

 **FORESEC - Europe's evolving security: drivers, trends and scenarios**

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Country report on Germany**

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Appendix A Current security related activities

Abbreviations and Translations

Throughout the report, governmental ministries and offices and organisations are referred to in English, often with the German abbreviation provided in parentheses. The main organisations and their respective abbreviations are listed below.

Auswärtiges Amt (AA) - Federal Foreign Office

Bundeskanzleramt (BK) – Chancellery

Bundesministerium für Bildung und Forschung (BMBF) – Federal Ministry of Education and Research

Bundesinnenministerium (BMI) - Federal Ministry of the Interior

- Bundesamt für Bevölkerungsschutz und Katastrophenhilfe (BKK) – Federal Office for Civil Protection and Disaster Assistance
- Bundesamt für Migration und Flüchtlinge (BAMF) – Federal Office for Migration and Refugees
- Bundesamt für Sicherheit in der Informationstechnik (BSI) – Federal Office for Information Security
- Bundesamt für Verfassungsschutz (BfV) – Federal Office for the Protection of the Constitution
- Bundeskriminalamt (BKA) – Federal Criminal Police Office
- Gemeinsames Terrorismusabwehrzentrum (GTAZ) – Joint Counterterrorism Centre
- Technisches Hilfswerk (THW) – Federal Technical Relief Agency

Bundesministerium der Verteidigung (BMVg) - Federal Ministry of Defence

- Abteilung Haushalt (H) – Budget Directorate
- Abteilungen Personal-, Sozial- und Zentralangelegenheiten (PSZ) – Personnel, Social Services and Central Affairs Directorate
- Abteilung Recht (R) - Legal Affairs Directorate
- Abteilung Wehrverwaltung, Infrastruktur und Umweltschutz (WV) – Defence Administration, Infrastructure and Environmental Protection Directorate
- Hauptabteilung Rüstung (Rü) – Directorate General of Armaments

Bundesministerium für Wirtschaft und Technologie (BMW) – Federal Ministry of Economics and Technology

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) – Federal Ministry for Economic Cooperation and Development

Bundesnachrichtendienst (BND) – Federal Intelligence Service

Bundespolizei (BPOL) – Federal police

Bundeswehr – Federal armed forces

Introduction

This country report on Germany represents one of the 12 country reports that have been compiled as part of the FORESEC project's State of the Art Scan on European security (www.foresec.eu). The scan provides an overview of the security field in the 12 countries chosen. The countries have been selected to give a good overview of the different cultures, geographical locations, national strategies and societal challenges that face European security and shape the priorities and interest at the European level.¹

Section 1 of the report discusses the concept of security in Germany, section 2 looks at current security related activities including organisations, strategies and doctrines, role of the private sector, key technologies and current research programs and projects. Section 3 discusses public opinion in Germany vis-à-vis security related issues. Section 4 gives an overview of current national and international foresight activities and section 5 highlights issues where European level collaboration is seen to potentially add value. Further details concerning each section are provided in the Appendix.

1. Concept of Security

The German external threat assessment is based on the notion that there is no conventional military threat to German territory for the foreseeable future. Instead, the international environment is characterised by a number of connected and de-territorialized asymmetric threats involving an increasing number of actors, including non-state actors. International terrorism, organized crime, the proliferation of weapons of mass destruction and their delivery systems, as well as regional crises are seen as the most pressing threats. Thus the national assessment closely mirrors that expressed in the EU's European Security Strategy adopted in 2003. Globalization, poverty, diseases, competition for natural resources and energy dependency are correspondingly seen as global challenges with security implications.

German security defence policy continues to be defined in multilateral and cooperative terms. For example, in the military realm, only evacuation and rescue missions are envisioned as being conducted in a national framework. Senior German policy makes stress the importance of NATO and the transatlantic link for European security and wish to see a constructive and complimentary relationship between NATO and the EU's European Security and Defence Policy (ESDP). Policy papers highlight that the government employs a wide definition of security which is based on conflict prevention and the idea that the military instrument is but one tool in a wide spectrum of means to be employed only as a last resort. The idea of comprehensive security is captured in the term "networked security" employed in government documents such as the 2006 White Paper on security policy.² Networked security implies an all of government approach in which security policy and response are increasingly formulated across ministerial boundaries.

Security is divided in areas of competence based on German ministries and their respective funding of research programs. The central security issues and the ministries addressing these issues are: general issues of defence, under the Federal Ministry of Defence; terrorism and organised crime, under the Federal Ministry of the Interior; natural catastrophes and human and IT security, under the Federal Ministry of Transportation, Building and Urban Affairs; environmental security, under the Federal Ministry for the Environment, Nature Conservation, and Nuclear Security and the Federal Ministry of Economics and Technology; health security, under the Federal Ministry of Health; and food safety/security, under the Federal Ministry of Food, Agriculture, and Consumer Protection. Germany does not, for the time being, have an official national security

¹ The FORESEC state of the art scan covers Austria, Bulgaria, Estonia, Finland, France, Germany, Italy, Poland, Slovenia, Spain, Sweden and United Kingdom

² Ministry of Defence (2006): White Paper 2006 on German Security Policy and the Future of the Bundeswehr.

strategy document and the 2006 White Paper represents the most comprehensive statement on security policy and has been adopted at cabinet level, thus making all federal ministries stakeholders to the approach formulated therein.

Public opinions polls demonstrate a tendency in Germany to support solutions to problems at a European, rather than national, level. Germans viewed the issues of terrorism, environmental protection, and defence and security in particular as requiring a European solution (92%, 88% and 81%, respectively).³ In general, the threat perception of the population is low. Given Germany's militarist past, a deeply rooted culture of restraint with regards to the use of armed force as a foreign policy tool persists. Therefore, support for international crisis management missions in the society at large remains fragile.

2. Current security related activities

2.1 Organisations

The following organizations are key, though not exclusive, actors contributing to German security.

Organisation	Budget 2008 in Euro
Federal Foreign Office	2,81bn
Federal Ministry of Defence	29,45bn
Federal Ministry of Economics and Technology	6,2bn
Federal Intelligence Service	classified
Federal Ministry of the Interior	5,07bn
Federal Office for Civil Protection and Disaster Relief (part of Ministry of Interior)	101m
Federal Criminal Police Office (part of Ministry of Interior)	362m
Federal Office for Economic Cooperation and Development	4.5bn

The **Federal Foreign Office** is the Ministry of Foreign Affairs. In security terms it addresses issues such as disarmament, arms control, peace policy, conflict resolution and peace consolidation, non-proliferation of weapons of mass destruction, civil crisis prevention, humanitarian international law, and co-operation with international organisations, particularly the EU, NATO, OSCE, and UN.⁴ In 2008 its budget was € 2.81bn. The foreign office staff totals some 5,100. The foreign office has 226 German missions deployed to develop external relations, foster cultural dialogue and promote German identity and national interests.⁵ In the German system, the foreign office has the overall lead on questions of security policy.

The **Federal Ministry of Defence** performs the specific functions of the technical department for military defence, with its efforts centred on planning, politico-military matters, the supreme command and the supreme authority for the administration of the Bundeswehr, the German armed forces, including the armaments organization with a focus on procurement for the armed forces. The ministry has three chief branches: the executive group and its support staff (to include the Special Investigations Branch), the civilian directorates (to include Directorate General of Armaments (Rü) as well as the Personnel, Social Services and Central Affairs Directorate (PSZ), the Budget Directorate (H), the Legal Affairs Directorate (R) and the Defence Administration, Infrastructure and Environmental Protection Directorate (WV)), and the five military staffs.

³ http://ec.europa.eu/public_opinion/archives/eb/eb68/eb68_de_nat.pdf p. 33

⁴ http://www.bmbf.de/pub/research_for_civil_security_.pdf p. 50

⁵ <http://www.auswaertiges-amt.de/diplo/en/Infoservice/Broschueren/AroundTheWorld.pdf> pp. 5, 29, 48

The 2008 defence budget was €29.45 billion. The BMVg has a staff of 3,230.6 The Bundeswehr are some 245.700 active soldiers strong including some 56.000 conscripts. The armed forces can be used for civilian assistance tasks within Germany, for example in cases of disaster relief. The long awaited White Paper on Defence, published in October 2006 under the Grand Coalition government confirms the major choices introduced in the 2003 and 2004 documents but also stresses the need to rethink the internal role of the armed forces: The “central task of the Bundeswehr continues to be national and collective defence in the classical sense. However, the need for protection of the population and the infrastructure has increased in importance as a result of the growing threat that terrorist attacks pose to German territory...For the foreseeable future, the most likely tasks will be the prevention of international conflicts and crisis management.”

The central concern of the **Federal Ministry of Economics and Technology** is economic policy, to include domestic and foreign trade policy and energy policy. The ministry contains eight directorates to reflect each area of interest: Central Administration, European Policy, Economic Policy, SME Policy, Energy Policy Industrial Policy, External Economic Policy, Communications and Postal. The 2008 budget was €6.2bn.⁷ The ministry's central mission is to provide sustained opportunities for the German economy to grow and compete with other economies; ensure a high level of employment; strengthen small and medium-sized companies; promote new technologies and innovation to maintain the economy's competitiveness; link economic and ecological goals; intensify the worldwide division of labour and a free system of world trade; and secure energy supply at an adequate price.⁸ In the area of technology policy, the Federal Chancellor's "Partners for Innovation" Initiative brings together scientific, business, and political communities, as well as trade unions.⁹

The **Federal Intelligence Service** is concerned with foreign intelligence and has two main functions: to procure information from overseas that is relevant to the foreign and security policy of Germany and to evaluate the information in order that the German government is aware of the effects of developments overseas.¹⁰ The budget of the BND is classified. It has an estimated 6.000 staff members and eight divisions: operational intelligence (HUMINT); signals intelligence (SIGINT); analysis; management and central services; organized crime and international terrorism; technical support; BND academy; counter-intelligence and security. This current structure is likely to be streamlined in 2009.¹¹ Oversight responsibilities lie with the Chancellor, the Parliament, the Auditor General's office, and data protection officials.¹²

The **Ministry of the Interior** (BMI) is concerned with a broad spectrum of tasks, including, among others, internal security, policy on foreigners, refugees and asylum, public service, administrative reform, constitutional law, and information society.¹³ The 2008 budget was set at €5.07bn. While the ministry has a total of some 1,400 staff, it is also the supervisory authority for the about 40,000 federal police officers. It is furthermore, the supervisory authority for the Federal Office for Migration and Refugees, Federal Office for Civil Protection and Disaster Assistance, the Federal Office for the Protection of the Constitution; the Federal Criminal Police Office; the Federal Police; the Federal Office of Information Security and the Federal Technical Relief Agency. The Ministry of

⁶ Ibid

⁷ See: <http://www.bmwi.de/BMWi/Navigation/Ministerium/haushalt.html>

⁸ <http://www.bmwi.de/English/Navigation/Ministry/structure-and-tasks.html>

⁹ <http://www.bmwi.de/English/Navigation/technology-policy.html>

¹⁰ http://www.bnd.bund.de/cln_007/nn_354982/DE/Unser_Auftrag/Unser_Auftrag_node.html_nnn=true

¹¹ Spiegel Online (2007): BND-Reform: Deutschlands Schlapphüte werden neu aufgestellt, <http://www.spiegel.de/politik/deutschland/0,1518,513945,00.html>.

¹² http://www.bnd.bund.de/cln_007/nn_354982/DE/Unser_Auftrag/Unser_Auftrag_node.html_nnn=true

¹³ http://www.bmi.bund.de/cln_028/nn_148168/Internet/Navigation/EN/AboutUs/Responsibilities/responsibilities_node.html_nnn=true and

http://www.bmi.bund.de/cln_028/nn_148176/Internet/Navigation/EN/Topics/majorTopics_node.html_nnn=true

the Interior has several domestic security related missions including enforcing the ban on neo-Nazi associations and organisations, combating terrorism, protecting the constitution, combating racism and xenophobia, monitoring left-wing extremism, and fighting crime and its causes.¹⁴

Since December 2004, the BMI runs a **Joint Counterterrorism Centre** (GTAZ) which brings together some 190 staff from the federal criminal police, the federal office for the protection of the constitution, the federal intelligence service, military counterintelligence, the German customs investigation service, the federal office for migration and refugees, and several other law enforcement agencies. The key objectives are to accelerate information sharing across government agencies and to strengthen and focus analysis. The centre conducts daily briefings, threat assessments, engages in operational information sharing, case assessment, structuring analyses, gathers intelligence on Islamist terrorists among other activities.

The **Federal Office of Civil Protection and Disaster Assistance** (BBK) was established in 2004 within the remit of the Federal Ministry of the Interior. It is the central organisation of civil protection and civil defence, to include health-protection measures, protection of cultural property, providing emergency supplies, and enhancing civilian's self-help capabilities, among others.¹⁵ The BBK is funded out of the budget of the Federal Ministry of the Interior. In 2008, the BBK's budget was €101m. The BBK hosts a Joint Information and Situation Centre (GMLZ). Furthermore, the BBK runs the German Emergency Planning Information System (deNIS). Besides the ongoing monitoring of the situation, the GMLZ is primarily in charge of the reception procurement, analysis, processing, co-ordination, circulation and the exchange of announcements and information. Furthermore, the GMLZ is responsible for the prognosis of damage development when an event occurs. deNIS compiles and processes information about civil protection and makes it available to organisations in need of such information. The BBK has several key missions, including: civil defence; emergency planning and information; international coordination; critical infrastructure protection; medical protection of the population; civil defence technology; and research.¹⁶

The **Federal Criminal Police Office** (BKA) is the central agency for criminal police work and law enforcement. Additionally, the office is responsible for international police contracts, conducts overseas investigations (e.g. in the areas of organised crime and offences against state security), and performs protective tasks (e.g. for members of constitutional bodies at the federal level). In 2007, the Federal Criminal Police Office had 4,813 employees. The 2008 budget for the office is €362 million.¹⁷ The BKA's International Coordination Division (IK) is the central division for communications with between the German police authorities and European/international police organizations, including Interpol, Europol, the Central European Policy Academy (MEPA) and the Schengen Information System. There are currently 62 BKA liaison officers working at 51 locations in 48 countries.¹⁸

The **Federal Ministry for Economic Cooperation and Development (BMZ)** is tasked with creating and coordinating developmental policy with partner foreign countries. With a staff of over 600 people and a budget for 2008 at €4.5 billion, the ministry works with host nations to create country strategy reports and to identify priority areas requiring developmental assistance. The BMZ is guided by the United Nation's Millennium Development Goals. External organisations such as the German Development Service (DED), the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ); Capacity Building International, Germany (InWEnt); and KfW

¹⁴

http://www.bmi.bund.de/cln_028/nn_1159784/Internet/Navigation/EN/Topics/InternalSecurity/PoliticalGoals/politicalGoals_node.html_nnn=true

¹⁵ http://www.bbk.bund.de/cln_007/nn_398730/EN/00_Home/homepage_node.html_nnn=true

¹⁶ See: Federal Office of Civil Protection and Disaster Assistance (2007): Protection and Aid for the Population, http://www.bbk.bund.de/cln_027/nn_398720/SharedDocs/Publikationen/Brosch_C3_BCren_und_Faltbl_C3_A4tter_20_Download/Broschuere_Wir-ueber-uns,templateld=raw,property=publicationFile.pdf/Broschuere_Wir-ueber-uns.pdf

¹⁷ <http://www.bka.de/profil/broschueren/facts2007.pdf> pp. 4-5

¹⁸ <http://www.bka.de/profil/broschueren/profile2006.pdf> pp. 14-20

Entwicklungsbank are commissioned by the office to carry out agreements determined between the German government and the host nation.¹⁹

In developing country strategy reports, the BMZ uses a methodology for crisis early warning to classify countries based on their prevention need, their post-violent potentials, and the role of German development cooperation in those countries. Countries' prevention needs charted by colour detailing the countries' prevention needs and status of violence. Prevention needs are classified as either low and in green, heightened and in yellow, or acute and in red/scarlet. These countries are further categorized by status of violence as either at peace/in pre-violent conflict, in violent conflict in sub-regions, in violent conflict, or are in post-violent conflict. The chart is supported by a colour-coded map of each country according to its prevention need. The complete BMZ Crisis Early Warning is based on evaluations by the German Institute of Global and Area Studies (GIGA).

2.2 Strategies and doctrines

White Paper 2006 on German Security Policy and the Future of the Bundeswehr

The White Paper 2006 addresses the fundamentals of German security policy in the 21st century, German security policy in the international environment, and Bundeswehr operations, to include requirements and parameters, transformation, organisation, and personnel. It was drafted in the Ministry of Defence but the whole cabinet has approved the document. In the absence of a national security strategy it represents the base line for German security policy and the role of the armed forces in it. The White Book's strategic importance lies in its introduction of the crucial idea of networked security, which implies a close coordination of ministries such as defence, foreign affairs, interior, economics, and development. The document was drawn up in a process involving several stages which gradually expanded the number of ministries involved. While the idea of comprehensive security policy is firmly anchored in the White Book, the linkage between external and internal security is still underdeveloped.

The White Book focused on the threats of international terrorism, proliferation of weapons of mass destruction and their delivery systems, as well as the destabilising effects of regional conflicts, failing states and the privatisation of force. It favoured reinforcement of the transatlantic partnership, with the United States seen as the bedrock for German and European security. It argued that NATO remained the cornerstone of German security and defence policy, particularly in light of the political and military means it could bring to bear in peacekeeping and peace restoration missions. Acknowledging the previous strained relationship with the US, it called for the transatlantic link to be strengthened through continuous mutual consultation and coordinated action. At the same time, the EU would have to improve its capabilities and shoulder responsibilities for European security. The government saw NATO and the EU as complementary security institutions and pledged to work for better dialogue between them. NATO's comparative advantage was said to be in the field of robust and complex military missions, while the EU's strength was seen to be in the potential to combine a broad range of civilian and military means. The white paper, while acknowledging that international crisis management missions were the most likely tasks and would therefore have overriding influence on the structure and capabilities of the German armed forces, still described national and collective defence as the central task of the armed forces. It pointed to the growing overlap between internal and external security challenges such as terrorist attacks, and argued that the German constitutional framework, the Basic Law – which limits use of the armed forces within Germany strictly to assisting domestic authorities such as the police – needed amendment to address international terrorism. The paper called conscription 'an unqualified success', pointing out that some 20% of deployed German forces had begun as conscripts and extended their service, and arguing that conscription provided the

¹⁹ Introducing the German Federal Ministry for Economic Cooperation and Development (BMZ), 2006

services with a broad range of skills and a vast recruitment pool, as well as anchoring the armed forces in society.

Second Periodical Security Report

The report, jointly owned by the Ministry of the Interior and the Ministry of Justice, provides an overview of the situation and development of crime in Germany, focusing on crime in open public areas and citizens' perception of security. The report includes police criminal statistics (as of 2005) and the criminal justice statistics and links the statistics to types and causes of crime.²⁰ The underlying theme of security policy as defined by the report is 'to provide freedom in safety – on the basis of the law'.²¹ It expands upon the 2001 First Periodical Report on Crime and Crime Control in Germany (1st PRC) and maintains its intent of providing a foundation for a systematic, comprehensive analysis of the available data on the basis of criminological, sociological, jurisprudential and statistical aspects.

The main threats identified by the report include:

- Violent Crime and Selected Offences Committed within Relationships;
- Politically Motivated Crime and Terrorism;
- Theft- and Robbery-Type Property Offences and Fraud-Type Property Offences;
- Economic, Environmental and Corruption Offences;
- Corruption in the Public and Private Sectors;
- Environmental Offences;
- Offences involving Alcohol and Drugs;
- Road Traffic Offences;
- Child and Juvenile Offenders and Victims;
- Immigrant Offenders and Victims; and Professional Criminal Groups and Organised Crime.²²

Each specific area of crime is followed by a section entitled 'Actions and Views of Government'. In the field of counter-terrorism, the government has created a comprehensive strategic approach that has aligned German criminal law with European specifications; enhanced Germany's ability to combat terrorist financing; expanded intelligence tasks and powers; expanded ability to ban specific associations; revising the law on asylum and asylum seekers; improving aviation and maritime security and protecting against sabotage; and enhancing civil protection.²³ Additionally, the Federal Criminal Police Office has been given expanded counter-terrorism (CT) powers, and information exchange is being improved in areas such as communications and through databases accessible to police forces and intelligence services.²⁴

In the field of organised crime, the government seeks to develop its national legal instruments as well as expand its international cooperation through bilateral and multilateral agreements on issues such as cross-border prosecution, training and education in law enforcement, and information sharing.²⁵

National Plan for the Protection of Information Infrastructures

²⁰

http://www.bmi.bund.de/cln_012/nn_148138/Internet/Content/Broschueren/2007/Second_Periodical_Report_on_Crime_and_en.html

²¹ Ibid, p. 15

²² Ibid, p. I, II

²³ Ibid, p. 27-28

²⁴ Ibid, p. 16

²⁵ Ibid, p. 71-72

The report develops the Ministry of the Interior's plan to strengthen and defend Germany's information infrastructure against threats emerging from terrorists and organised crime, with specific targeting of large companies, banks or public institutions. The three main strategic objectives defined in the plan are: prevention (protecting information structures adequately); preparedness (responding effectively to IT security incidents); and sustainability (enhancing German competence in IT/security and setting international standards). The plan calls for collaboration between the state, economy, and society (e.g. private businesses and individual citizens). The Federal Office for Information Security (BSI) is responsible for coordination with these sectors as well others internationally.²⁶ The plan was enacted in October 2005 and has no established end date.

A Security Strategy for Germany

In May 2008, the CDU/CSU parliamentary faction, currently in a coalition government on the federal level with the social democratic party (SPD), presented a draft security strategy for Germany. It is important to realize that this is not an official government document and just expressed the viewpoint of the joint CDU/CSU group in the German parliament.²⁷ Despite the lack of cross-party consensus on the document, the proposed strategy provides breadth and depth to the understanding of German national security and the measures needed to address them. It expands upon security risks and challenges, using those described in the 2006 White Book and European Security Strategy as a baseline, and develops relationships of other dimensions such as climate change that might amplify these risks further. Furthermore, the strategy argues that Germany can only meet the challenges in cooperation with other countries and by pursuing a comprehensive security policy that aims to prevent security challenges from turning into conflicts.

Key goals for German security policy should thus be to fight terrorism, prevent proliferation and promote disarmament, secure access to resources, address the effects of climate change, and to mitigate and resolve conflicts. Following on from this analysis, the CDU/CSU parliamentarians promulgate four consequences for security policy. First, networked homeland security has to be improved in order to deal with major natural disasters, terrorist attacks, or accidents. It is explicitly argued that European coordination in the fields of civil protection and disaster relief should be strengthened. Related to this first insight is also the position to create an unequivocal basis for the domestic use of the armed forces both for disaster relief and combating terrorism. Second, civil-military coordination across different government areas should be strengthened in order to improve the capacity for international crisis management and crisis prevention. Third, the CDU/CSU calls for the creation of a national security council that would provide overarching analysis, civil-military coordination, and the coordination of responses to specific events. Finally, the document calls for a strong partnership between government, the private sector, and researchers in order to develop key technologies. Specifically singled out are communications infrastructure, secure identity technologies, improved detection (terahertz technology), and research that help defending against epidemics.

2.3 Private Sector

European Aeronautic Defence and Space Company EADS N.V. (EADS)

EADS was formed by the merger of DaimlerChrysler Aerospace AG (DASA) of Germany, Aérospatiale-Matra of France, and Construcciones Aeronáuticas SA (CASA) of Spain. The multinational company is involved in aerospace, defence, security and related services. The

²⁶ National Plan for the Protection of Information Infrastructures, pp. 3-9.

²⁷ CDU/CSU Fraktion im Deutschen Bundestag (2008): Eine Sicherheitsstrategie fuer Deutschland. Beschluss der CDU/CSU-Bundestagsfraktion vom 6. Mai 2008.

company had €39 billion in revenue in 2007 and an estimated 116,000 employees, some 112,000 of these in Europe.²⁸

EADS operates through six business segments: Airbus, military transport aircraft (MTA), Eurocopter, Astrium, defense and security systems division, and other businesses. Airbus develops, manufactures, markets, and sells commercial jet aircrafts. The military transport aircraft (MTA) segment designs, manufactures, and sells light and medium transport aircraft in addition to advanced aerostructures and special mission aircrafts. The Eurocopter segment manufactures and sells civil and military helicopters. The defense and security systems division (DS) provides systems solutions, including integrated air systems, intelligence, surveillance and reconnaissance (ISR) systems. The Astrium segment involves all space activities of the company, to include launchers and manned spaceflight, satellites and ground systems and civil and military satellite.

EADS customer base includes global governmental clients (43% in Europe, 24% in North America, 20% Asia-Pacific, 13% rest of the world); commercial clients, such as aviation, commercial satellites, and commercial space companies. Customers also include Border guards and coast-guards, federal and state police, military services, and intelligence services.

Rheinmetall (AG)

Rheinmetall AG is a technology group that specializes in the areas of corporate automotive and defence. In 2007, it had revenues of €4 billion and 19,200 employees.²⁹ The company also works with electronics, weapons systems, and armaments.³⁰ Internal security applications include: border control; protection of facilities and installations; maritime security; disaster management; and equipment for law enforcement police. External security applications include: military camp protection; network-enabled capabilities; future soldier systems; vehicle and turret systems; weapons and ammunition; weapons systems; and unmanned systems.³¹

In the area of defence, Rheinmetall's clientele are international public entities, to include the German Defence Ministry, the Swedish Defence Material Administration, and the Finnish and Swiss armed forces. In the area of automotives, Rheinmetall markets its R&D to automotive industries world-wide.

Siemens AG

Siemens is a leading global electronics company. However, the company covers a broad range of areas, including healthcare and social care, chemicals and pharmaceuticals, and automotive and aviation, among others. In defence and intelligence, Siemens focuses on military resource management solutions, command and control information systems, intelligence solutions and platforms, and identification, localization and security systems.

Key security applications are 'smart cards'; biometric identification applications; integrated critical building systems and contents; security systems; fire detection notification and emergency evacuation systems; and information security. For armed forces operations, applications include: command and control information systems; geo applications; battlefield simulators; and SINAVYCIS Solutions. For defence logistics, applications include: mail and parcel security; supply chain management and integrity; joint optimized logistics; and warehouse automation.

Siemens contributes to both the public and private sector and has supported organisations such as NATO, the Bundeswehr, and the British and US Ministries of Defence. Siemens published a

²⁸ EADS (2008): Facing challenges. Delivering Results. EADS Annual Review 2007.

²⁹ Rheinmetall AG website (<http://www.rheinmetall.de/index.php?fid=863&lang=3>)

³⁰ Businessmonitor International, Germany Defence & Security Report Q3 2007, p. 41

³¹ Rheinmetall AG website (<http://www.rheinmetall.de/index.php?lang=2>)

scenario-based report, "Horizons 2020", designed to create a picture of the development of future political, economic, societal, demographical, technological, and infrastructural fields. The company impacts national security heavily in the area of defence technology. The company's report 'Answers for Defence' identifies its role as contributing to capabilities necessary for network-centric operations, training and simulation, facility security, administration, and focused logistics.

ThyssenKrupp AG

ThyssenKrupp AG is an industrial conglomerate with approximately 191,350 employees in over 70 countries.³² In 2003, Thyssen Krupp's had revenue of €39.3 billion.³³ As an international company, 64% of sales come from customers abroad, particularly in European and North American markets. The company seeks to put more investment in the markets of Southeast Asia, Latin America, Central and Eastern Europe. There are approximately 600 foreign subsidiaries and associated shareholdings.³⁴

ThyssenKrupp performs research in software, electronics, mechanical engineering, process technology, metallurgy and materials science. The 'Discovering Future Technology' Initiative partners the company with science and research organisations, such as the German Centre for Aerospace, technical universities such as the Technical University of Berlin, governmental ministries such as the Federal Ministry of Education and Research. The company's some 3,300 scientists, engineers and other specialists are currently working on approximately 2,000 research and development projects.³⁵

Diehl Stiftung & Co.

Diehl Stiftung & Co. is one of the largest German corporations, with 11,000 employees in 40 independent companies. In 2007, Diehl had €2.2 billion in revenue. Diehl has four main divisions: Metals, Controls, Defence and Aero systems. Diehl's products are for both civil and military applications. In the civil sector, Diehl contributes to the automotive, electric and sanitation industries while in the defence sector, Diehl is responsible for supplying systems, including guided missile, intelligent ammunition, tank tracks, and vehicle maintenance. The company also produces systems and subsystems for avionics. In 2007, Diehl spent €165 million on R&D.³⁶

One of the key areas for future internal security that has increasing input from the private sector is **critical national infrastructure** (CNI), though German ministries are still generally responsible for the financing and direction of infrastructure improvements. The Federal Office for Information Security, a department under the Federal Minister of the Interior, is the overarching governmental department responsible for the protection of German national critical infrastructure. The key areas of critical infrastructure are identified as transportation and traffic; energy; hazardous materials; telecommunications and information technology; finance & insurance; services; public administration and the justice system, among others.³⁷ Largely as a result of the 1997 initiative by the Federal Minister of the Interior, there has been increased inter-ministerial cooperation on CNI, with the Interior taking the lead.

The Federal Ministry of Transport, Building and Urban Affairs also have vital roles in terms of financing the development of critical infrastructures and providing oversight. According to Federal Minister Wolfgang Tiefensee, transportation infrastructure would receive significant funding in 2008, with an estimated 4.7 billion Euros in roads, 3.6 billion Euros in railways, and 800 million

³² <http://www.thyssenkrupp.com/en/konzern/menschen.html>

³³ Germany Defence & Security Report Q3 2007, p. 41

³⁴ <http://www.thyssenkrupp.com/en/konzern/zukunftsmaerkte.html>

³⁵ <http://www.thyssenkrupp.com/en/konzern/kompetenz.html>

³⁶ <http://www.diehl.de/index.php?id=32&L=1>

³⁷ http://www.bsi.bund.de/english/topics/kritis/kritis_e.htm

Euros in funding for waterways.³⁸ Furthermore, in November 2006 the German Parliament adopted a resolution for a scheme to partially privatize the German rail system, opening up investment in rail infrastructure to investors while maintaining the government's ownership of railway infrastructure.³⁹

Other ministries have ownership of different areas of critical infrastructure protection. The Federal Office for Civil Protection and Disaster Response is responsible for physical protection measures while the Federal Office of Criminal Police prosecutes crimes involving damage or destruction to infrastructure, both physical and electronic.⁴⁰ The computer-emergency response team (CERT), under the remit of the Federal Office for Information Security, also unites governmental agencies and some members of the private sector in alerting users of security gaps and risks and advising users what to do about those problems.⁴¹

While the German government takes an active stance in protecting critical infrastructure, the private sector undeniably has a significant role. Indeed, according to the Federal Office for Information Security, 90% of critical infrastructures are owned by private entities.⁴² The German government has established partnerships with the private sector particularly in the area of Critical Information Infrastructure Protection (CIIP). In the 2005 National Plan for Information Infrastructure Protection, the Federal Ministry of the Interior brings forth the role of the private sector, which is in charge of most information infrastructure and thus also essential to the plan's implementation.⁴³ Moreover, scientific researched geared toward enhancing the protection of critical infrastructures brings together industry and research institutions under 7th European Research Framework Programme.⁴⁴ One example of a government-private sector partnership is the working group on infrastructure protection (AKSIS), which analyses the interconnectedness of critical sectors and their dependencies on information technology, and develops measures for prevention, response, and comprehensive security management.⁴⁵

2.4 Key technologies

One of the technological sectors experiencing tremendous investment is biometrics. Due in large part to the German government's contributions to the sector to improve anti-terrorism measures, biometrics investment is predicted to rise from €12 million in 2004 to an estimated €377 million in 2009.⁴⁶ This investment has been and will continue to be particularly instrumental in the creation of electronic identification documents. Following agreement in Europe on the introduction of electronic identification, new systems for biometric data (such as fingerprints and facial photos) and multi-purpose smart cards are being created. Visual and electronic security features have been established for passport verification and visas. Siemens is one of lead companies in electronic identification. The Federal Office for Information Security also has contributed to biometrics research, with the 2002 BioFace project being continued in 2005 with the intention of addressing new technologies such as 3D facial recognition systems.⁴⁷

The technology directly impacts individual and company security. Biometrics will be used for passport and visa security. PC and networked (e.g. airline or hospital) information security will be improved. Additionally, smart cards will replace passwords and PIN codes as the central means of identification.

³⁸ <http://www.bmvbs.de/en/Transport/Waterborne-transport-,1898.1007583/Tiefensee-Significant-increase.htm>

³⁹ <http://www.bmvbs.de/en/Transport/Railways-,2077/Railway-reform.htm>

⁴⁰ http://www.bsi.bund.de/english/topics/kritis/ciip_en.pdf

⁴¹ http://www.bsi.bund.de/english/topics/kritis/ciip_en.pdf

⁴² http://www.bsi.bund.de/english/topics/kritis/ciip_en.pdf

⁴³ *National Plan for Information Infrastructure Protection* (2005), P. 7

⁴⁴ *National Plan for Information Infrastructure Protection* (2005), P. 16

⁴⁵ http://www.bsi.bund.de/english/topics/kritis/ciip_en.pdf

⁴⁶ 'The Biometrics Market in Germany 2004-2009: Anti-Terrorism Laws Drive Growth', Soeren Research, June 2004.

⁴⁷ BSI Annual Report P. 49

Other key technologies include generally those which enhance force protection, contribute to civil security, biometrics and genetics, development of material sciences and new materials, communications, aircraft security, and aerospace.⁴⁸ The military has directed its focus to technologies that improve operations in theatre, such as blue force tracking, friend/foe identification and the Alliance Ground Surveillance System.⁴⁹ Moreover, the German military technological priorities align closely with those identified as part of the Allied Command Transformation agenda.⁵⁰ Finally, Germany contributes to European-led technological initiatives seen to enhance security, such as the space-oriented programmes such as Galileo, a satellite radio navigation system that enables location determination and is used by organisations such as transport (for vehicle location, route searching, etc.), the justice system and customs services (location of suspects, border controls), and search and rescue systems⁵¹, and the Global Monitoring for Environment and Security (GMES), whose aim is to provide geo-spatial information to policy-makers. It was suggested in interviews that European collaboration on the regulation of nanotechnology would be necessary. Interview partners repeatedly pointed to biotechnology, nanotechnology, and clean energy as investment priorities including on the European level.

Gross domestic expenditure on R&D reached 2.5 % of GDP in 2005 (a total of over € 56bn), placing Germany among the top ten OECD countries for this indicator (EU 27 average 1.84%). The R&D activities in Germany are mainly financed and performed by business enterprises (almost 67% in Germany; EU 27 average: 55%).⁵² Moreover, investment in knowledge – defined and calculated by the OECD as the sum of expenditure on R&D, on total higher education (public and private) and on software – comprised 3.9% of GDP in 2004.⁵³ Both government and private sector spending on R&D was expected to rise further and is projected to reach a total of 2.7% of GDP in 2008.⁵⁴ Germany spends roughly 3.4% of its defence expenditure of R&D (2006) which amounts to just of € 1bn.

Business sector expenditures on biotechnology R&D are the highest in Germany (USD PPP 1347 million) among the EU countries for which data are available. This corresponds to 3.3% of total R&D expenditures (5.7% in France, 7% in the United States). The majority of biotechnology firms are active in health (65%), followed by agro-food (21%) and industry environmental applications (14%).⁵⁵ One important particularity observed in Germany is the low share of R&D carried out in service sectors (8.3%). In this respect, this country is comparable to France (9.8%), Japan (9.3%) and Korea (7.2%). As regards manufacturing R&D expenditure, it is skewed towards medium-high-technology industries, which accounted for 60% in 2004.⁵⁶

2.5 Current Research programmes and projects

The 2007 European Conference on Security Research was held in Berlin on 26-27 March. The conference launched the 'European Security Research Programme' published under the 7th

⁴⁸ Interview, April 2008

⁴⁹ Interview, April 2008

⁵⁰ Interview, April 2008

⁵¹ http://ec.europa.eu/dgs/energy_transport/galileo/index_en.htm

⁵² <http://www.oecd.org/dataoecd/28/24/39880863.pdf>, p. 1; Eurostat (2007): News Release 6/2007.

⁵³ OECD, <http://stats.oecd.org/wbos/viewhtml.aspx?queryname=464&querytype=view&lang=en>; Eurostat (2007): News Release 6/2007.

⁵⁴ ResearchResearch (2007): Public and Private R&D Spending on the Rise in Germany Figures Show, 18 September, www.researchresearch.com

⁵⁵ <http://www.oecd.org/dataoecd/28/24/39880863.pdf> p. 3

⁵⁶ <http://www.oecd.org/dataoecd/28/24/39880863.pdf>, p. 1

Research Framework Programme 2007-2013.⁵⁷ German actors were also very active in PASR (see Appendix).⁵⁸ Security research has not been funded on a targeted basis at national level to date. Nonetheless, the German government's departmental research institutes (such as the BAM, BBK and BSI), the Fraunhofer Society, the German Aerospace Center, the Research Establishment for Applied Sciences (FGAN) and firms and universities are conducting research aimed at civil security under the German government's R&D funding programmes (in fields such as information and communications technologies, microsystems technology, software, space travel, biotechnology, peace and conflict research).⁵⁹

'Research for Civil Security: The Programme of the Federal Government' (High tech Strategy)

The research programme is designed to create an interdepartmental and European innovation policy that combines technological advancements and a social dialogue to enhance citizens' security.⁶⁰ It is funded by the federal government with the Federal Ministry of Education and Research taking the lead. The programme runs from 2007 to 2010 and has a budget of € 123 million.

The programme has two project lines. Programme line 1 explores 'scenario-oriented security research' and is designed to improve collaboration between the authorities and private sector for security-related infrastructure. Programme line 2 researches interdisciplinary technologies in 'technology interconnections' for areas such as identification of people or hazardous materials.⁶¹ Opportunities addressed by the programme include, among others: enhanced crisis response capability; economic benefits through market expansion and low-cost, widespread distribution of civil security technologies; reinforcement of core competencies; and employment by the government, private sector and European actors of common security solutions. Challenges addressed by the programme include: protection of information against dissemination to unauthorised parties; societal agreements on technologies; and protection of civil liberties.⁶²

The main research themes are to create solutions to reduce the vulnerability of key infrastructure; to create solutions to improve emergency and security services; and to use the market to develop security solutions. The key technologies included in both Programme line 1 and Programme line 2 broadly are: sensor systems, detection and robots; simulation, pattern protection and data input; and information and communication technology.⁶³

'End users' are authorities and state and federal emergency personnel along with state and federal operators of critical infrastructure (e.g. railways, telecommunications). The civil security research programme, though given input by the Federal Ministry of Defence, is not guided by the goals of defence policy. To initially define the technological and social science research topics, a workshop of 250 experts across academia, research, 'end-users', and providers of security technology was conducted.⁶⁴ The intended impact of the programme is to develop new procedures, products, strategies and networks. The 'end-users' in the government, private sector (to include the infrastructure operators and consumers) and EU member states are responsible for applying the results of the research.

⁵⁷ For an overview of the 7th Research Framework Programme 2007-2013, refer to <http://europa.eu/scadplus/leg/en/lvb/i23022.htm>.

⁵⁸ Only PASR projects that had a German project coordinator are included. For the full list of German participation projects, see: http://ec.europa.eu/enterprise/security/articles/article_2007-02-23_en.htm.

⁵⁹ <http://www.ideen-zuenden.de/en/167.php>

⁶⁰ http://www.bmbf.de/pub/research_for_civil_security.pdf p. 6

⁶¹ http://www.bmbf.de/pub/research_for_civil_security.pdf p. 6

⁶² http://www.bmbf.de/pub/research_for_civil_security.pdf p. 10

⁶³ http://www.bmbf.de/pub/research_for_civil_security.pdf pp. 19-21; 24-47

⁶⁴ http://www.bmbf.de/pub/research_for_civil_security.pdf pp. 12; 21

3. Public Opinion

The 2007 Transatlantic Trends poll identified German citizens' threat perceptions by asking whether they thought they would be personally affected over the next 10 years by a list of security challenges.⁶⁵ Grouping responses that suggest a threat perception, on other words those individuals who answered that were either "somewhat likely" or "very likely" to be affected by a certain risk, the following picture emerges:

- effects of global warming: 82% (up from 71% in 2005)
- energy dependence: 88%
- large numbers of immigrants and refugees coming into Europe: 74% (up from 48% in 2005)
- major economic downturn: 55% (down from 71% in 2005)
- international terrorism: 70% (up from 38% in 2005)
- Iran acquiring nuclear weapons: 63%
- Islamic fundamentalism: 57% (up from 29% in 2005)
- spread of a global disease such as avian flu: 52%

However, these figures should not be interpreted as suggesting that threats are perceived to be high. In fact, as a September/October 2007 poll conducted on behalf of the German Ministry of Defence suggests, the overall threat perception is rather low. Some 48% of respondents felt "secure" or "very secure" on an individual level. Only 3% felt "not secure" or "not at all secure". Furthermore, some 40% of respondents thought the national security situation was "secure" or "very secure". The biggest risks perceived by the citizens questioned do have little to do with traditional security challenges. However, some 37% felt "threatened" or "very threatened" by the "global destruction of the environment" and 33% by "global climate change". Economic security is a key issue for some 30%. Issues of war, terrorism or the proliferation of weapons of mass destruction continue to play a minor role in the threat perception of German citizens.⁶⁶

The 2007 Transatlantic Trends poll discovered 87% of German citizens supported the statement that the European Union should take greater responsibility for dealing with these sorts of international threats.⁶⁷ Moreover, it was observed that there was a tendency to support solutions to problems at a European, rather than national, level. Germans viewed the issues of terrorism, environmental protection, and defence and security in particular as requiring a European solution (92%, 88% and 81%, respectively).⁶⁸

According to the 2007 Transatlantic Trends poll, actions that were acceptable to the majority of Germans include: the EU spending more money on aid for development (71% agree); the EU committing more troops for peacekeeping missions (63% agree); and the EU increasing the use of trade in order to influence other countries behaviour (66% agree). Actions that were not supported to address security threats include: the EU committing more troops for combat actions (only 16% agree that it should).

4. Current foresight activities

The German government's 'Civil Protection Research' identifies key risks out to the year 2016 and then prioritises those risks that are most in need of improvement. The Federal Ministry of

⁶⁵ Transatlantic Trends Key Findings 2007, p. 14-21

⁶⁶ Fiebig, Ruediger and Thomas Bulmahn (2007): Sicherheits- und verteidigungspolitisches Meinungsklima in der Bundesrepublik Deutschland. Sozialwissenschaftliches Institut der Bundeswehr, 19 November.

⁶⁷ Transatlantic Trends Key Findings 2007, p. 22

⁶⁸ http://ec.europa.eu/public_opinion/archives/eb/eb68/eb68_de_nat.pdf pp. 2; 33

Education and Research also contributes to foresight activities, with the 2001-2005 'Futur' dialogues and ongoing technological foresight activities on technology R&D priorities.

4.1 National foresight activities

In March 2006, the Ministry of the Interior issued a report entitled "Civil Protection Research: Third Risk Report by the Ministry of the Interior's Protection Commission – Report on the Potential Risks to the Population from Major Catastrophes and Defence Emergencies" which provides long-term outlooks to 2016. The key risks identified in this publication are nuclear/radioactive dangers, biological (e.g. in weapons or through epidemics and pandemics), and chemical capabilities (e.g. in weapons or in civilian production), data network-oriented risks, electromagnetic impulses, and the release of mechanic and thermal energies (e.g. to create explosions, plane and tunnel accidents, etc.).⁶⁹

According to the report, the areas in need of the greatest improvement are, in order of priority: strengthening of the self-help potential of individuals; protection of crucial infrastructure; warning of and information dissemination to the population and civil protection and disaster assistance organisations; supply and care in medical, pharmaceutical and psychological areas; general institutional organisation for emergency supplies; supplies of foodstuffs and drinking water.

The report defines current risks in order of their frequency and then attempts to predict future risks out to the year 2016. Future risks are predicted to have commonalities with current threats but with an increasing prevalence of certain issues in a time of peace. These include first and foremost issues related to health, such as epidemics and pandemics. These changes mainly affect the German people writ large. Consequently, the priority in the report is on creating agency and self-help of individuals first. The consequences of the threats are both national and international, particularly with terrorism, atomic, biological and chemical weapons, natural and environmental disasters, third-world problems, and the continued risk of war.

Another significant foresight activity is the Federal Ministry of Education and Research's 'Futur' research dialogues. The dialogues, conducted between 2001-2005 at a budget of €2-3 per year, involved a broad range of stakeholders and intended to assess future R&D priorities in science and technology. Among the emerging key research priorities raised in the dialogues were socio-economic challenges of educational opportunities, an aging population, health and nutrition, and water management and technological research in the areas of neuroscience, information networks, and bionics.⁷⁰

4.2 International foresight activities

The majority of Germany's international foresight activities are conducted as part of European Union science and foresight reports, such as the Scenarios Europe 2010 project and the IPTS Futures Project.⁷¹

4.3 Identified threats

Perhaps unsurprisingly, drivers and security risks named by the stakeholders by and large complement those identified in official governmental strategies and foresight publications. Among

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http://www.bbk.bund.de/cIn_007/nn_398730/SharedDocs/Publikationen/Publikationen_20Forschung/Band_2059,templateId=raw.property=publicationFile.pdf/Band%2059.pdf p. 8-9

⁷⁰ The European Foresight Monitoring Network, 'Futur – The German Research Dialogue', www.efmn.info.

⁷¹ <http://cordis.europa.eu/foresight/visions.htm>

these are failed and failing states, non-proliferation, the spread of extremism and international terrorism, ethnic violence, energy, scarcity of resources (with an emphasis on water scarcity), issues of demography and migration, and financial and economic instability.

There is also a general consensus among the stakeholders that rising global actors, with particular emphasis on China, Russia, India, and Iran will be significant determinants of the future of international affairs. The relationships of these countries to Germany, and more broadly the EU, as future competitors or partners has yet to be determined. The key issue for Germany with regard to Russia is one of energy. Though Russia's gas reserves can sustain it for the next two centuries, deteriorating infrastructure inhibits Russia's ability to deliver supplies to client countries. There is also uncertainty as to whether Russia's potential energy dominance will translate into political prominence globally. However, it is certain that Russia's position vis-a-vis the EU has the potential for conflict, as has been evident with disagreements over NATO's enlargement and BMD.

China and India are also identified as power centres whose future international behaviour remains uncertain and whose internal stability may weaken at some point in the future which would have dramatic economic consequences for Germany. The seemingly inexhaustible natural resource needs that feed economic growth in China but also India were seen as problematic. The global commons, water, food, air, can only be approached through global solutions and it was suggested that the EU should play a major role here. Furthermore, experts pointed out that Africa may be become a source of conflict for China, Russia, the US and other major players. While, for example, China's involvement in Africa was seen to be helpful in one regard – namely that infrastructure was being built, that jobs were created – there was frustration with China's lack of interest in good governance and the absence of a comprehensive view on the side of China's leaders. In general, there was a perception among German experts that the integration of rising powers into the global system would pose a problem. Specific reference to the BRIC (Brazil, Russia, India, and China) was made in this regard. Europe, alongside the US, would have to be careful that the inevitable transition to a more multipolar world would not lead to a 'West against the rest' syndrome.

The Middle East and Africa as regions are other areas of concern for Germany. In the Middle East, issues of non-proliferation and Iran's nuclear ambitions represent a particular focal point. Within Africa, Sub-Saharan Africa was singled out as a particular worry. However, conditions of fragile states bordering or becoming failed or failing states and widespread corruption persist in the wider context of Africa. The spread of international terrorism in North Africa was mentioned repeatedly not least because of its proximity to Europe.

5. European collaboration

The approach to the security threats identified above changes based, first, on exigency of the problem and second on the geographic proximity of the problem to Germany and the EU. One expert argued regional issues should be addressed first, as their objectives are often more clear and thus can be more easily presented to the public. Thus, a means of prioritizing security threats becomes critical to developing appropriate responses and measures.

A key consideration for the development of a response is what actor or group of actors would be most effective in combating a perceived or real threat. Some experts indicated European collaboration would be more effective when addressing certain levels of threats – domestic, regional, or internal – than others. According to one expert, the EU has the capacity to address regional issues while global issues would be better suited to international organisations such as the United Nations and NATO. It was further suggested that the EU could strengthen its legitimacy in the security field by creating successful and coherent policies internally.

However, the EU must first overcome some problems before it can be an effective regional actor. First, the EU must reconcile goals and priorities established through strategic partnerships and those outlined in the ENP, which can result in the pursuit of contradictory or conflicting policies. Second, European member states individually must possess the political will to make decisions based on long-term security rather than political expediency. One expert noted within Germany, the low public perception of threats leads to complacency and a lack of support for a global security role for the country, such as contributing to operations in Afghanistan. Third, though the member states within the EU might have common threat perceptions broadly, countries will be affected to different degrees by these threats and thus have less vested interest in contributing resources to a specific area of concern.

Similarly, Germany itself is limited by its historical and cultural conception of security. Germany's contribution to military operations continues to be impeded by its culture of restraint. Due to its military history and the national psychological aversion to committing armed forces to combat, Germany will continue to have difficulty selling to its public the need to contribute to preventing international security threats such as terrorism with overseas missions. Furthermore, Germany is perceived to be surrounded by allied countries and thus relatively secure. Indeed, the Transatlantic Trends results demonstrate that excepting international terrorism, the German public is largely concerned with issues of employment, health, and the environment rather than military or defence issues. With the German public's support for European solutions to international threats, Germany will continue to be an ardent supporter of European collaboration on these security issues.

6. Conclusions

German security policy is based on a broad concept of security that is firmly anchored in a multilateral context. The idea of networked security in which various government actors together pursue a comprehensive strategy to address security policy has gained prominence since 2006. However, there remains a key dividing line between internal and external security. While this line is increasingly perceived to be blurred, there has been a lag in implementation by German ministries and the recent debate about the CDU/CSU security position paper demonstrated this problem. In contrast to other states, the distinction between man-made threats and natural hazards is much less pronounced.

An important contextual factor rooted in Germany's militarist past is a deep latent pacifism in the population which leads on the one hand to a preference for civilian means in the international realm and on the other to a reluctance to assign a significant domestic role to the armed forces for example in the field of counter-terrorism. These are preferences that are reinforced by the generally low threat perception among the population with large parts of individuals questioned in different polls feeling secure.

Germany does not, thus far, have a national security strategy. As a result, different documents address aspects of security without a single government strategy bringing together all strands. The most comprehensive document is the 2006 White Paper on German Security although it is focused on external security policy. Its genesis and the fact that it was agreed at cabinet level, thus involving all government ministries, however is a demonstration of the all of government approach German leaders are trying to implement.

Germany has a large and vibrant security and defence industry with world leading private sector expertise in both the civilian and military fields, and the private sector is a source for many foresight activities in Germany. Many government agencies display some scepticism towards electronic foresight processes with a preference for academically driven research. However, for example, the Federal Criminal Police Office has recently expanded its activities in the foresight area.

Technology needs identified during the research for this report focussed on biometrics, in which Germany has expertise and both government and the private sector have undertaken significant investments, nanotechnology, satellite-based navigation and surveillance technologies, and force protection for deployed military personnel. German research organisations and companies have been active in European collaborative projects in the past and the general political support for European integration makes this a promising field even though government spending has been scattered so far.

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Appendix A Current security related activities

Table 1: Organisations

Organisation	Short Description	Mission	Contact Information
Federal Foreign Office	Germany's Ministry of Foreign Affairs	In the German system, the foreign office has the overall lead on questions of security policy. In security terms it addresses issues such as disarmament, arms control, peace policy, conflict resolution and peace consolidation, non-proliferation of weapons of mass destruction, civil crisis prevention, humanitarian international law, and co-operation with international organisations, particularly the EU, NATO, OSCE, and UN.	www.auswaertiges-amt.de
Federal Ministry of Defence	The ministry is the highest authority for issues relating to defence and the armed forces. It is responsible for the command of the army, air force, navy and other parts of the military organisation.	It performs the specific functions of the technical department for military defence, with its efforts centred on planning, politico-military matters, the supreme command and the supreme authority for the administration of the Bundeswehr, the German armed forces, including the armaments organization with a focus on procurement for the armed forces.	www.bmvg.de
Federal Ministry of Economics and Technology	Highest authority for German economic policy, to include domestic and foreign trade policy and energy policy.	To provide sustained opportunities for the German economy to grow and compete with other economies; ensure a high level of employment; strengthen small and medium-sized companies; promote new technologies and innovation to maintain the economy's competitiveness; link economic and ecological goals; intensify the worldwide division of labour and a free system of world trade; and secure energy supply at an adequate price	http://www.bmwi.de/English/Navigation/root.html
Federal Intelligence Service	Germany's foreign intelligence organisation.	To procure information from overseas that is relevant to the foreign and security policy of Germany and to evaluate the information in order that the German government is aware of the effects of developments overseas	www.bnd.bund.de
Federal Ministry of the Interior	Ministry in charge of internal (domestic) security.	Concerned with a broad spectrum of tasks, including, among others, internal security, policy on foreigners, refugees and asylum, public service, administrative reform, constitutional law. It is also the supervisory authority for the about 40,000 federal police officers.	http://www.bmi.bund.de
Federal Ministry for Economic Cooperation and Development	Tasked with creating and coordinating developmental policy with partner foreign countries.	The ministry works with host nations to create country strategy reports and to identify priority areas requiring developmental assistance.	http://www.bmz.de/en/index.html

Table 2: Strategies and doctrines

Strategy	Short Description	Objectives	Actions	Contact Information
White Paper 2006 on German Security Policy and the Future of the Bundeswehr	In the absence of a national security strategy it is the key document outlining Germany's security policy and the future of the armed forces. It has been agreed at cabinet level.	The White Paper 2006 addresses the fundamentals of German security policy in the 21st century, German security policy in the international environment, and Bundeswehr operations, to include requirements and parameters, transformation, organisation, and personnel. The White Book's strategic importance lies in its introduction of the crucial idea of networked security, which implies a close coordination of ministries such as defence, foreign affairs, interior, economics, and development.	The White Book focused on the threats of international terrorism, proliferation of weapons of mass destruction and their delivery systems, as well as the destabilising effects of regional conflicts, failing states and the privatisation of force. It favoured reinforcement of the transatlantic partnership, with the United States seen as the bedrock for German and European security. It argued that NATO remained the cornerstone of German security and defence policy, particularly in light of the political and military means it could bring to bear in peacekeeping and peace restoration missions. Acknowledging the previous strained relationship with the US, it called for the transatlantic link to be strengthened through continuous mutual consultation and coordinated action. At the same time, the EU would have to improve its capabilities and shoulder responsibilities for European security.	www.bmvg.de
Second Periodical Report on Crime and Crime Control in Germany	The report, jointly owned by the Ministry of the Interior and the Ministry of Justice, provides an overview of the situation and development of crime in Germany, focusing on crime in open public areas and citizens' perception of security.	Its intent is to provide a foundation for a systematic, comprehensive analysis of the available data on the basis of criminological, sociological, jurisprudential and statistical aspects.	In the field of counter-terrorism, the government has created a comprehensive strategic approach that has aligned German criminal law with European specifications; enhanced Germany's ability to combat terrorist financing; expanded intelligence tasks and powers; expanded ability to ban specific associations; revising the law on asylum and asylum seekers; improving aviation and maritime security and protecting against sabotage; and enhancing civil protection. Additionally, the Federal Criminal Police Office has been given expanded counter-terrorism (CT) powers, and information exchange is being improved in areas such as communications and through databases accessible to police forces and intelligence services. In the field of organised crime, the government seeks to develop its national legal instruments as well as expand its international cooperation through bilateral and multilateral agreements on issues such as cross-border prosecution, training and education in law enforcement, and information sharing.	www.bmi.bund.de

<p>National Plan for the Protection of Information Infrastructures</p>	<p>The report develops the Ministry of the Interior's plan to strengthen and defend Germany's information infrastructure against threats emerging from terrorists and organised crime, with specific targeting of large companies, banks or public institutions.</p>	<p>The three main strategic objectives defined in the plan are: prevention (protecting information structures adequately); preparedness (responding effectively to IT security incidents); and sustainability (enhancing German competence in IT/security and setting international standards).</p>	<p>The plan calls for collaboration between the state, economy, and society (e.g. private businesses and individual citizens). The Federal Office for Information Security (BSI) is responsible for coordination with these sectors as well others internationally.</p>	<p>www.bmi.bund.de</p>
<p>A Security Strategy for Germany</p>	<p>A position paper by the CDU/CSU parliamentary party and thus not an official government document.</p>	<p>To promote debate on German security policy priorities and to define an agenda for the most pressing adaptations that would be necessary.</p>	<p>First, networked homeland security has to be improved in order to deal with major natural disasters, terrorist attacks, or accidents. Second, civil-military coordination across different government areas should be strengthened in order to improve the capacity for international crisis management and crisis prevention. Third, a national security council that would provide overarching analysis, civil-military coordination, and the coordination of responses to specific events should be created. Finally, the document calls for a strong partnership between government, the private sector, and researchers in order to develop key technologies.</p>	<p>www.cducsu.de</p>

Table 3 Private sector

Name of the company	Short Description	Main activities	Contact information
EADS	Multinational company involved in aerospace, defence, security and related services.	EADS operates through six business segments: Airbus, military transport aircraft (MTA), Eurocopter, Astrium, defence and security systems division, and other businesses.	http://www.eads.com EADS 81663 Munich Germany Tel + 49 89 607 0
Rheinmetall	Rheinmetall AG is a technology group that specializes in the areas of corporate automotive and defence.	Internal security applications include: border control; protection of facilities and installations; maritime security; disaster management; and equipment for law enforcement police. External security applications include: military camp protection; network-enabled capabilities; future soldier systems; vehicle and turret systems; weapons and ammunition; weapons systems; and unmanned systems.	http://www.rheinmetall.de Rheinmetall AG Rheinmetall Platz 1 40476 Düsseldorf Germany P.O. Box 10 42 61 40033 Düsseldorf Germany Tel: +49 211 473-01 Fax: +49 211 473-4727
Siemens	Siemens is a leading global electronics company.	In defence and intelligence, Siemens focuses on military resource management solutions, command and control information systems, intelligence solutions and platforms, and identification, localization and security systems. Key security applications are 'smart cards'; biometric identification applications; integrated critical building systems and contents; security systems; fire detection notification and emergency evacuation systems; and information security.	http://www.siemens.com Siemens Aktiengesellschaft Wittelsbacherplatz 2 80333 München Germany Tel.: +49 89 636 00 Fax: +49 89 636 52 000
ThyssenKrupp	ThyssenKrupp AG is an industrial conglomerate with employees in over 70 countries.	ThyssenKrupp performs research in software, electronics, mechanical engineering, process technology, metallurgy and materials science.	http://www.thyssenkrupp.com ThyssenKrupp AG P.O. Box 10 10 10 D-40001 Düsseldorf Germany Tel.: +49 211 824 0 Fax: +49 211 824 36000
Diehl	One of the largest German corporations consisting of some 40 companies.	Diehl has four main divisions: Metals, Controls, Defence and Aero systems. Diehl's products are for both civil and military applications. In the civil sector, Diehl contributes to the automotive, electric and sanitation industries while in the defence sector, Diehl is responsible for supplying systems, including guided missile, intelligent ammunition, tank tracks, and vehicle maintenance.	http://www.diehl.de Diehl Stiftung & Co. KG Stephanstr. 49 D-90478 Nürnberg Germany Tel.: +49 (911) 947 2492 Fax: +49 (911) 947 3643

Table 4: Key Technologies

Name of the Technology	Short Description	Applications
Biometrics	New biometric data (fingerprints or facial photos, 3D facial recognition) will be used to create electronic identification documents and to develop smart cards which would replace pin codes and passwords.	For example: improvement of passport and visa security through better security features. Information security, for example in companies and other networked organisations such as airlines or hospitals, would be improved.
Force protection	Development of new materials that enable higher protection levels without increases in weight.	Individual body armour for military and law enforcement personnel; vehicle armour for personnel carriers, fighting vehicles, command and control vehicles, reconnaissance vehicles.
Ground surveillance systems	A mix of manned and unmanned airborne radar platforms that can look down on the ground and relay data to military or civilian commanders, providing them with 'eyes in the sky' over a specific area.	To provide situational awareness to military and civilian decision makers during operations or crisis situations.
Global navigation satellite system (GNSS)	GNSS provide autonomous geo-spatial positioning with global coverage. For example, GNSS allows small electronic receivers to determine their location (longitude, latitude, and altitude) to within a few metres using time signals transmitted along a line of sight by radio from satellites. A system consists of a certain number of satellites, ground control centres, sensor stations, uplink stations and receivers.	Commercial applications of GNSS are manifold, ranging from tracking and positioning in the transportation sector to telecommunications (precise network synchronization). Furthermore, all services that require positioning like rescue services, air-traffic and shipping rely to some degree on GNSS. It can also be used for logistical help in tracking military equipment and forces. It can also be used to guide munitions. In non-combat situations, such as border patrols in sensitive areas, exact positioning reduces the risk of inciting tensions, for example, by accidentally violating borders or demarcation lines.
Nanotechnology	Nanotechnology is the creation of materials, devices and systems through the control of matter on the nanometre scale.	For example, nanotechnology could provide increased sensor sensitivity for detecting chemical, biological and nuclear threats or explosives. Products could be extremely small with very low power levels required to run them.

Table 5: Current Research programs and projects

Name	Short Description	Main activities	Contact information
Protection of Air Transportation and Infrastructure (PATIN)	<p>PATIN's main function is to protect the air transportation system against terrorist attacks, to include airport, aircraft, critical ground infrastructure and the information system. The project assessed aspects of crisis management, interoperability and optimisation of security networks and had a budget of some € 3,54m (EU contribution € 2,65m)</p> <p>Main actors: Coordinator: Diehl BGT Defence (Germany)</p>	<p>A threat assessment and risk analysis was undertaken to detect where improvements are needed. The security requirements were defined through a security assessment methodology and the setting of target levels of security. A security case methodology was developed to assess to what extent the security requirements are met by proposed enhancements in operations, procedures, systems and technology. Compliance for operations, procedures, systems and technology was laid down in draft regulations and recommended practices.</p> <p>In the next step, technologies for protection of air transport and infrastructure against different terrorist attacks were identified and analysed. Technologies were assessed with respect to threat analysis, technology availability and maturity, target levels of security and regulations. The complete air transport and infrastructure chain was considered, including information infrastructure, airport, aircraft on ground and aircraft in flight. Based on the description of the current system and the available technologies, concepts were developed for the protection of the critical infrastructure and the airport/aircraft protection system.</p>	<p>Dr. Klaus Scheerer Tel : + 49 7551 89 6790 Fax : + 49 7551 89 4687 E-mail : klaus.scheerer@diehl-bgt-defence.de http://ec.europa.eu/enterprise/security/doc/project_flyers_2007/PATIN.pdf</p>
Hazardous Material Localisation & Person Tracking (HAMLeT)	<p>The main aspect of HAMLeT was to use surveillance technology to track and localize potential threats. The project used sensors, both chemical and video, and had a budget of approximately €318,267 (EU contribution €218,823).</p>	<p>The surveillance technology relies on basic input data for the classification, which is provided by chemical sensors detecting hazardous materials, such as explosives. However, an individual chemical sensor is unable to localize hazardous material and to associate it with potential threats. HAMLeT uses an integrative approach to fuse the output of several chemical sensors with kinematical data from laser range-scanning and video sensors used for multiple persons tracking.</p>	<p>Dr. Wolfgang Koch Tel : + 49 228 9435 373 Fax : + 49 228 9435 685 E-mail : HAMLeT@fgan.de http://ec.europa.eu/enterprise/security/doc/project_flyers_2007/HAMLeT.pdf</p>
Open Robust Infrastructures (ROBIN)	<p>The purpose of ROBIN is to explore technologies for a small, robust platform that can host operating systems and their applications in order to better protect these systems from security attacks. The project's budget is €1,885,061 (EU contribution €1,436,995).</p>	<p>The platform will allow applications to be split into security-sensitive and security insensitive parts while creating an option for the platform to enter an emergency mode. Each university partner has responsibility for a specific aspect of the project.</p>	<p>Prof. Hermann Härtig Tel : +49-351-463 38 282 Fax : +49-351-463 38 284 E-mail: haertig@os.inf.tu-dresden.de http://ec.europa.eu/enterprise/security/doc/project_flyers_2007/ROBIN.pdf</p>

<p>Vital Infrastructures Threats and Assurance (VITA)</p>	<p>The VITA project was designed to assess threats and protect networked infrastructures, particularly trans-national infrastructures, on which the well-being of European citizens and their economies are dependent. The project budget is € 1,364,944 (EU Contribution €1,023,248).</p>	<p>VITA provides methods and approaches for tools and technologies that together raise awareness on the need for vital infrastructure protection. The project also used a scenario exercise on electrical energy to demonstrate VITA's effectiveness. During the project, tools such as the Demonstrator and Model for Critical Infrastructure (CI) Analysis, Operator Training Simulator of the electrical energy provider, and the Human Behaviour Representation measurement and evaluation tool set. Also, stakeholder representatives such as individual operators, the management of individual infrastructures, end users like health, rescue and transportation systems, local crisis management teams and cross-border coordination contributed to a comprehensive participation of actors in the international CI environment.</p>	<p>Rudolf Schäfer Tel : +4989 6088 3061 Fax : +4989 6088 2460 E-mail : schaeferru@iabg.de http://ec.europa.eu/enterprise/security/doc/project_flyers_2007/VITA%20.pdf</p>
<p>Active Terahertz Imaging for Security (TERASEC)</p>	<p>The goal of TERASEC is to improve security against terrorism by enhancing detection of threats, explosives, pathogens and chemicals hidden by a person or inside objects such as luggage. The technology uses Terahertz radiation and sensors and will be used in public places such as airports. The total budget is € 2,977,484 (EU Contribution €2,149,679).</p>	<p>The project evaluated two THz imaging systems and developed accompanying technology while mapping steps for future development and implementation for security applications.</p>	<p>Dr. Heinz-Wilhelm Hübers Tel : +49-30-67055596 Fax : +49-30-67055507 E-mail: Heinz-Wilhelm.Huebers@dlr.de http://ec.europa.eu/enterprise/security/doc/project_flyers_2007/TERASEC.pdf</p>
<p>Study on Geodata and Crisis Early Warning Situation Awareness (GEOCREW)</p>	<p>The GEOCREW project aims to support the early detection of man-made crises that have an international impact and affect the security of European citizens. The project, comprised of the CREW section focussed on integrating different information sources and the GEODATA section focussed in the utilization of geospatial data for improving situation awareness, created an architecture concept for a collaborative secure virtual platform. The project budget was €695,573 (EU Contribution €532,900).</p>	<p>The potential benefits of the project to the EU and member states' intelligence services, crisis and situation awareness centres, and institutes is the integration of data sources ranging from geospatial data to open sources and reports. Ultimately, the architecture concept could contribute to a more comprehensive and effective political crisis early warning system.</p>	<p>Manfred Müller Tel : +49-89-9216-2721 Fax : +48-89-9216-2732 E-mail : mamueller@esg.de</p>