentary European Security and Defence Assembly, focusing on the European Security and Defence Policy and the further development of the EU´s civil and military crisis management capabilities.

The Assembly also continues to discuss intergovernmental cooperation in the field of armament as well as armament research and development. The Assembly appoints six permanent committees. Committee meetings are held on a regular basis together with colloquies, conferences and seminars on specific topics. Committees prepare reports and recommendations. One of the committees is the Technological and Aerospace Committee that deals with defence and dual-use issues.

2.5. Other Institutions

2.5.1 OSCE

The Organization for Security and Co-operation in Europe (OSCE) [26] with its 56 participating States from Europe, Central Asia and North America and 11 Partner Countries forms the largest regional security organization in the world. It is a master instrument for early warning, conflict prevention, crisis management and post-conflict rehabilitation in its area. Its activities

Name	Organisation for Security and Co-operation in Europe
Basis	International organisation
Year of foundation	First Conference in 1973
Main Organs	• Summit • Permanent Council • Forum for Security Cooperation and Economic and Environmental Forum. • Secretary General • The Parliamentary Assembly
Decision making	Generally by consent
Seat/Headquarters	Vienna, Austria
Main purpose	An instrument for early warning, conflict prevention, crisis management and post-conflict rehabilitation in the area of security.
Number of Member States	56
Member States	• Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Holy See, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Former Yugoslav Republic of Macedonia, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, United Kingdom, United States, Uzbekistan • Partners for Cooperation, Afghanistan, Algeria, Egypt, Israel, Japan, Jordan, Mongolia, Morocco, South Korea, Thailand
Constituency remarks	• Including North American and Asian states • Non EU countries like Norway, Switzerland
Budget	• EUR 164 million (2008)

Table 7: Information on Organisation for Security and Co-Operation in Europe

25 http://www.assembly-weu.org/en/index.php

26 http://www.osce.org/

are related to three dimensions of security — the human, the political-military and the economic-environmental one. The OSCE should serve as the first international point of contact in case of conflicts within its sphere of activities. Though it is not directly involved in space activities, it has the potential to serve as a discussion and communication platform for security matters referring to space.

Regarding the political-military security dimension, the OSCE takes a comprehensive approach to the politico-military dimension of security, which includes a number of commitments by participating States and mechanisms for conflict prevention and resolution. The Organization also seeks to enhance military security through the promotion of greater openness, transparency and cooperation. Fields of action encompass arms control, border management, combating terrorism, conflict prevention, military reform and policing[27].

The Parliamentary Assembly of the OSCE is the parliamentary dimension of the Organization for Security and Cooperation in Europe. The primary task of the 320 members, appointed by their national Parliaments, is to promote important aspects to meet the challenges of democracy throughout the OSCE area, and to facilitate inter-parliamentary dialogue and cooperation. Decisions at the annual session are taken by majority vote.

2.5.2 Space Council

The Space Council is based on article 8 of the EU-ESA Framework Agreement of 2003[28]. It became the common conference of the high level boards of EU and ESA for space related issues. It consists of representatives from the concerned ministries of the 27 EU Member States and the 17 ESA Member States. The Chairs are the respective representative of the ESA Council of Ministers and the representative of the EU Competitiveness Council plus Industrial Commissioner and Vice President of the European Commission, Guenther Verheugen, and Jean-Jacques Dordain, the ESA Director General.

The Space Council was set up for coordinating and facilitating the space activities of both organisations, especially since the EU has become an actor in European space activities. Lacking a concrete mandate, its resolutions have to be approved by the two composing Councils, the ESA Council and the EU Ministerial Competitive Council. Decisions in the Space Council are taken by consent. Major achievement on the past Space Councils are listed in the following:

- 2004: The first Space Council defined space as a shared competence of the EU and ESA. The Space Council acknowledged the importance of space activities for a wide range of European policies
- 2005: The second Space Council reaffirmed the need for Europe to have a space programme. A new European Space Programme will provide an opportunity for ESA and the European space industry to respond to new European political challenges, and to reap benefits from the new environment.
- 2006: The third Space Council endorsed the orientations necessary to pave the way for GMES. The importance of maintaining an autonomous European Earth Observation capacity supporting political decision making was stressed.
- 2007: The fourth Space Council adopted the resolution on the European Space Policy[29], giving Europe its first agreed upon space policy.

2.5.3 High-Level Space Policy Group

The High-Level Space Policy Group (HSPG) is also based on article 8 of the EU-ESA Framework Agreement[30]. Its initial goal was to reach a shared understanding of the European Space Policy and its implementation. This referred to the future European Space Programme as well[31]. It is also involved in preparing meeting of the Space Council. The HSPG ensures cooperation between ESA and EU on a more regular basis. The Joint Secretariat ESA/EU also foreseen in the Framework Agreement is responsible for preparing the work of the HSPG.

The HSPG consists of high-level representatives of the responsible Ministries of the Member States at Head of Department level, the EC, and ESA. It is jointly chaired by the ESA DG and a high level representative from the EU Commission. Decisions in the HSPG are taken by consent. The preparations of the High Level Space Group until 2007

27 http://www.osce.org/publications/sg/2007/10/22286_1002_en.pdf
28 http://ec.europa.eu/comm/space/doc_pdf/agreement_en.pdf
29 http://register.consilium.europa.eu/pdf/en/07/st10/st10037.en07.pdf
30 http://ec.europa.eu/comm/space/doc_pdf/agreement_en.pdf
31 http://ec.europa.eu/comm/space/news/article_1223_en.html

mainly encompassed the different elements of the European Space Policy and its strategic objectives and they led to an ESP draft for the Space Council.

2.5.4 European Interparliamentary Space Conference (EISC)

The European Interparliamentary Space Conference, envisaged as a tool for interparliamentary cooperation in the space field, was created in 1999. It brings together members of national parliaments that are interested in space. National parliaments of Member States of the EU or ESA that have created a parliamentary body dealing with space affairs are permanent members. Parliaments that have not created such a body are associated members[32].

EISC constitutes a platform for debating the European Space Policy. Moreover, it analyzes current issues within the space sector of Europe, and it adopts resolutions on all space related matters. Despite their non-binding character, these resolutions are communicated to the national parliaments and governments for consideration. Each year, EISC holds a conference which is organized by the rotating presidency in its home country. The conference of 2007 took place in Rome[33], the one of 2008 will take place in Prague.

2.6 National Projects and Cooperation Schemes

As mentioned before, the European Union's CFSP and the ESDP are handled within the realm of the second pillar, constituting the voice of the Member States. Apart from the European structures, Member States tend to conduct a major share of their security-related space activities at the national level and will probably continue to do so. These efforts are often flanked by bi- or multilateral cooperation supplementing own capacities.

A European architecture for space and security will have to account for these national activities, seeing them as a complement rather than competition. In the following, some examples from the Earth Observation sector are considered for completeness' sake. By contrast to the preceding subchapters, this time the focus will not be on the actors, but on the programmes and their interaction to illustrate the full potential that can be exploited in a European approach.

The German SAR-Lupe system consists of 5 Radar satellites on polar orbits launched by Russian Cosmos 3M rockets. The system will deliver imagery with a maximum resolution of below 1 m on a 7/24 basis, regardless of weather conditions or illumination. Designed for the armed forces as Germany's first military satellite system, the programme costs amount to EUR 300 million[34].

A bilateral cooperation agreement between Germany and France was signed in 200235. It foresees data exchange between SAR-Lupe and the complementary French led optical Helios 2 system, starting in 2009. Mutual requests for satellite imagery are transmitted to the partner who integrates it into the planning process of its satellite system. The data is then directly provided to the partner for analysis and archiving. At the European level, SAR-Lupe imagery is also planned to be provided to EUSC.

In contrast to SAR-Lupe, the Italian COSMO-Skymed system (COSMO stands for Constellation of Small Satellites for Mediterranean Basin Observation) has been specifically devised as a dual-use system[36], disposing of duplicated ground segments for civilian and military users. In its final configuration, it will consist of 4 Radar satellites on sun synchronous orbits, two of which have already been successfully been launched by US Delta II rockets. Operating in three different modes (routine, crisis, emergency) with different reaction times, the system will deliver imagery with a maximum resolution of below 1 m. The programme costs are about EUR 1 billion.

At bilateral level, there is cooperation with Argentina and its SAOCOM satellites to form the civilian SIASGE (Sistema Italo-Argentino de Satélites para Gestión de Emergencias) project for monitoring and reacting to environmental emergencies[37]. COSMO-Skymed is also planned to contribute to the French-Italian ORFEO (Optical and Radar Federated Earth Observation) system together with the complementary French optical Pleiades satellites. At European level,

32 http://www.belspo.be/belspo/eisc/pdf/Charter2006_en.pdf
33 http://www.camera.it/eisc2007/inglese/67/schedabase.asp

34 http://www.ohb-system.de/pdf/sar-lupe-broschure.pdf
35 http://www.bwb.org/01DB022000000001/vwContentByKey/W26FTE79283INFODET
36 http://www.asi.it/SiteEN/ContentSite.aspx?Area=Osservare+la+Terra
37 http://www.conae.gov.ar/emergencia/capacidad/sld001.htm

COSMO-Skymed imagery is planned to be used by the EUSC. Beyond that, it is foreseen to contribute to GMES.

Regarding multilateral cooperation, there are some initiatives outside the existing official European structures. Apart from industry cooperation in the Letter of Intent (LoI) Group, and joint armament efforts in the frame of OCCAR (Organisation Conjointe de Coopération en matière d'ARmement), European countries aim at further integration of future Earth Observation capabilities in the framework of BOC (Besoins Operationnels Communs) and MUSIS (Multiple Users Space Information System).

The classified BOC document "Common Operational Requirements for a European Global System of Observation by Satellite" was signed by Belgium, France, Germany, Italy and Spain in 2002. Greece joined in 2003. The BOC aim is to harmonize operational requirements and national Earth observation programmes. It also aims at identifying what is needed to build an independent European military Earth observation satellite system to support peacekeeping missions and other European joint operations. The document foresees granting the European Union access to a resulting network[38].

A further step was taken in 2006 when the BOC states and Sweden as an observer country signed an agreement aiming at defining a future European system for space-based surveillance and reconnaissance called MUSIS. The corresponding work to be performed is twofold: On the one hand, it consists of defining a global architecture answering the needs in the field of Earth observation and serving as a basis for future optical and Radar satellite programmes. On the other hand, MUSIS will require defining a multi-sensor user ground segment allowing each country to have access to all the satellites of the future system through a unique entry point.

The common need for European Earth Observation capabilities, especially in the framework of ESDP, and the fact that the present European systems will reach the end of their technical lifespan from 2014 on could boost the development of MUSIS. The future system could follow up on existing cooperation programmes like the ones mentioned above and provide participating states with access to different types of Earth observation. A common system would improve the general reconnaissance capability, reduce access time and lower the costs, compared to setting up various national systems.

However, progress within the scope of MUSIS seems to be slow due to unclear funding mechanisms. There are voices suggesting that the effort put into MUSIS should rather be dedicated to the EUSC, which already provides a basis for the kind of cooperation that MUSIS is aiming at. These claims are supported by the fact that eighty percent of the imagery that EUSC used in 2007 was of US origin and that the highest-resolution data at EUSC disposal is not coming from European satellites[39].

To give an idea about the number of security-related programmes and missions at the national level that should be integrated into a European approach, the most relevant national activities are listed below, along the categories of Earth Observation, Communication as well as Intelligence and Early Warning:

Earth Observation
- COSMO-SkyMed (Italy)
- SAR-Lupe (Germany)
- Helios 1/2 (French led)
- Pleiades (France)
- Spot (France)
- SEOSAT (Spain)
- SVEA (Sweden)
- TopSat (UK)

Communication
- Inmarsat-4 (UK)
- Hispasat (Spain)
- SatcomBw 2 (Germany)
- Sicral1/2 (Italy)
- Skynet 4 (UK)
- Spainsat (Spain)
- Syracuse II/III (France)
- XTAR-EUR (Spain)

Intelligence/Early Warning
- Clementine (France)
- ELISA (France)
- Essaim (France)
- Spirale (France)

38 ESA/C(2007)135. Basic Information Concerning Space and Security

39 Satellite Center Struggles for Acceptance From European Governments. Space News, 19 May 2008

3. Past and Present Interaction

In the following, the development of the interplay between the European entities involved in space and security will be sketched. This will be done in a chronological order, starting in 1992 with the so called Petersberg Tasks of the Western European Union. The transatlantic implications will not be considered due to the primarily European scope of this report. Listing the most important documents with their most prominent features, along with relevant actions and events, this chapter aims at explaining the political and legal basis for the present state, laying the foundation for problems to consider when adapting the current system to present and future challenges.

In 1992, the Ministerial Council of the Western European Union (WEU) in view of a potentially unstable Eastern Europe after the end of the Cold War adopted the Petersberg declaration[40]. The WEU Member States stated the readiness to make military units of their conventional forces available to WEU, EU and NATO[41]. The declaration also contained the so called Petersberg tasks of activities in the humanitarian and rescue domain as well as in crisis management, including peacemaking missions.

As described before, the Treaty of Maastricht[42] entered into force in 1993. It is the founding document of the European Union (EU). Besides removing the separation between political and economic integration and introducing the well-known economic and monetary union, it created the present pillar structure of the EU. The Common Foreign and Security Policy (CFSP) became the second pillar. One of its five objective was given "to strengthen the security of the Union and its Member States in all ways", expressing a wholistic approach. Tools like common positions or joint actions were implemented and the WEU was included into the CFSP with the role of elaborating and implementing decisions of the Union with defence implications.

In 1997, the Treaty of Amsterdam[43] was signed. It developed and institutionalized the CFSP by creating a "High Representative for the Common Foreign and Security Policy" and establishing the tool of common strategies. Furthermore, it partially introduced majority voting in CFSP matters, albeit to a very limited extent and under strict conditions. Apart from that, the Petersberg Tasks were integrated into the Treaty of the Union. Cooperation with the WEU was intensified. The role of the latter was seen to provide the Union with access to defence capabilities. On top, intergovernmental cooperation within the realm of the third pillar was intensified with a view to establishing Europe as an area of freedom, security and justice.

In 1998, the United Kingdom and France in the Initiative of St-Malo[44] called for an independent European defence capacity, declaring that "the Union must have the capacity for autonomous action, backed up by credible military forces, the means to decide to use them, and a readiness to do so, in order to respond to international crises". At the same time, the Kosovo War showed that Europe was still dependent on information from abroad for its own decisions.

In 1999, the European Council of Cologne launched the European Security and Defence Policy (ESDP) as part of the CFSP[45]. It called for a "gradual framing of a common defence policy which might in time lead to a common defence". Later that year, the European Council of Helsinki agreed on the Headline Goal 2003, the so called "Helsinki Headline Goal"[46]. Hereby, the Union aimed at gaining the ability to carry out the full range of the Petersberg Tasks by quickly deploying and sustaining an appropriate amount of forces up to corps level. The European Council of Feira in 2001 then stated that ESDP could only be successful by combining military and civilian needs[47].

40 http://www.weu.int/documents/920619peten.pdf
41 http://europa.eu/scadplus/glossary/petersberg_tasks_en.htm
42 http://www.eurotreaties.com/maastrichteu.pdf
43 http://www.europarl.europa.eu/topics/treaty/pdf/amst-en.pdf
44 http://www.atlanticcommunity.org/Saint-Malo%20Declaration%20Text.html
45 http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/kolnen.htm
46 http://ue.eu.int/uedocs/cmsUpload/Helsinki%20Headline%20Goal.pdf
47 http://www.europarl.europa.eu/summits/fei1_en.htm

The Report "Towards a Space Agency for the European Union" by Carl Bildt, Jean Peyrelevade and Lothar Späth (also called the "Three Wise Men Report") in 2000 stated that[48]

- ESA should become the EU's space agency and should therefore extend its field of activities to defence requirements
- ESDP is incomplete without a space component
- Earth observation, navigation and communication are ESDP related applications
- such activities would not collide with the ESA convention
- it was logical to use the capabilities of ESA for the development of the more security-oriented aspects of the European Space Policy.

The Treaty of Nice [49], signed in 2001, incorporated the WEU crisis management tasks into the Union. As a result, the WEU lost its significance for the CFSP. In the Marseille Declaration [50] of 2000, WEU ministers had already approved the residual functions and structures of the WEU and acknowledged the take-over of the WEU Satellite Centre and Institute for Security Studies by the EU. The Treaty of Nice also renamed the Political Committee to Political and Security Committee (PSC) and enhanced its role. If authorized by the Council, it may now take the necessary decisions to ensure the political control and strategic direction of a crisis management operation for its purpose and duration. The mandating European Council of Gothenburg in 2001 issued a Council Resolution stating the need to "achieve by 2008 an operational and autonomous European capacity for global monitoring for environment and security"[51].

Later in 2001, the European Council of Laken launched the European Capabilities Action Plan (ECAP) [52], based on the principles of enhanced effectiveness and efficiency of European military capability efforts, a bottom-up approach to European defence cooperation, coordination between EU Member States and cooperation with NATO and the importance of broad public support. The ECAP involved some twenty panels consisting of Member States' military experts putting forward proposals and suggestions regarding deficiencies and potential solutions.

In 2002, the Satellite Centre in Torrejón was transferred from the WEU to the EU, along with the Institute of Security Studies. EUSC became the first operational space entity of the EU. The same year, the BOC document "Common Operational Requirements for a European Global System of Observation by Satellite" (classified) was signed by five European countries (see chapter 2.6).

The European Council in 2003 endorsed the European Security Strategy (ESS)[53], affirming Europe's role in the world. The ESS had been drafted under the auspices of the High Representative and it aimed at responding to the needs addressed in the ESDP. Terrorism, proliferation of weapons of mass destruction, regional conflicts, state failure and organised crime are seen as key threats. Taking a broad approach to security, including military and civilian aspects, Europe's strategic objectives are summarized as addressing the threats in a proactive manner, building security in Europe's neighbourhood and working towards an international order based on effective multilateralism. In pursuing them, the EU is summoned to combine its different instruments and assets.

During the same year, a "Green Paper: European Space Policy"[54] had been prepared by ESA and the European Commission. It acknowledged the importance of space for CFSP and ESDP as well as for enhancing the security of European citizens, it underlined the common features of civil and military space technologies, it pointed to the lack of cooperation between existing programmes and it stated that GMES could be used as a European observation system serving defence purposes.

Later in 2003, the European Commission presented the White Paper "Space: a new European frontier for an expanding Union: An action plan for implementing the European Space Policy"[55]. It stated that

- space technology, infrastructure and services are an essential support to CFSP and ESDP
- space assets shall be used for identifying potential security threats and humanitarian crisis in an early stage

48 http://esamultimedia.esa.int/docs/annex2_wisemen.pdf
49 http://eur-lex.europa.eu/en/treaties/dat/12001C/pdf/12001C_EN.pdf
50 http://www.weu.int/documents/001113en.pdf
51 Council Resolution 2001/C 350/02 (13.11.2001)
52 http://consilium.europa.eu/uedocs/cmsUpload/European%20Capability%20Action%20Plan%20-%20Excerpt%20Press%20Release%20November%202001.pdf
53 http://www.consilium.europa.eu/uedocs/cmsUpload/78367.pdf
54 http://ec.europa.eu/comm/space/doc_pdf/greenpaper_en.pdf
55 http://ec.europa.eu/comm/space/whitepaper/pdf/whitepaper_en.pdf

- military applications feature special requirements, which have to be considered when deploying multiple-use assets
- developments are needed in the area of global monitoring, positioning, navigation, timing, communication, signal intelligence, early warning and space surveillance
- GMES should be used for security purposes.

Also in 2003, a report on "Space and security policy in Europe" funded by ESA and coordinated by the Istituto Affari Internazionali was published [56]. Given the development of dual use technologies, it called for a "'European' approach to space security, linking the present national defence programs with mainly civilian European programs" and considering space operations a continuum including civilian and military features. It also suggested ESA to take full advantage of the dual-use nature of space through a cooperative agreement with the EU and to establish an independent space committee of European experts by the European Council.

In 2004, the EU-ESA Framework Agreement[57] entered into force, providing a legal basis and appropriate operational arrangements for an efficient and mutually beneficial cooperation between the two institutions, aiming at a "coherent and progressive development of an overall European Space Policy". Furthermore, it states that "bearing in mind the nature of space technologies and infrastructures, both Parties, in implementing this Agreement, shall take into account their security dimension." Another element of the Agreement was the creation of the Space Council. To facilitate interaction, an ESA liaison office in Brussels was installed. At its first meeting in 2004, the Space Council defined space as a shared competence of the EU and ESA, and it acknowledged the importance of space activities for a wide range of European policies

Also in 2004, the European Council agreed on the "Military Headline Goal 2010"[58]. Member States committed to be capable of responding "with swift and decisive action applying a fully coherent approach" to all kinds of crisis management operations foreseen in the Treaty of the EU or the ESS by 2010 at latest. Additionally, the needs not addressed by the previous headline goal, e.g. strategic airlift and sealift, were to be fulfilled. In parallel, the "Civilian Headline Goal 2008" [59] was agreed upon. It calls for pushing the development of civilian capabilities in line with the military ones. The same year, the ESA Council took note of and approved a position paper on "ESA and the defence sector" [60] dating from 2003. It suggested that the "peaceful purposes" of the convention do not exclude dual-use activities as long as they are not aggressive.

Also in 2004, the Assembly of the WEU issued the report "The Space Dimension of the ESDP" (Recommendation 755 of the WEU Assembly) [61]. It outlines the overall importance of space systems for implementing EU policies and the strategic importance of disposing of access to space. Moreover, it considers European cooperation in the military use of space as advantageous for budgetary reasons and it states that such cooperation hardly exists to date. Besides, it suggests that EDA could play a vital role for the definition of joint requirements, joint research, and joint procurements and that future capabilities have to adhere to the requirements resulting from the envisaged missions defined under the ESDP (ESS, Headline Goal 2010). Some proposals and recommendations are made by the Assembly, like:

- a link between ESA and EDA
- interoperability and exchange of European capabilities
- real-time image-processing capacity for the European Satellite Centre
- better use of space-based systems for border control (especially maritime zones)
- a space based capacity to detect missile launches
- a policy for preservation of European autonomous satellite launch capability
- autonomous European capacities for verification and analysis of sensitive data relevant for decision making in crisis situations
- a network of already existing defence related systems as a first step

56 http://www.iai.it/pdf/DocIAI/Space&Security.zip
57 http://ec.europa.eu/comm/space/doc_pdf/agreement_en.pdf
58 http://ue.eu.int/uedocs/cmsUpload/2010%20Headline%20Goal.pdf
59 http://register.consilium.eu.int/pdf/en/04/st15/st15863.en04.pdf
60 ESA/C(2003)153. Position Paper on ESA and the defence sector.
61 http://www.assembly-weu.org/en/documents/sessions_ordinaires/rpt/2004/1881.html

Apart from that, the Council of the EU approved the document "European Space Policy: ESDP and Space" [62] in 2004. It stressed the importance of space capabilities for the ESDP and called for a roadmap for the development of effective and coherent space capabilities necessary to fully implement the ESDP. Apart from that, it provided for identified and agreed upon ESDP requirements to be reflected in the global EU Space Policy and its corresponding European Space Programme. It also called upon Member States to increase cooperation by sharing and pooling space assets and capabilities as well as through third-party agreements and by making maximum use of dual-use technology[63].

In 2005, the Council of the EU issued a Draft Initial Road Map[64] as a follow up of the "ESDP and Space" document. It specified the steps necessary to meet the goal of elaborating a roadmap as demanded by the latter. It stated that "civilian and military needs for all actions in the field of the use of space assets for ESDP purposes are compatible, with potential for synergy".

The same year, the "Report of the Panel of Experts on Space and Security" (SPASEC Report) [65] was written for the European Commission. The purpose of the report was to provide the Commission with expertise on the security issues raised in the White Paper and to identify common needs and requirements for European cooperation. The panel was composed of representatives from national space agencies, international organisations and various other institutions. In the report, security is understood in a broad sense as to include civil and military aspects, response to terrorism, and natural disasters. The report reiterates the five key threats identified by the ESS: terrorism, proliferation of WMD, regional conflicts, state failure and organised crime. It states that in order to meet the goals of the CFSP, European countries have to transform their capabilities, considering the role of space. It also emphasizes the importance of increased interoperability against the background of trend to network enabled capabilities. Generally, the lack of interoperability and the lack of an assessment mechanism for the aggregation of needs is considered a capability gap, just as the lack of a European SSA system. The report proposes to:

- establish a platform/forum for consolidating the security related user needs; its activities should be linked to the work of EDA
- subsequently build up a system for global situational awareness
- enhance the security of critical infrastructure in the space sector (space assets and ground facilities)
- implement focussed demonstration projects.

In 2006, the Council of the EU adopted the document "Generic Space System Needs for Military Operations"[66], which was a follow-up to the Draft Initial Road Map and highlighted in detail the ESDP requirements for space-based capabilities. It called for identifying possible dual-use capabilities. The Council also adopted the document "Outline of Generic Space System Needs for Civilian Crisis Management Operations" [67], which underlined that many needs and requirements for space systems for military crisis operation are equally applicable to civilian crisis management operations[68].

The same year, the ESA Director General released the Agenda 2011[69], calling for the exploitation of synergies between the needs of civilian and defence space services. Apart from that, a working group on "Space and Human Security"[70], which had been initiated by the ESA Director General, issued its report, attributing specific importance to the security relevance of GMES and Galileo. Besides, it stated that "a European Space Policy should encompass the European way of approaching security problems".

Also in 2006, the EDA Steering Board endorsed the document "An initial long-term vision for European defence capability and capacity needs"[71], which had been developed by experts to provide an outlook on future defence needs for ESDP operations, looking two decades ahead. It stated that military applications have to benefit from civil technological developments and identified strategic key issues like synergy. The latter is understood as combined deployment of military and civil means, including those of

62 http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/st11616_/st11616_en.pdf
63 ESA/C(2007)135. Basis Information concerning Space and Security
64 http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/sede140208roadmapst09505_/sede140208roadmapst09505_en.pdf
65 http://ec.europa.eu/comm/space/news/article_2262.pdf
66 EU Military Committee Document 6091/06
67 Committee on civilian Crisis Management Document 10970/065
68 ESA/C(2007)135. Basis Information concerning Space and Security
69 Agenda 2011. Document by the ESA Director General and the ESA Directors, 16 October 2006, Paris
70 ESA/C(2007)135. Basis Information concerning Space and Security
71 http://ue.eu.int/ueDocs/cms_Data/docs/pressdata/EN/reports/91135.pdf

non-governmental entities. The document does not explicitly refer to space, but its significance for defence capabilities can be derived from the importance assigned to intelligence and information. The MUSIS agreement was signed in 2006, too (see chapter 2.6). Besides that, in July 2006 the working paper "A European Approach to Space Security" for the Center for International and Security Studies at the University of Maryland was published by the Fondation pour la Recherche Strategique[72]. It stated that the European way of approaching security integration could serve as an example to be followed for corresponding efforts in space related security on a global scale. Finally, the study "Europe's Space Policies and their relevance to ESDP" by the Acronym Institute was published in 2006 as well [73]. Having been requested by the European Parliament's Subcommittee on Security and Defence, it stresses inter alia the need to balance the utilization of space for ESDP needs with potentially contradicting wider security requirements derived from the CFSP, with a special view to preventing a destabilizing arms race in outer space.

In 2007, the Resolution on the European Space Policy [74] (ESP) was adopted by the Space Council. The ESP allows the EU, ESA and their Member States to increase coordination of their activities and programmes. The aim is to ensure that Europe can preserve and improve its global competitive position and use the economic and strategic benefits of space for its citizens. The ESP formally introduces the EU as a space actor and establishes a link between space activities and the ESDP. Containing a dedicated chapter on security and defence, it recognizes that space technologies are often dual-use in nature and that Europe can pursue the respective synergy, particularly in the domain of security. Furthermore, it does not preclude the military utilization of GMES and Galileo, and it affirms the need to set up a structured dialogue with the competent bodies of the Member States and within the EU second and third pillar as well as the European Defence Agency.

Later in 2007, the Treaty of Lisbon [75] was signed. It foresees "research, technological development and space" as a shared competence of the European Union with a subsidiary role of the Member States. The treaty calls for establishing appropriate relations with ESA. It strengthens the position of the High Representative and brings about major structural changes. However, its entry into force is uncertain.

Also in 2007, the report "The Cost of Non Europe in the Field of Satellite Based Systems", requested by the European Parliament's Subcommittee on Security and Defence, was published [76]. It stated that "space technologies have evolved to become central enabling assets in modern defence and security systems", and underlined that space can be used to support security in a broad sense. It called for a European security architecture using civil and military systems as well as space based and non-space based technologies.

To sum up, the legal and political development of Europe in the area of space and security, as evidenced by various official documents, has been taking place along different lines, partially running in parallel. One has been the inclusion and implementation of a Common Foreign and Security Policy (CFSP) by the EU, along with the integration of major WEU tasks. Another line was the introduction of a European Security and Defence Policy (ESDP) as part of the CFSP, along with the definition of corresponding military needs, efforts to meet them and suggestions how to unleash the potential that space holds for security purposes. A third line consisted of creating new bodies inside existing structures (like the Political and Security Council and the EU Military Committee) and of clarifying interaction between different bodies (as in the EU-ESA Framework Agreement). All of these endeavours were flanked by position, strategy and policy papers like the European Security Strategy and the European Space Policy. On the whole, these documents serve as a basis for the upcoming modifications and changes.

72 http://www.cissm.umd.edu/papers/files/pasco2006.pdf
73 http://www.acronym.org.uk/space/PE381369EN.pdf
74 http://register.consilium.europa.eu/pdf/en/07/st10/st10037.en07.pdf
75 http://consilium.europa.eu/uedocs/cmsUpload/cg00014.en07.pdf
76 http://www.europarl.europa.eu/activities/committees/studies/download.do?file=19571

4. The Way Forward

Europe intends to be a global power and a worldwide player with a coherent foreign policy that necessarily includes the security dimension. It is therefore imperative for Europe to continue and increase its use of space for security purposes, interpreting the notion of security in a broad sense. In this regard, Europe has to take a multidimensional approach incorporating a well balanced mixture of civilian and military means and taking full advantage of dual-use technologies, which should be seen as an optimum utilization of available assets. The combination of security tools from various domains can be considered as the specific European feature in security matters.

To gain and maintain weight at the global level, Europe must speak with one voice and act coherently. This applies to the domain of space and security as well. To this end, Europe must avoid being divided over issues like the US missile defence plans and must react jointly and decisively to misbehaviour or threats like the Chinese ASAT activity of 2007. Europe must also state and pursue common positions in international fora like the Conference of Disarmament.

As in other policy areas, this touches upon the role of Member States and their positions in respect to the Union as a whole. Internally and externally, Europe must be perceived as more than a lose federation of disparate and partially contradicting national sub-units. Avoiding European standpoints that merely reflect the least common denominator requires Member States' readiness to accept European approaches to space and security that are not fully in line with their national ones.

Europe's space and security efforts have to be in full accordance with international law and have to be guided by the principle of "peaceful uses of outer space", supporting sustainability and avoiding weaponization and an aggressive doctrine. Following these lines, Europe can act as a role model for other space powers, especially emerging ones that might not yet be fully aware of the importance of the underlying rationale to keep space as a common good of mankind.

Successful implementation of such a European approach will be facilitated by an architectural set up for space and security that achieves maximum synergy by assigning unambiguous roles to the different actors and respecting their mandates, competencies and abilities. The way towards a tuned institutional and structural set up will be an evolution of existing structures rather than a revolution bringing about dramatic changes.

The set up will also have to take into account national interests, activities and cooperation schemes at bi- or multilateral level outside the presently existing official European structures. These national efforts should be seen as an enriching complement rather than as dangerous competitors to European endeavours. This perception has to be reflected in the set up, keeping in mind that the national level is and will be of high importance in security and defence matters.

Regarding the relevance of national activities within the European system of space and security, three basic degrees can be distinguished:

- The maximum level would be constituted by a complete re-nationalization of the space and security domain. This would extrapolate present developments like the German SAR-Lupe. Although it is foreseen to exchange data with the French Helios system, the SAR-Lupe system has been planned and set up independently on a national basis. A special case of national activities is constituted by the MUSIS initiative, where national efforts are run on a multilateral basis, but without involvement of European Union structures (see chapter 2.6 for details).
- The minimum level would consist in a complete European centralization of the space and security domain and an integration of all relevant national activities. Contrary to the option above, this would place European entities like the EUSC, or others possibly yet to be created, at the forefront of the European system of space and security. Eventually, it could lead to the installation of a European counterpart to the UN NSSO (National Security Space Office). In the

course of implementing a strictly centralized approach, questions of how to handle existing capability duplications would have to be addressed and solved.

- An intermediate level, representing a variation of the current situation, would allow concurrent activities both at national and European level instead of an either-or-situation. Existing structures could easily be modified to enable such schemes. For example, the Work Programme of the French EU Council Presidency[77] suggests projects of variable geometry initiated by a few countries and open to other nations. If these projects are also made open to European institutions, multi-level cooperation results.

These three alternatives will also impact on the role and the work of ESA, since the latter represents a balance between a centralized entity (i.e. the executive) and national elements (i.e. the Member States). Since there are various and diverse issue areas within the domain of space and security, they can be tackled by different approaches and by adapted degrees of centralization; there is no need for a "one size fits all" strategy. In any case, the decision about the role of the European States and their national activities will have to be taken by themselves, for example in the Council of the European Union.

The European architectural set up for space and security will require a solid financial basis, coordination of funding mechanisms and rules for the utilization of national and European capacities. It has to allow for exploiting the complete security potential of relevant institutions. For example, EUSC has to gain full access to nationally collected imagery data, as laid down before. Also, provision of EUMETSAT data to EU second pillar institutions in a direct way should be facilitated.

The architectural framework has to be scalable, both in terms of size and of content. On the one hand, it has to accommodate for possible growth due to joining of new Member States of European institutions. On the other hand, it has to allow for integration of additional tasks and objectives brought about by possible new policies and strategies. On top, it has to provide adequate interfaces for international cooperation, e.g. with NATO or the United Nations.

To provide a direction and to cope with the challenges ahead, the European Space Policy (ESP) and the CFSP/ESDP have to be brought together and synchronized, taking full advantage of the potential that space and its applications hold for security purposes as well as building upon recommendations and suggestions accumulated throughout the last years. On part of the EU, this will demand a close relationship and coordination of policies, institutions and services of the Commission and the Council. Regarding GMES as a flagship project in space, the role and significance of the security component have to be clarified and pursued.

Experiences from past and ongoing European crisis management operations and military missions like the one in Congo have to be analyzed, evaluated and reflected upon. This relates particularly to the involved space aspects. The experience gained hereby should be used as a feedback and input to the planning of future activities and devising modified concepts of operation. This endeavour should be flanked by scientific studies and research that have to be sufficiently funded as well.

The realization and implementation of the future European Space Situational Awareness (SSA) system, obviously belonging to the dual-use domain, will serve as a testing case for the interplay of relevant institutions. Besides the project's symbolic significance of bringing about European independence in the respective domain, it has implications for the interaction within the architectural set up for space and security. The SSA system is planned to be user driven and needs to take into account the roles of European institutions and Member States, as well as civilian and military requirements, while at the same time respecting commercial interests. The involvement of the EU within SSA remains to be defined. SSA has the potential of becoming the third European flagship project in space. Regarding the integration of civil and military requirements, the SSA initiative will also test the effectiveness of the present work load share between ESA and EDA.

Last but not least, Europe needs a European Space Security Strategy (E3S) as a complementary counterpart to the European Security Strategy. Such a E3S should provide a framework for security related space activities of Europe and its Member States, putting emphasis on the peaceful use of outer space. Besides providing directional guidance and allowing for a coherent approach in Europe, an E3S should also constitute a basis for cooperation in the area of space security

77 http://www.ue2008.fr/webdav/site/PFUE/shared/ProgrammePFUE/Programme_EN.pdf

on the international stage. It should do so by calling for space security to be achieved cooperatively in order to prevent an arms race, by introducing confidence building measures (CBM), by creating a road map, by defining the EU civil-military balance in space, by restricting problematic means and by defining aims and instruments to be used. Beyond the strategic mission, an E3S should comprise an implementation plan regarding the modus operandi in various international institutions. An E3S has already been called for by IFSH (University of Hamburg) and ESPI[78]. The foreseen role of an E3S within Europe's architectural set up for space security can be visualized like in figure 4.1, which shows some of the relevant entities.

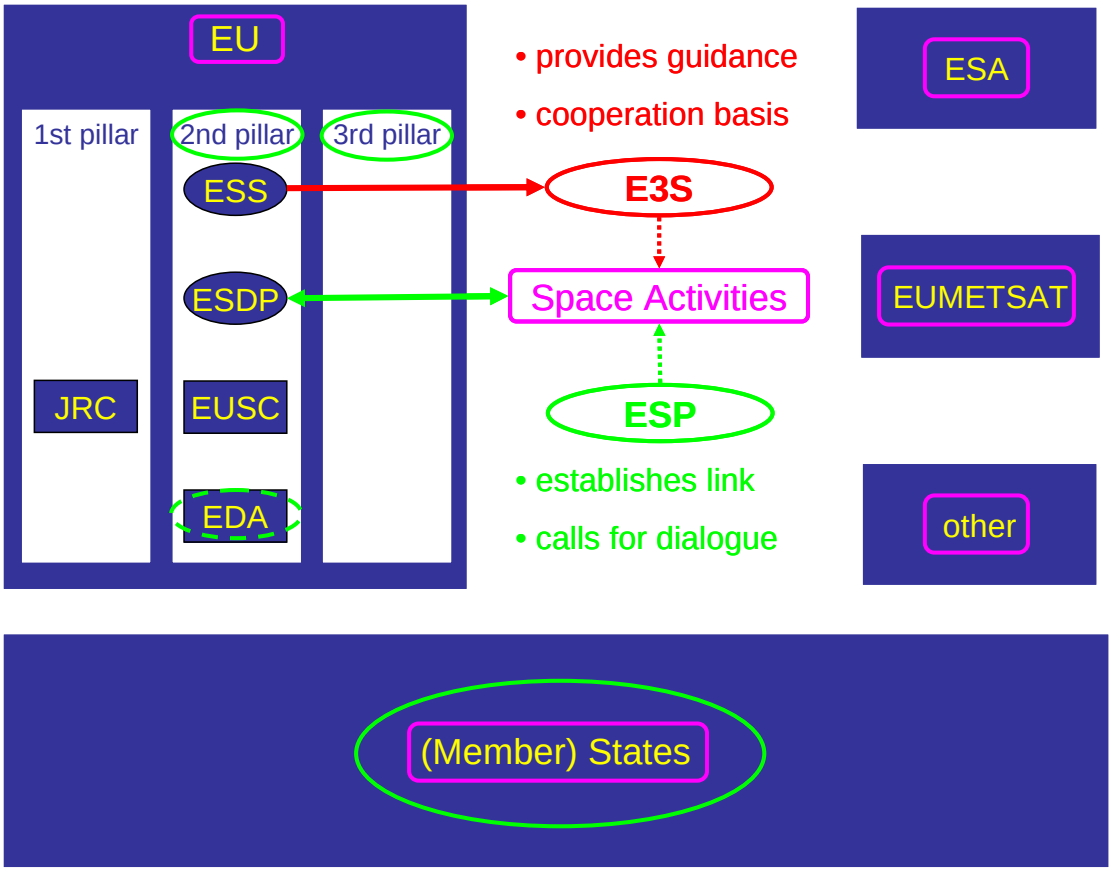

Figure 4.1: Role of a European Space Security Strategy (E3S)

78 http://www.espi.or.at/images/stories/dokumente/studies/memorandum%20on%20e3s.pdf

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Acronyms

ASAT	Anti-Satellite
ASTRO	Advanced Space Technologies to Support Security Operations
BOC	Besoins Operationnels Communs
CBM	Confidence Building Measures
CD	Conference on Disarmament
CEPOL	European Police College
CFSP	Common Foreign and Security Policy
CIVCOM	Committee for Civilian Aspects of Crisis Management
COSMO	Constellation of small Satellites for Mediterranean Basin Observation
DG	Directorate-General
DWD	Deutscher Wetterdienst
E3S	European Space Security Strategy
EAC	European Astronauts Centre
EAEC	European Atomic Energy Community
EC	European Community
ECAP	European Capability Action Plan
ECSC	European Coal and Steel Community
EDA	European Defence Agency
EDRS	European Data Relay Satellite
EGNOS	European Geostationary Navigation Overlay System
EISC	European Interparliamentary Space Conference
ELISA	Electronic Intelligence Satellite
ENVISAT	Environmental Satellite
ERS	European Remote Sensing Satellite
ESA	European Space Agency
ESAC	European Space Astronomy Centre
ESDP	European Security and Defence Policy
ESOC	European Space Operations Centre
ESP	European Space Policy
ESPI	European Space Policy Institute
ESRIN	European Space Research Institute
ESRT	European Security Round Table
ESS	European Security Strategy
ESTEC	European Space Research and Technology Centre
EU	European Union
EUMC	European Union Military Committee
EUMETSAT	European Organisation for the Exploitation of Meteorological Satellites
EUMS	European Union Military Staff
EUROJUST	European Union's Judicial Cooperation Unit
EUROPOL	European Police Office
EUSC	European Union Satellite Centre
FP7	Seventh Framework Programme
FRONTEX	European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union
GDP	Gross Domestic Product
GEOSS	Global Earth Observation System of Systems
GMES	Global Monitoring for Environment and Security
GMOSS	Global Monitoring for Stability and Security
GNSS	Global Navigation Satellite System
GSA	GNSS Supervisory Agency
HR	High Representative (of the CFSP)
HSPG	High-level Space Policy Group
IAEA	International Atomic Energy Agency

IFSH	Institut für Friedensforschung und Sicherheitspolitik (Uni Hamburg)
IPSC	Institute for the Protection and Security of the Citizen
ISFERA	Information Support for Effective and Rapid External Action
ISS	Institute for Security Studies
JRC	Joint Research Centre
LIMES	Land and Sea Integrated Monitoring for Environment and Security
LoI	Letter of Intent
MARISS	Maritime Security Services
MS	Member State(s)
MUSIS	Multiple Users Space Information System
NATO	North Atlantic Treaty Organization
NMS	National Meteorological Services
NSSO	National Security Space Office
OCCAR	Organisation Conjointe de Coopération en matière d'Armement
ORFEO	Optical and Radar Federated Earth Observation
OSCE	Organisation for Security and Co-operation in Europe
PASR	Preparatory Action on Security Research
PJC	Police and Judicial Cooperation in Criminal Matters
PSC	Political and Security Committee
R&D	Research and Development
REA	Research Executive Agency
RELEX	External Relations Directorate-General
SAR	Synthetic Aperture Radar
SEDE	Subcommittee on Security and Defence
SG	Secretary General of the Council
SIASGE	Sistema Italo-Argentino de Satélites para Gestión de Emergencias
SPASEC	Space (and) Security
SPIRALE	Système Préparatoire Infra-Rouge pour l'Alerte
SPOT	Système Pour L'Observation de la Terre
SSA	Space Situational Awareness
TANGO	Telecommunications Advanced Networks for GMES Operation
TIES	Tactical Imagery Exploitation System
UN	United Nations
WEAG	Western European Armaments Group
WEAO	Western European Armaments Organisation
WEU	Western European Union
WMD	Weapons of Mass Destruction

Mission Statement of ESPI

The mission of the European Space Policy Institute (ESPI) is to provide decision-makers with an independent view and analysis on mid- to long-term issues relevant to the use of space.

Through its activities, ESPI contributes to facilitate the decision-making process, increases awareness of space technologies and applications with the user communities, opinion leaders and the public at large, and supports students and researchers in their space-related work.

To fulfil these objectives, the Institute supports a network of experts and centres of excellence working with ESPI in-house analysts.