Denkwürdigkeiten

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LEADOFF

Liebe Mitglieder,

Sicherheit ist ein Chamäleon. Dies zeigt nicht zuletzt die Themenpalette dieser Ausgabe der Denkwürdigkeiten:

Die Überlegungen von Heinrich Kreft zur geopolitischen Dimension von Ressourcensicherheit wären in Deutschland über Jahrzehnte hinweg politisch inkorrekt gewesen.

Der Gehalt des Essays von Max Worcester zu den Themen Korruption, Industriespionage und Wirtschaftskriminalität sprengt wahrscheinlich noch immer die Vorstellungskraft der meisten politischen und industriellen Verantwortungsträger in Deutschland; nur dies erklärt deren Desinteresse an nachhaltigen Schutzmaßnahmen.

Marc Oprach zeigt auf, dass Ballistic Missile Defence schon fast ein Thema von gestern ist; denn zunehmend sorgen müssen wir uns um preiswerte und leistungsfähige Cruise Missiles.

Ralph Thiele, Vorstandsvorsitzender

In dieser Ausgabe

THEMEN

The Geopolitical dimension of resource security

Germany and Europe need a Resource Strategy

Resource Security has an often overlooked geo-political and geo-economic dimension. During the various holidays at the end of 2009 and the beginning of 2010 around the globe millions of mobile and smart phones were given as gifts to relatives and friends. For their and the production of other bestselling IT and Computer Equipment many rare strategic metals are needed – mostly in very small quantities. That's why they have been coined "pepper-" or "spice-metals". Despite their small quantity in a single average cell phone they add up as the annual production of mobile phones has passed 1 Billion (!). One of these rare high-technology metals is Indium, which is not replaceable in the production of cell-phone displays. The by far biggest producer of Indium is China. That's why it has set alarm bells ringing for many metalworking companies in industrialized countries when China announced last fall to restrict exports of strategic raw materials.

Raw materials are essential for modern societies. Therefore, a secure supply of raw materials at acceptable prices is of essential importance for Europe.

Increasing energy prices and the repeated gas conflict between Russia and the Ukraine revealed Europe's dependence on oil and gas imports and put it on the political agenda. Comparable problems regarding the supply of non-energy raw materials have not yet reached the same level of political attention, although the supply risks, especially of some high technology metals, are higher than those for gas and oil.

Due to the transformation of numerous developing countries into emerging economies and the resulting high or even growing demand for raw materials in future, the supply situation will presumably continue to be tight. Moreover, raw materials conflicts are be-

coming a growing threat in many producing countries, fuelled by the unequal international access to these resources and a new geography of trade, caused by the rise of the emerging countries.

The private sector, national governments and the EU commission are asked to find ways to attain supply security through appropriate measures at company, state and EU level as well as at the international level. Apart from measures to secure access to raw materials, another significant way to reduce import dependency is to increase resource efficiency and to improve the recycling of secondary and waste materials.

Continuing dependency on raw materials imports

Europe is not lacking in raw materials. Nevertheless, some raw material deposits are included in development plans and are therefore either protected areas or are otherwise set aside for these and thus unavailable in terms of raw material production.

Europe`s economy is considerably or completely dependent on imports of most of its needed raw materials, as for example the import of copper and iron ore, which together with other metallic raw materials that have to be imported, are essential for a number of industries – ranging from the aerospace, automotive engineering to electronic engineering and electrical industries.

Apart from these primary raw materials the economy requires a considerable amount of so-called secondary raw materials, i.e. scrap and waste materials. The need for secondary raw materials has increased between 40% to 60% of the basic raw materials required for the metal production within the EU.
The export industry, which is of great importance to the economy, is a large consumer of raw material imports.
High import dependency also exists in the case of so-called high technology metals such as cobalt, platinum, titanium and rare earths. These strategic raw materials are essential for key industries and therefore for the technological future of Europe. Their importance to the production of technologically demanding products, e.g., for the conversion to a sustainable production and environmentally friendly products, is increasing.

Fundamental changes on world raw materials markets

Supply of raw materials

Given the irrevocable fact that the raw materials component of the earth's crust is finite, nonetheless, there are sufficient mineral resources which can satisfy the worldwide need for raw materials in the long term. High price volatility on the raw materials markets, observable since the turn of the millennium, is not caused, as often wrongly assumed, by depletion of the raw materials. The reserves-to-production ratio is 600 years for chrome and 190 years for platinum metals. Nevertheless, the prices of these and other metals with average reserves-to-production ratios are highly volatile. The market turbulence results from a supply and demand imbalance.

Global raw material supply is tightly linked and therefore open to various impacts, which one state or even individual companies can only control to a limited extent. Market disturbances may be caused by different reasons. These do not mostly result in a complete interruption of the raw material supply, but rather in delayed delivery, concentration processes in the mining industry, accompanied by negative consequences for competition or in instability of producing countries, which can lead to the short notice failure of whole production sites. However, market disturbances also occur – as seen in the past - when through the rapid growth of developing and emerging countries, the demand for raw materials increases unpredictably fast or when revolutionary technological pushes result in peaks of demand or a decline in demand.

The disturbance potential is especially high in cases with no (or no fast) options to substitute scarce and expensive raw materials. Thus, chrome is not substitutable in stainless steels, cobalt not in wear-resistant alloys, indium not in liquid crystal displays and flat screens, and neodymium not in strong permanent magnets.

In addition, there is competition in demand among different economic sectors regarding certain raw materials. For example, tantalum is needed in electric engineering, in steel refinement and in surgery, platinum in chemistry and automotive industry. The strong cross linking of uses of raw material in different industry sectors has to date hardly been explored.

The high volatility of raw materials prices in the past has - to a large extent - its origin in false estimations by market participants, especially by mining companies. A first false estimation consisted of the fact that innovations had not been expected (in time). An example for this is the strong increase in the tin demand and tin price, as a result of the electric engineering industry's conversion to free plumb bobs, since these require a higher input of tin. The impetus of new technologies on the level of demand for raw materials shows the formative force of the technological change. In 2030, the need for some of these high technology raw materials is estimated to be a multiple of the current world production. The demand for gallium and neodymium in 2030 as a result of foreseeable technological innovations is six to three point eight times as high as the current total global production. Thin-layer-photovoltaics and fast integrated circuits are pushing the demand for gallium, in case of neodymium it is the already mentioned high-performing permanent magnets. Information on which innovations trigger a boom for a certain raw materials is strategic information for raw materials companies to attune in time their production capacities to the future need.

The second false estimation concerned the rapid development of the Chinese economy and the resulting import maelstrom of raw materials which came unexpect-

edly for many market participants. China, especially, contributed to the global economy's annual growth from moderate 3.8% over years to 5% since 2004. Fuelled by China's high economic growth, the five year-long raw materials-super cycle reached dimensions we have not seen yet in modern economic history. The global economic and financial crisis made most of the metal raw materials prices fall again from 2008; however, that was for a global economic crisis on a relatively high level.

The developments in China have been the main trigger of the most recent raw materials boom, lasting from 2003 to the economic and financial crisis 2008/2009, but were not the sole cause. The boom is also attributable to the typical cyclic investment behaviour of the raw materials sector. Even though India does not yet play a major role as a consumer on the raw materials markets, this should only be a question of time with view to the fast developing Indian economy. After the confirmation of the reform-oriented government of Premier Minister Singh in the federal elections in May this year, it can be assumed that India remains on the course to reform. China and India are the only large economies, which have grown considerably during the crisis in 2009 by 8% and 5% respectively and will probably even show stronger grow in 2010.

The high, and even in the crisis (after a decline in 2008) currently once again increasing raw materials prices are not a result of a supply shock, but the result of large demand, which was triggered by a strong global economic growth.

For the future, it can be assumed that the growth of India and other emerging countries will considerably influence the demand for raw materials. The economic catching-up of the lesser developed world regions, for instance Africa, is desired and a prerequisite for a peaceful future. The fact that industrialised countries united in the OECD make up only 15% of the world's population, but use 50% of the mineral resources is not acceptable in the long term, neither on a political nor a moral basis. A catching-up development of the poor countries will inevitable increase global economic growth more than the long-term average of the past. But even if the future annual economic growth declines again to annual growth rates of 3.8%, the global economy's performance in 2030 will already be 2.4 times higher than in 2006, which will undoubtedly have a strong impetus on the future demand for raw materials.

The demand for mass raw materials, the so-called commodities, with a broad area of use such as iron and steel, copper and chrome, is likely to be pushed harder in future by the global economic growth, while the demand for high technology metals such as gallium, neodymium, indium etc. will rather be determined by technological progress. Both drivers should have the same effect on the demand for platinum metals, tantalum, titanium and cobalt.

One of the special characteristics of the production of metallic raw materials is the fact that they are often found collectively ("socialised"). Given the rise of ore production due to higher demand for a certain metal, other linked metals are being produced in a larger amount and vice versa. For example, the extremely scarce indium, for example, is extracted as a by-product of zinc. Further, in 2006, when a Japanese zinc smelter was closed, the indium supply decreased noticeably.

With regard to some metals such as platinum, indium and neodymium, the supply security is to be assessed critically for three main reasons. Firstly, these are strategic raw materials for our industry. Secondly, not only the dependency on imports is high, but the number of delivering countries is also small. Thirdly, there is no option to substitute these raw materials. China is the biggest producer of many high technology metals, which it increasingly uses in its own high-tech industry that is currently being developed. For many of these technologies, Beijing has imposed export restrictions, which is particularly serious in those cases in which China, as for example in the case of neodymium, virtually has a monopoly on world production with 97%.

New risks caused by disturbed global markets

The most important mining areas for many high technology metals are in China, Africa, South America, Russia and Australia. Some of these countries and regions are economic or politically unstable, others are characterised by considerable government impact on the economy.

Emerging countries increasingly follow strategies which result in securing their own raw materials processing industries more privileged and less expensive access to domestic raw materials than access for foreign competitors. More than 450 export restrictions for more than 400 different raw materials were identified by the EU. Some emerging countries aim to gain privileged access to countries that are rich in raw materials. Thus, China has taken part in several large-scale projects to tap raw materials deposits in Africa.

Growing concentration and vertical integration of companies within the mining and processing sector was typical during the raw materials price boom. Given the continuing development, this may lead to competitive restrictions and thus to higher (oligopoly) prices.

Over 50% of the most important raw materials deposits are located in countries with a per capita income under ten US dollar per day. For many of these poor raw materials exporting countries the richness in raw materials has turned out to be a "curse". The phenomenon "poverty despite richness of raw materials" can be explained by macro-economic ("Dutch Disease") and political-institutional deficits ("Bad Governance"). Nevertheless, there are two laudable exceptions, namely Chile and Botswana.

More than half of the worldwide raw materials production takes place in countries which are ranked as politically unstable or extremely unstable by the World Bank. Over 50% of the metallic raw materials production solely originates from unstable or extremely unstable countries. In case of some metal ores, the complete world production comes from countries of this category. The political risk that these countries could fail as suppliers due to military conflicts, terrorism or the nationalisation of raw materials sources is relatively high. This danger primarily exists in Central Africa.

Establishment of supply security in globalised markets

Material efficiency increase and resource productivity

The critical dependency of the European industry on certain raw materials shows the urgency for a transition towards a more resource efficient economy and sustainable development. For this, resource efficiency, recycling and substitution as well as the increased use of renewable raw materials has to be promoted. Therefore, higher investments in particular in efficient recycling techniques are required, which cost-efficiently extract secondary raw materials in the quality of primary raw materials. Secondary raw materials are the only noteworthy domestic raw materials source in the case of metals. Recycling also improves energy efficiency, particularly in metal production, since here, the processing of secondary raw materials requires less energy than processing primary raw materials.

Developing domestic raw materials deposits

The development of new raw materials deposits needs to be made possible to secure the supply with domestic raw materials. Therefore, EU member countries should secure a co-equal balance between raw materials extraction and other areas of concern. Within the EU, the general framework also has to be designed in such that the sustainable supply with raw materials from European sources is favoured. Sustainable supply with raw materials from domestic sources requires more knowledge about existing deposits within the EU. By including national geological institutes more into regional development planning and, in addition, which should also be better linked Europe wide, the access to raw materials deposits could be remained open for a later development.

Strategies to secure raw materials imports

Raw material security is an economic good for which the state, in close co-operation with the private economy, has a responsibility to provide.

➔ *Company Level*

Raw materials supply is primarily the task of the companies themselves, but only less than half of companies take measures to insure themselves against raw materials supply risks. For this, companies need a strategic approach, starting with obtaining strategic information about the development of their own needs (considering technological progress and increase of resource efficiency), about threatening raw materials shortages and potential price increases. Different instruments to secure the supply of raw materials, which aim at securing the acquisition of raw materials, recognising and dampening of raw materials shortages and price increases as well as direct communication with raw materials producers and distributors, are available to companies.

A possible way to secure the supply of raw materials is the participation in raw materials mining ("backwards integration"). By this, the opportunities to purchase the raw material in question in sufficient quantities and quality are increased. Further, such participation prevents, to a certain extent negative consequences of supplier concentration. Nevertheless, this participation or even the direct purchase of a raw materials deposit is linked to high financial expenditures and hence, for most of German and European raw materials companies it is not an option.

The security of supply through long-term delivery contracts with a mining company, optionally linked with the agreement for a partnership, is however, for most companies a realistic option. Apart from this, diversification of the distribution relations is a classical instrument to spread the risk. In particular, smaller companies can strengthen their demand power also by cooperating when purchasing, for instance, in the form of purchase corporations. To insure against sudden raw materials price increases, different financial hedging instruments (OTC-Forwards, -swaps, -options and fluctuation margin strategies). Such hedging instruments are only possible for those raw materials that have an official reference price (e.g. stock exchange price). Maintenance of good business relations ("Good Practice") between the partners of a value added chain is another instrument. Hereby, existential crisis of individual parts can be avoided along with ensuring survivability for all.

➔ *National Level*

A reliable access to raw materials, unimpaired by market distortions, is an increasingly important prerequisite for Europe's competitiveness.

Due to the EU's high dependency on the import of raw materials, free global markets without trade distortions are a basic prerequisite for the secure supply of raw materials. Nevertheless, international raw materials markets are considerably characterised by trade and competition distortions. Especially major emerging countries use strategic measures, which distort trade and competition, to secure their own raw materials supply. As a consequence of the financial crisis, further trade distorting measures have been used. It is the state's task to provide open and functional global raw materials markets and to stand up for equal competitive conditions for companies with all available instruments.

The political awareness of this problem has undoubtedly grown in recent years: A few member countries like Germany make trade and competition distortions regarding raw materials part of their bilateral talks. In order to face this problem efficiently, industry has proposed to supplement WTO-regulations by a ban on raw materials export restrictions. However, due to diverging interests of raw materials exporters and importers, this would not be easy to accomplish.

At the bilateral level, making the reduction of export restrictions for raw materials and competition distorting subsidies a condition for concluding trade agreements and for WTO accession agreements could be considered. Bilateral talks should be consistently aimed at reducing trade and competition distorting measures.

Furthermore, the national level assumes the more than important role to contribute with its foreign, development and trade policy instruments to the political and economic stability of countries rich in raw materials. In short: EU member countries need an active and integrated raw materials diplomacy.

➔ *EU level*
At the EU level an active raw materials diplomacy is also required. The European Commission has made the reduction of trade and competition distortions in the raw materials sector an inherent part of negotiations with the countries concerned.

An integrated policy approach at the European level is aimed at to secure Europe's supply of raw materials. The political challenges for the supply with non-energy raw materials are multilayered and complex; they concern economic and environmental policies as well as foreign, trade and development policies. The European Commission has full or partial responsibility for many of the named policy fields. Therefore, the development of a cross-sectoral EU raw materials strategy, which reasonably complements the national strategies, is therefore worth striving for. After being asked by the EU Council for Competitiveness, the Commission has meanwhile begun to develop such an integrated policy approach. In November 2008, it presented a draft for a raw materials strategy, which is based on three pillars: guarantee of non-discriminatory access to the raw materials traded on the global market, reduction of the primary raw materials consumption in the EU and the security of the supply with raw materials from domestic sources. To secure the access to the required raw materials, it strives for a better management of existing strategic partnerships and to multifaceted contacts to most of the states, being relevant in this context, and regional co-operations. The dialogue concerning the access to raw materials in the framework of the current action plan 2008-2010 is particularly to be intensified with Africa. Furthermore, it is planned to intensify the dialogue with emerging countries rich in raw materials such as Russia and China, aiming especially at the abolishment of market-distorting measures (as for example, export restrictions). Finally, there should be a dialogue on shared interests and initiatives to strengthen free global trade with countries similarly dependent on raw materials, such as Japan or the USA. Moreover, the EU aims to commit itself to increased international collaboration and win support for its position within the G8, OECD, UNCTAD and UNEP. The European commitment regarding future questions – as in seabed mining, the Arctic and safeguarding of international trade routes for raw materials - is to be welcomed. In respect of the integrated approach, the EU also counts on its development policy to reinforce national structures in many countries weak in raw materials production and support sustainable raw materials management.

In addition, the EU aims at contributing to an increase of the raw materials supply by promoting an advantageous investment climate. This also includes the demand on the EU competition authorities as well as member states to pay more attention to the concentration processes in the raw materials sectors in order not to endanger supply security with raw materials at acceptable prices by company mergers.

➔ *International Level*
Many of the required measures to secure the raw materials supply in Germany and the European Union are neither to be achieved bilaterally nor at the EU level, but can only be implemented internationally and in co-operation with other interested partners. This includes a better collaboration in development co-operation as well as international transparency initiatives and other measures to sustainably stabilise and to develop developing countries, which are rich in raw materials, as part of a global resource management. In this context, so-called national raw materials funds for developing countries rich in raw materials (e.g. Central Africa) are included. Important criteria for the success of these funds is an independent management, also to make efficient public control possible, the transparency of income and expenditure to oppose corruption, as well as the appropriation of the income for sustainable development. Since many states are too weak to build up and operate raw materials funds along these criteria, they should be supported in this undertaking by international organisations (e.g. by a sub-organisation of the UN or the World Bank).

The creation of transparency regarding cash flows is an important instrument to fight against corruption and for Good Governance. The most important transparency initiative, which was agreed on under the British G8-Presidency, was the "Extractive Industries Transparency Initiative" (EITI). At the core, this initiative says that cash flows to public institutions in the area of raw materials extraction, as licence tax or permission costs, have to be disclosed by companies. By now, EITI runs a secretariat in Oslo and numerous states have now joined the initiative. The initiative "Publish What You Pay" strives for similar goals, and the "Global

Reporting Initiative" aims at publishing environmental and social data.

The "International Council on Mining and Metals" (ICMM) has created ten sustainable standard principles for its member companies – a first important step to the creation and implementation of environmental and social standards. In addition to the Kimberley-certification process for diamonds, which has been in existence for quite a long time, an initiative for the certification of trade chains in the raw materials sector has been introduced by Germany. The German Federal Institute for Geology and Natural Resources has worked out a concept how trade routes of high-tech and precious metals such as tantalum, wolfram, tin and gold, especially from manual (artisanal) small-business mining could be controlled and certified. Raw materials illegally extracted and traded can be identified by geochemical "finger prints", which are characteristic of each ore. At the same time, the concept shows how the journey of raw materials from local producers to industrial purchasers, being based on international environment and social standards, can be certified.

The information on raw materials and their usage stems from completely different sources. The establishment of an international institution for market monitoring could solve the problem and provide edited information to mining groups as well as to industries with a demand for raw materials. Information exchange between these industry players should result in a better co-ordinated raw materials supply and demand and in the reduction of the risk-carrying and therefore cost-producing volatility at raw materials markets.

Outlook

Raw materials security is no end in itself, but a decisive prerequisite for the industry's competitiveness and therefore for wealth, growth and employment in Europe. Nobody is able to predict future developments of the raw materials markets. Nevertheless, the detailed analysis of the driving factors and the creation of transparency on fundamental market data allow identifying resilient development trends. This trend goes towards an overall increasing raw materials demand. The price decline in the course of the global financial and economic crisis has not changed anything about the basic importance of reducing our raw materials dependency and to strive for a sustainable security of our raw materials imports. This also makes the gradual development of a Global-Governance-System for resource management more urgent which is related to the self-interests of companies and states and also to the listed international initiatives.

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THEMEN

The Fight against Corruption, Industrial Espionage and Economic Crime

Corruption

Current estimates place the cost of bribes paid to gain business advantage at US$ 1 trillion annually; the embezzlement of public funds or theft of public assets by corrupt officials is unquantifiable. The World Bank also estimates that tainted procurement amounts to US$ 1.5 trillion, with an unquantified volume of fraud in the private sector. The result of this development is a reduction of Foreign Direct Investment, reduced growth rates and a significant reduction of tax revenues with a consequent reduction in state spending on infrastructure and public services. The cost associated with corrupt practices is not only a financial cost – the reputational damage to companies which have been associated with corrupt practices, such as Siemens, continue to dominate the press.

The scale of global corruption shows no sign of abating. Companies readily engage in corrupt practices to maintain market position and share. Transparency International has highlighted that it is companies from emerging market economies such as Russia, China, India and Brazil that are more prone to pay bribes in return for contracts, with clear implications for Western companies where corruption controls are significantly higher and more effective. Some argue, incorrectly, that they can only compete against such companies by behaving in a similar manner.

International initiatives to combat corruption continue to struggle. Such initiatives include the UN Convention against Corruption, the OECD Convention on Combating Bribery and the US Foreign Corrupt Practices Act. Despite this, awareness levels remain low with many companies, including those in the OECD, unaware of the legislation or unwilling to implement measures to combat corruption. It can however be assumed that awareness will grow as the implications of non compliance with such initiatives become more apparent. Global media coverage has made companies increasingly sensitive of the needs to protect their reputations worldwide and has also lead to growing public awareness of the cost of non compliance. The key challenge for companies will be that they can no longer operate by one set of standards at home and by another abroad. However, companies will find it increasingly difficult to compete given that rivals from less well regulated and controlled jurisdictions will continue to play by different rules. As a consequence it can be expected that Western companies will revert to "name and shame" tactics in order to overturn commercial decisions which have been taken due to

corrupt practices. Greater awareness of the economic costs of corruption and associated social costs will boost reform agendas at a national and international level. It will also mean that companies will have to invest increasingly in programmes to fight corrupt practices within their own companies in order to avoid damaging their reputation and in order to be sought after as a reliable and clean business partner. Companies not adhering to compliance guidelines will in future no longer be asked to tender for contracts by an increasingly number of governments, international organisations and private companies.

Of all the measures the Foreign Corrupt Practices Act (FCPA), which governs all US-listed companies and their overseas subsidiaries, is currently the most actively enforced and implemented anti-corruption instrument. The emphasis is on US companies (and foreign companies listed in the US), but cases against foreign companies have increased, underlining the extraterritorial reach of the FCPA. Besides making it unlawful for any US-listed company to make or offer a payment to a foreign official to influence that official to assist in obtaining or retaining business, it also requires companies to maintain an adequate system of internal controls. The recent decision of the US government to impose a fine of $ 400 Million on the British arms giant BAE for knowingly and wilfully impeding the US authorities by making certain false, inaccurate and incomplete statements in relation to compliance with anti corruption standards, thus defrauding the US, is a milestone in the fight against corrupt practices and bribery of foreign officials in order to win contracts. BAE was also fined around $ 47 Million in the UK for withholding information in relation to a deal in Tanzania. As a result of these payments, and for having admitted to wrong doings, BAE is not to be disbarred from tendering for defence work in the US and UK, but the monetary and reputational cost was and remains significant.

European companies are slowly waking up to the fact that they still have a long way to go in building up internal controls to both prevent corrupt practices and satisfy regulators and Governments. The screening of future employees (pre-employment screening) is rudimentary at best in many companies and the "know your customer" approach adopted by Anglo-Saxon companies is considered by some to be an attack on the privacy laws. Pre employment screening is frowned upon as it is considered to be too intrusive. As corrupt practices are conducted by employees it makes sense to investigate the past of future employees in order to weed out those with a corrupt past or tendencies to turn a blind eye to illegal behaviour. Data protection laws will have to be looked at very carefully in the future in order to ensure that legislation does not aid the criminal.

The way forward is going to be very varied with many countries increasing their anti corruption efforts in order to attract foreign investors. Many others, however, will continue in a "business as usual" mode, not least because many emerging markets have benefited from high investment flows even where they are known to have high levels of corruption. Resource-rich African countries are reluctant to embrace anti corruption measures given that they are wooed by countries such as China which is known to turn a blind eye to corrupt practices, providing the resources continue to flow. Such practices do little to combat corrupt business practices.

Economic and Industrial Espionage

Economic espionage has been around ever since nation states have existed and since there has been competition between nations and companies. The ancient Egyptians ran an intelligence service developed to gain information about their rivals, the Chinese attempted to protect the secret of porcelain, the method of production was, however, discovered by a French Jesuit and so reached Europe.

Today nations and companies spend a huge amount of money every year on trying to discover secrets their competitors attempt to protect. The overall economic cost of espionage cannot be calculated as the budgets for Intelligence Agencies who are the main practitioners of economic espionage, are a closely guarded secret. It is however known, that the Chinese Intelligence Services employ over one million people to both protect the country from within and unearth the secrets of others. The economic damage caused by the loss of information is also unquantifiable. The FBI estimates that economic espionage costs the US around 100 Billion $ per year, the German Ministry of the Interior estimates the damage to Germany at around 20 Billion EURO.

Industrial Espionage, unlike Economic espionage, is conducted by private companies. Aims and methods are similar; however government agencies have the advantage of being able to employ highly sophisticated technical means in order to gather information. Increasingly however, private organisations working for the private sector are using equipment and methods which only a few years ago would only have been used by intelligence agencies. The rapid increase in cyber attacks on companies is also due to the fact that unscrupulous "consultants" are now also using electronic means to gather confidential information, or are seeking to disrupt the systems of the competition in order to gain an advantage for their clients. Such cyber attacks on businesses can be expected to increase.

Companies are quite rightly investing significant sums of money in order to ensure that their EDP systems are as robust as possible in order to protect confidential information. The weakest link is however the employee and not the hard and soft ware. Security does not begin and end in the computer department, it is an issue which affects all departments within a company and is a top management issue. The firewalls and CCTV systems can be state

of the art, if however an employee is willing to pass on confidential information or reveal passwords, the best wall can be broached with relative ease.

Shady consultants and foreign agents are well schooled in the art of social engineering. This process, which can take time, is designed to ensure that a target is sufficiently manipulated to reveal the secrets of a company. This can take the form of creating friendship, usually by providing a life style the victim could otherwise not afford. In the first instance information of little real value is asked for, gradually the stakes are raised until the informant is so deep into the role of informant that he cannot escape. At this point the real information the agent is seeing is requested, accompanied by the threat of revealing what has taken place should the information not be handed over. Most persons in such a position hand over the information. The outcome for the informant is not very bright. If the person is a low level employee, recruited to get hold of one specific piece of information, they will be discarded. Only sources at a decision making position might be retained and further induced to reveal information.

Open Source Intelligence (OSINT) is frequently used both to gather information on companies but also on people who might be targeted as a source. There is a huge amount of information in the Web and in publications. This can be further refined by legal visits to companies, seminars, trade fairs and social gatherings. The latter has the advantage of combining both social engineering methods and the gathering of information. Whilst OSINT will not replace Human Intelligence (HUMINT), the rapid growth of freely available information and computer programmes which allow analysts to rapidly sift through gigabytes of electronic information has increased the vulnerability of companies. The willingness of people to provide private information on such sites as Facebook is alarming as it offers those who seek to target weak links in companies an easy way to identify likely candidates.

A recent penetration test in the US gives a good example of how OSINT and HUMINT methods can result in the loss of information. A High-Tec company asked a security consultant to test the defences the company had constructed to counter the loss of information. The consultants, using OSINT methods, managed to place a part time employee in the company using a false name and a fictitious background. By using social engineering skills this person was able to gain access to top secret information relating to the configuration of the fire wall and also to pass words. This information was passed on to external hackers who were able to gather sensitive information which, if it had been passed on to competitors, would have resulted in a loss to the company of around 1 Billion$. The company had built up a robust defence from attacks from outside; it had simply forgotten that the enemy can also come from within.

Given that many companies are networked and expect their senior management to be electronically reachable at all times, the dangers of loosing information are greater outside the office rather than within. The use of hand held devices or lap top computers when on a business trip represent a major threat to the security of data. Computers or other electronic devices left in bed rooms or in meeting rooms can be compromised and land line calls as well as calls on mobile phones intercepted. Such threats are barely recognised and many executives endanger their company by not sticking to simple precautions. One should simply assume that all information carried with one in electronic form can be accessed and should avoid if at all possible taking any such information on a business trip and leaving it unguarded.

A further threat is blackmail – many a piece of hot information has come out of entering into a compromising position far from the marriage bed.

Economic Crime

Some 45% of all companies fall victim of some form of economic crime, according to international consultancy KPMG. Large companies report an average of 12 incidences per year; many incidences remain unreported as companies do not want the general public to be aware of the problem. Retailers, affected by numerous low value losses even factor the economic cost of theft into their pricing structure.

IP theft and counterfeiting also show no sign of abating. The global trade in illicit goods is increasing: the number of counterfeits has grown at eight times the speed of legitimate trade according to Interpol, resulting in global commercial losses in the region of 500 Billion $, equal to around 7% of world trade and is largely built around the same global complex distribution chains associated with legitimate trade flows. Organised crime has built increasingly dense infrastructures to smuggle goods such as cigarettes, alcohol and drugs.

Such groups are becoming increasingly sophisticated through international links, the use of legitimate business structures and violence. They will become increasingly entrenched through growing influence (via corruption) and their associated level of social and economic infiltration and integration. In some countries, such as Angola or Russia, organised crime can account for up to half the national economy.

These networks conduct criminal activities varying in structure, length and complexity, but most groups will continue to possess a core membership around which there is a cluster of subordinates, specialists and transient members with a network of dispensable associates or low level criminals used to carry out logistical and criminally related tasks. Such groups use a risk based approach to activities by threatening violence in the case of betrayal and by transferring risks to lower level criminals or using specialists on a need only basis. As a result of the latter, we now have highly spe-

cialised criminal service organisations offering quality services in the field of IT, finance, forgery or logistics. Such specialists offer criminal organisations the possibility of cyber attacks rather than old fashioned robbery and furthermore the possibility of using the Internet to launder the proceeds of their illegal activities. Economic crime has both gone global and increasingly electronic.

Many observers believe that the links between transnational organised crime and political violence will continue to grow. There have been or are numerous examples of armed groups resorting to smuggling to finance their violence: narcotics have been smuggled by the Kosovo Liberation Army, the Kurdish workers Party. The Islamic Movement of Uzbekistan the Taliban and the Irish Republican Army. Thus organised crime will increasingly corrupt and undermine effective governance from the local to the state level and in some cases replace the legal government. The list of countries considered to be failed states or failing states is growing in Africa but also in Latin America, Asia and the Middle East. The problem of this development is more dangerous than is generally understood. The human security implications of state failure include armed conflict, famine, disease outbreaks, mass migration and an acceptance of organised crime. Such an environment is hardly one companies would like to do business in, certainly not without taking robust measures to mitigate the associated risks involved.

Conclusion and Recommendations

Whilst globalisation has acted as a facilitator of growth, it also serves to increase susceptibility to risk through interconnectedness between business, markets, people and nations. At the same time, the pace of change has increased dramatically, meaning that the consequences of a risk event may become wider and more immediately felt by companies than previously envisioned.

As threats manifest, they will have a widespread impact on business activities through the interplay of multiple factors. The loss of information to a competitor has an impact of the financial performance of a company and also is damaging to the reputation, which in turn can result in a declining share price. For the board of such a company the implications can be serious if it is shown that the company had not taken the necessary steps to protect the company from the loss of information. Thus the loss of information becomes a compliance issue with all the consequences for those responsible at board level. An incidence of corruption within a company can in the same way damage the company financially and have compliance consequences for the board if it can be proven that due care to avoid such incidences had not been taken. It can furthermore result in companies who have tolerated corrupt practices from being barred from tendering for contracts in certain countries or for international organisations. Siemens, for example, was not allowed to bid for a contract for a mass urban transportation system in San Diego following the recent investigation into corrupt practices in relation to bribe paying in return for contracts.

At the root of the problem is not an exogenous factor such as a pandemic or breakdown in infrastructure or even a natural disaster. Such risks are outside the control of companies and organisations can prepare for such an event in order to mitigate the impact on the company. The main risk is the employee who, for whatever reason, is induced to act in a manner which is criminal and thus damages both the reputation of the company and causes economic damage. The enemy might be outside the company but the way into the company requires inside help. Companies can protect themselves from exogenous threats such as electronic monitoring, tapping of phone calls or from burglary by using technical means. Such measures, however, do not protect companies from being exploited by employees.

Senior executives or owners of companies are reluctant to believe that employees can be disloyal. In investigations of such cases one often hears that “we don’t have that kind of problem”. Alas, that is not the case and as in society any company also has its share of individuals prone to take rules and regulations lightly. Companies need to become aware of this and need to screen those in positions of responsibility closely prior to them joining the company. Such pre employment screening is commonplace in many Anglo Saxon companies, but in continental European countries screening is the exception rather than the rule. The monitoring of persons on a regular basis once they have joined the company is one fraught with problems in countries with high levels of personal data protection. However, controls need to be introduced in accordance with local laws in order to keep up the pressure on employees to perform to agreed guidelines. Such measures also include job rotation in the purchasing departments in order to prevent the creation of corrupt networks or the practice of two or more employees signing off on contracts. At the same time companies need to screen their business partners on a regular basis in order to prevent the company from doing business with corrupt partners.

Not all information can be protected, nor does it need to be. Companies therefore need to decide what information is confidential or secret and even top secret. Confidential information is normally the kind of information all employees can share. If such information is leaked to competitors the consequences are not usually damaging. A leak of confidential information can however result in later damages to the company as it could reveal avenues for a future attack. Examples of this are internal phone lists which could allow a hacker to impersonate an employee in the computer department and thus gain access to valuable data in internal data-

bases. There need to be clear rules about the circulation and destruction of such information and these rules need to be enforced. Secret and top secret information needs to be protected by restricting access to those who really need to know and by the establishment of clear paper trails in order to easily identify possible leaks rapidly. Rules on copying such information and on encryption need to be established. Any hard copy of such information needs be held in a secure place and shredded rather than disposed in locked containers for shredding by external service providers. It should be remembered that the easiest way of gathering data is by examining the waste a company generates, it is known as "dumpster diving".

Such measures will make it more difficult for competitors or even foreign intelligence agencies to gain access to company secrets. However the main weakness remains the employee who is willing to break and circumnavigate such rules. Besides ensuring that no clearly rotten apples are employed by screening candidates in advance and on a regular basis, the real key to fighting information loss and any criminal activity within a company is by laying down clear rules and communicating such rules. Employees need to understand why such rules are enforced and what the consequences are if these rules are broken. There has to be a clear zero tolerance policy for those breaking the rules which is enforced from the top down as rigorously as it is from bottom up. Many companies have such programmes, most of them are however not effective as they tend to be computer based multiple choice questionnaires which are seen as a necessary evil. In some cases employees are required to sign off on the rules governing information protection and other compliance issues, more often enough such declarations are signed without understanding why the rules have been drawn up. More effective are regular face to face workshops where senior management explain in detail the reasons behind such rules and the consequences of not living these rules. If this is done professionally and often enough then such measures, combined with other security measures, will result in a high degree of protection from criminal behaviour in the company and a higher degree of business protection.

The risks companies face have increased significantly in the past years due to globalisation and the advent of the internet and networked systems. Risk levels are likely to increase and new risks will emerge in the future. At the same time national and international law is requiring companies to run their operations in a manner compliant with such laws. Increasingly, companies are being investigated for infringing and breaking such laws, with significant financial and reputational consequences.

The fight against corruption, industrial and economic espionage and other economic crime is as much a battle against those wishing to attack your company as it is a fight for the hearts and minds of the employees.

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THEMEN

Cruise-Missile-Threat

Die gegenwärtige sicherheitspolitische Debatte wird durch die atomaren Aufrüstungsbestrebungen des Irans dominiert. Während sich sowohl Pressemeldungen als auch die offiziellen Berichterstattungen auf die Bemühungen Teherans zur Anreicherung nuklearen Materials konzentrieren, finden die iranischen Programme zur Herstellung neuer Trägersysteme vergleichsweise geringe Beachtung.

Bei detaillierter Betrachtung des im Februar 2010 vom US-Verteidigungsminister Robert Gates veröffentlichten *Quadrennial Defense Review Reports* wird jedoch die von der Entwicklung neuer ballistischer Trägersysteme ausgehende Gefährdung der internationalen Sicherheit betont und in einem zeitgleich erschienenen Bericht – *Ballistic Missile Defense Review Report* – eingehend analysiert.[1]

Selbst angesichts dieser detaillierten Studien scheint jedoch zur Gewinnung einer umfassenden Bedrohungsperzeption eine Ergänzung um einen weiteren Aspekt erforderlich. In einer im Dezember 2009 veröffentlichten Analyse des *Institute for Near East & Gulf Military Analysis (INEGMA)* wurden die Proliferationstendenzen von Cruise Missiles in der Region des Mittleren Ostens thematisiert. Nachdrücklich wird festgestellt, dass die Proliferation und Weiterentwicklung von Cruise Missiles – hierbei handelt es sich um land-, luft- oder seegestützte Flugkörper, die über einen eigenen Antrieb verfügen und sich auf einer aerodynamischen stabilisierten Flugbahn bewegen – aufgrund ihrer schweren Bekämpfbarkeit, hohen Treffergenauigkeit, großen Reichweite sowie vergleichsweise geringen Anschaffungskosten eine zu-

[1] http://www.defense.gov/QDR/ und http://www.defense.gov/bmdr/

nehmend wachsende Herausforderung darstellen werden.[2]

Die von Cruise Missiles ausgehende Gefahr ist jedoch keineswegs neu. Bereits seit mehr als zehn Jahren weist Dennis Gormley, Professor am Monterey Institut für Internationale Studien in Kalifornien, auf die weithin unterschätzte Bedrohung hin.[3] In seiner 2008 veröffentlichten Analyse *„Missile Contagion. Cruise Missile Proliferation and the Threat to International Security"*[4] beschreibt er eindringlich eine globale Herausforderung, die – stetig wachsend – bereits heute eine Bedrohung der internationalen Sicherheit darstellt.

Staatliche Akteure
Land-attack cruise missile

War Israel in der Vergangenheit das einzige Land des Nahen und Mittleren Ostens, das über hochpräzise und weitreichende Cruise Missiles verfügte, entwickelt auch der Iran Programme zur Herstellung und Weiterentwicklung von Lenkflugkörpern.[5] Auch in Ländern wie China, Indien und Pakistan ist eine verstärkte Nachfrage sowohl am Besitz als auch an der Produktion weitreichend operierender, tiefffliegender Cruise Missiles festzustellen.[6]

Insbesondere die Entwicklung von „sophisticated cruise missiles", so beispielsweise die im Überschall operierende indisch-russische Koproduktion BrahMos, die Implementierung von Stealth Eigenschaften, elektronischen Täusch- und Gegenmaßnahmen sowie die immense Reichweitensteigerung bei gleichzeitigem Tiefstflug müssen hierbei als vorherrschende Innovationstendenzen genannt werden.[7] Ein weiteres Argument für die wachsende Nachfrage ist zweifelsohne die Präzision moderner Land-attack Cruise Missiles (LACMs).[8]

Die Navigation einer LACM lässt sich in drei Phasen unterteilen: Insgesamt ermöglicht die Nutzung eines Inertial Navigation System (INS) in der Startphase, ein radarbasiertes „terrain contour matching" (TERCOM) in Kombination mit Satellitennavigationssystemen GPS oder GLONASS[9] in der Midcourse Phase sowie die Verwendung eines optischen oder radarbasierten Sensors in der Endanflugsphase eine punktgenaue Steuerung fortschrittlicher LACMs.[10]

Während somit konventionelle LACMs als eine überaus ernstzunehmende Bedrohung betrachtet werden müssen, gilt es überdies zu betonen, dass Marschflugkörper auch als Träger von Massenvernichtungswaffen eingesetzt werden können.[11] In der Einschätzung Oliver Thränerts von der Stiftung Wissenschaft und Politik eignen sich Cruise Missiles „besonders gut für die Ausbringung chemischer und biologischer Kampfstoffe", da bei dem Einschlag nicht wie bei einer ballistischen Rakete hohe Temperaturen entstehen, die die Wirkung von Kampfmitteln beeinträchtigen können.[12]

LACMs müssen aufgrund dieser Parameter zweifelsohne als komplexe Waffensysteme wahrgenommen werden, die vorrangig in nationalstaatlichen Armeen jener Staaten zu erwarten sind, die parallel Programme zur Entwicklung ballistischer Trägersysteme vorantreiben.

Anti-ship cruise missiles

Cruise Missiles zählen im Unterschied zu weitreichenden ballistischen Flugkörpern jedoch nicht zwingend zu „Hightech"-Waffensystemen, da zwischen komplexen LACMs (Land-attack cruise missile) und zumeist einfacheren ASCMs (Anti-ship cruise missiles) mit geringer Zielgenauigkeit und Reichweite unterschieden werden muss.

In diesem Zusammenhang muss einschränkend betont werden, dass sich dieser Beitrag ausschließlich auf die für den Einsatz gegen Landziele modifizierten ASCMs konzentriert und die durch Lenkflugkörper für die Marinekräfte ausgehende Bedrohung unberücksichtigt bleibt. Angesichts einer von amerikanischen Studien prognostizierten Gesamtzahl von weltweit 80.000 Marschflugkörpern muss zudem berücksichtigt werden, dass lediglich ein geringer Prozentsatz auf LACMs und hochentwickelte ASCMs entfällt.[13] Vielmehr ist auch zukünftig eine weitere Verbreitung der bereits gegenwärtig überaus zahlreich vorhandenen ASCMs primitiverer Bauart zu erwarten. Hierbei lässt gerade die Modi-

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[2] Khalid Abdullah Al Bu-Ainnain: Proliferations Assessment of Cruise Missiles in the Middle East, in: Institute for Near East & Gulf Military Analysis (INEGMA), Special Report Nr. 3, Dezember 2009, S. 1. http://www.inegma.com/?navigation=reports&page=2#

[3] Gormley, Dennis M.: Hedging against the Cruise-Missile Threat, in: Survival, Vol. 40, Nr. 1, 1998, S. 92 – 111.

[4] Gormley, Dennis M.: Missile Contagion. Cruise Missile Proliferation and the Threat to International Security, Westport 2008.

[5] Zur detaillierten Information über iranische Cruise-Missile-Programme: INEGMA, Special Report Nr. 3, S. 13.

[6] INEGMA, Special Report Nr. 3, S. 12 / Butler, Amy: Low, Slow and Stealthy, in: Aviation Week & Space Technology, Juni 2006, S. 48 – 54, S. 48.

[7] Gormley, Hedging against the Cruise-Missile Threat, S. 106. / Jackson, Brian A., David R. Frelinger, Michael J. Lostumba und Robert W. Button: Evaluating Novel Threats To The Homeland. UAVs and Cruise Missiles, National Defense Research Institut RAND, 2008, S. 99. http://www.rand.org/pubs/monographs/2008/RAND_MG626.pdf

[8] Schmidt, Oliver: Iranische Raketen und Marschflugkörper, Diskussionspapier SWP, Dezember 2006, S. 9. http://www.swp-berlin.org/common/get_document.php?asset_id=3531

[9] Aufgrund des universellen Zugangs zu Daten der Satellitennavigation – entweder des US Global Positioning System (GPS) oder des russischen Systems GLONASS (Global Navigation Satellite System) – erhalten Marschflugkörper eine überaus höhe Zielgenauigkeit.

[10] National Air and Space Intelligence Center. Wright-Patterson air force base (NASIC): Ballistic and Cruise Missile Threat, April 2009, S. 26. http://www.fas.org/programs/ssp/nukes/NASIC2009.pdf / INEGMA, Special Report Nr. 3, S. 8 f.

[11] Gormley, Missile Contagion, S. 148.

[12] Thränert, Oliver: Die Verbreitung von Raketen und Marschflugkörpern. Stand – Tendenzen – Gegenmaßnahmen, Studie der Stiftung Wissenschaft und Politik, Berlin, Juli 2005, S. 11.

[13] Gormley, Dennis M.: New Developments in Unmanned Air Vehicles and Land-Attack Cruise Missiles", in: SIPRI Yearbook 2003, S. 409 – 432. / INEGMA, Special Report Nr. 3, S. 2.

fikation von Antischiffssystemen für den Einsatz gegen Landziele eine strikte Unterscheidung zwischen ASCM und LACM zunehmend fragwürdig erscheinen.

Der US-Sicherheitsexperte Thomas G. Mahnken kommt auf Grundlage aktueller Analysen des US-Verteidigungsministeriums zu der Einschätzung, dass lediglich für einen Betrag von 50 Millionen Dollar mehr als 100 ASCMs beschaffbar seien.[14] Neben diesen vergleichsweise geringen Anschaffungskosten muss auf das niedrige technische Know-how hingewiesen werden, welches zur Weiterentwicklung dieser wenig komplexen Cruise Missiles geringer Reichweite erforderlich ist.[15] Bei ausschließlicher Verwendung von auf dem kommerziellen Markt verfügbarer Technik lässt sich bei einer chinesischen Anti-Schiffsrakete vom Typ Silkworm sowohl eine Steigerung der Reichweite von 100 auf 1.000 km als auch eine Modifikation zu einer LACM herstellen.[16] Da nahezu sämtliche Bauteile aus der zivilen Luftfahrt adaptiert werden können, ist der Zugang zu den erforderlichen Komponenten einfacher, preisgünstiger und schwerer kontrollierbar. Hierin sieht Oliver Schmidt von der *Stiftung Wissenschaft und Politik* den Hauptgrund der zunehmenden Verbreitung. Bereits der Austausch eines leistungsschwächeren Turbo-Jets durch einen Turbo-Fan-Antrieb garantiert bei gleichem Gewicht und geringerem Treibstoffverbrauch eine deutliche Reichweiten- und Schubleistungssteigerung.[17]

Neben den geringen Beschaffungs- und Weiterentwicklungskosten trägt die „möglichst gesicherte Überwindung gegnerischer Luftabwehr“ zu einem Anstieg der Nachfrage nach Cruise Missiles bei.[18] So wurden im Rahmen der Operation Iraqi Freedom 2003 alle insgesamt neun abgefeuerten ballistischen Trägersysteme vom Typ SCUD erfolgreich bekämpft, während sich der Einsatz von fünf Cruise Missiles bei der Überwindung der amerikanischen Luftverteidigung als überaus erfolgreich erwies. Eine der eingesetzten Cruise Missiles vom Typ HY-2 landete am 29. März 2003 unweit des Hauptquartiers des U.S. Marine Corps in Kuwait.[19] In einem CNN-Interview nach dem Einschlag äußerte sich der kuwaitische Informationsminister eindeutig: „This kind of missile usually flies between 20-25 meters over the land. For that, there is no defence system that can reach it.“[20]

Da selbst Crusie Missiles einfachster Bauart nachweisbar die amerikanische Luftabwehr haben überwinden können, wird im Urteil Oliver Schmidts „die Anschaffung von Marschflugkörpern für Länder, die sich bisher auf die Entwicklung von ballistischen Raketen konzentriert haben, zunehmend attraktiver“[21]. In übereinstimmender Einschätzung wies Dennis M. Gormley auf das Bestreben zahlreicher „Third World countries“ hin, sich Waffensysteme dieser Art zu beschaffen.[22]

Nichtstaatliche Akteure in Szenarien des Hybrid Warfare

Thomas Bättig, Stabsoffizier der Schweizer Luftwaffe, legte im Oktober 2005 eine umfassende Analyse zur Cruise-Missile-Bedrohung vor, in der er betont, dass Marschflugkörper in „künftigen Konflikten stetig an Bedeutung gewinnen“ werden. Wenngleich er zu der Einschätzung gelangt, dass die Verbreitung von Cruise Missile mit „großer Wahrscheinlichkeit auf die Streitkräfte von Staaten“ beschränkt bleiben wird, gibt er abschließend zu bedenken, dass „die große Verbreitung der Anti-Ship Missiles und deren Verfügbarkeit auch für problematische Regimes“ die Möglichkeit offenlässt, dass „Terroristen in Besitz von solchen Lenkwaffen kommen können“.[23]

Nur wenige Monate nach Erscheinen dieser Analyse setzte die radikalislamische Hisbollah im Libanonkrieg 2006 eine iranische Variante der chinesischen HY-2 bei einem Angriff gegen ein israelisches Schnellboot ein, bei dem vier israelische Soldaten getötet wurden.[24] Unter der Überschrift „Hezbollah as Prototype“ griff Frank G. Hoffman, Professor am Potomac Institute for Policy Studies, die reale Dimension dieser Bedrohungsform in modernen Konfliktszenarien auf.[25] Der im wissenschaftlichen Diskurs entstandene Dualismus symmetrischer und asymmetrischer Kriege scheint nach dem Libanonkrieg 2006 nicht länger hinreichend. Wenngleich betont werden muss, dass auch in der Vergangenheit Konflikte nie in Reinform einer der beiden Kategorien zuordbar waren, muss die Verwendung von “sophisticated” Waffensystemen durch nichtstaatliche Akteure als

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[14] Mahnken, Thomas G.: The Cruise Missile Challenge, Center for Strategie and Budgetary Assessment (CSBA), März 2005, S. 33. http://www.csbaonline.org/4Publications/PubLibrary/R.20050310.CruiseMiss/R.20050310.CruiseMiss.pdf

[15] INEGMA, Special Report Nr. 3, S. 1.

[16] Gormley, Missile Contagion, S. 141.

[17] Schmidt, Iranische Raketen und Marschflugkörper, S. 8 und S. 10.

[18] Thränert, Die Verbreitung von Raketen und Marschflugkörpern, S. 20.

[19] Die im Irakkrieg 2003 von Cruise Missiles ausgehende Cruise-Missile-Gefahr und ihre unzureichende Abwehr sind eingehend beschrieben bei: Gormley, Dennis M.: Missile Defence Myopia: Lessons from the Iraq War, in: Survival 45, Winter 2003 – 2004, S. 61 – 86. / Butler, Low, Slow and Stealthy, S. 51.

[20] zit. nach: Lawes, Inger S. : Defence Against Terrorism – A Role for Ground Based Air Defence, in: Land Warfare Conference 2007. / www4.janeS. com/k2/doc.jsp/content1/janesdata/mags/jmr/jrm00756.htm

[21] Schmidt, Iranische Raketen und Marschflugkörper, S. 9.

[22] Gormley, Missile Contagion, S. 139.

[23] Bättig, Thomas S.: Marschflugkörper. Kategorien, Technologie, Leistungsfähigkeiten, Proliferation, Bedrohung, Abwehr, in: Air Power Revue der Luftwaffe Nr. 4, Beilage zur ASMZ 10/2005, S. 5 – 19, S. 13 f. http://www.lw.admin.ch/internet/luftwaffe/de/home/die_luftwaffe/organisation/luftwaffenstab/doctrine/downloads.parsys.0015.downloadList.00151.DownloadFile.tmp/airpowerrevueno04200510.pdf

[24] Gormley, Missile Contagion, S. 138. / Jackson, Evaluating Novel Threats To The Homeland, S. 2 und S. 14. / Hilburn, Matt: Hezbollah´s Missile Surprise, Today in the Military, 28. September 2006. www.military.com/forums/0,15240,115199,00.html

[25] Hoffman, Frank G.: Conflict in the 21st Century. The Rise of Hybrid Wars, Potomac Institute for Policy Studies, Dezember 2007, S. 35 f. http://www.popmacinstitute.org/publications/Potomac_HybridWar_0108.pdf.

ein neu zu betrachtendes Phänomen verstanden werden.[26] Diese als „Hybrid Warfare" bezeichneten Konfliktszenarien verbinden – wie Frank G. Hoffman formuliert – „the lethality of state conflict with the fanatical and protracted fervor of irregular warfare"[27].

Insbesondere der terroristische Einsatz von Cruise Missiles von zivilen Containerschiffen muss hierbei als kaum zu bewältigende Herausforderung gelten. In einer Pentagon-Untersuchung vom August 2006 wird in diesem Zusammenhang ausdrücklich auf die Möglichkeit einer direkten Bedrohung der US-Küstenstädte hingewiesen.[28] Auch daher beurteilte Gormley die von modifizierten ASCM ausgehende Gefahr als „unwanted dilemma for American missile defense"[29].

Notwendige Antworten

Handlungsoption 1: Cruise-Missile-Defense

Die wirkungsvolle Bekämpfung gegnerischer Cruise Missiles ist eine klassische Aufgabe der bodengebundenen Luftverteidigung.[30] Hierbei muss jedoch betont werden, dass eine erfolgreiche Cruise-Missile-Defense einer vielschichtigen Antwort bedarf. Erst das geplante Luftverteidigungssystem MEADS sowie die Beschaffung des Lenkflugkörpermixes aus PAC-3 und dem Zweitflugkörper IRIS-T SL wird ein nahezu allumfassendes Wirkspektrum gegen Bedrohungen aus der Luft gewährleisten, seien es Cruise Missiles, bemannte oder unbemannte Luftfahrzeuge oder ballistische Flugkörper.

Bei MEADS muss, wie bei jedem System der bodengebundenen Luftverteidigung, zwischen zwei wesentlichen Komponenten unterschieden werden. So dienen die Sensoren der Erfassung und Verfolgung von Flugzielen, während die Kampfmittel (Effektoren) den gegnerischen Flugkörper neutralisieren sollen. Aufgrund ihres erdnahen Flugprofils muss insbesondere die Erfassung anfliegender Cruise Missiles als besondere Herausforderung gekennzeichnet werden, denen MEADS dank seiner offenen, vernetzten Systemarchitektur („plug-and-fight"-Fähigkeit) wirkungsvoll begegnen wird, da hier zusätzliche Sensoren und Effektoren integriert werden können.

Handlungsoption 2: Proliferationsbekämpfung

Neben einer innovativen Cruise-Missile-Defense müssen vor allem Maßnahmen einer erfolgreichen Nichtverbreitungspolitik intensiviert werden. Basis eines internationalen Vorgehens ist das bereits 1987 durch die führenden Industrienationen der G 7 gegründete Missile Technology Control Regime (MTCR), dem bis heute 34 Nationen beigetreten sind.[31] Neben der Tatsache, dass das MTCR jedoch nicht auf einem international rechtsverbindlichen Vertragswerk fußt, muss vor allem die Fixierung auf Cruise Missiles großer Reichweiten überwunden werden.[32] So verfolgt das MTCR lediglich das Ziel, die Proliferation von Raketen, Unmanned Aerial Vehicles (UAVs) und vergleichbarer Technologien zu verhindern, falls Waffensysteme einen Gefechtskopf von 500 Kilogramm über eine Distanz von mehr als 300 Kilometern transportieren können.[33] Angesichts des aufgezeigten Bedrohungspotenzials ist offensichtlich, dass diese Festlegung als wenig sinnvoll bewertet werden muss, da eine Reichweitensteigerung mit geringem technischem Aufwand oder unter Nutzung ziviler Trägerplattformen, beispielsweise durch zivile Containerschiffe in Küstennähe, erreicht werden kann.[34]

Zentrale Forderung: Bedrohungswahrnehmung

In kommenden Einsatzszenarien ist ein realer und zunehmender Cruise-Missile-Threat zu berücksichtigen, wobei selbst ein vergleichsweise primitiver Marschflugkörper mit geringer Zuladekapazität bei einem gezielten Einsatz verheerende Effekte erzielen kann.

Vorrangiges Ziel muss deshalb sein, die komplementäre Bedrohung von ballistischen Raketen und Cruise Missiles zu erkennen und zudem die spezifischen Aspekte des komplexen „Cruise Missile Threats" zu diskutieren, wobei vor allem zwischen hochentwickelten LACM, modifizierten ASCM sowie durch nichtstaatliche Gruppierungen zum Einsatz gebrachte Lenkflugkörper einfachster Bauart zu unterscheiden ist.

Angesichts der Nutzung eines vergleichsweise komplexen Waffensystems durch die Hisbollah muss berücksichtigt werden, dass der Einsatz von Cruise Missiles nicht nur in militärischen Auseinandersetzungen zwischen hochtechnisierten Staaten, sondern auch in asymmetrischen Konflikten möglich ist. Insgesamt muss daher die Wahrnehmung der von Cruise Missile ausgehenden vielschichtigen Be-

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[26] Hoffman, Frank G.: Hybrid Warfare and Challenges, in: Joint Force Quarterly, Ausgabe 52, 2009, S. 34 – 39, S. 36. http://www.potomacinstitute.org/media/mediaclips/2009/Hoffman_JFQ_109.pdf / Wilkie, Robert: Hybrid Warfare. Something old, not something new, in: Air and Space Power Journal, Winter 2009, Vol. XXIII, Nr. 4, S. 13 – 17, S. 14.

[27] Gates, Robert M.: A Balanced Strategy, in: Foreign Affairs, Januar/ Februar 2009, S. 28 – 40, S. 34. / "Hybrid threats incorporate a full range of different modes of warfare including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder." Hoffman, Conflict in the 21st Century, S. 8.

[28] Heidenreich, John G.: Under the Radar Screen? The Cruise Missile Threat to the U.S. Homeland, in: comparative strategy 2004, vol. 23, no.1, S. 63 – 72, S. 64. / Liang, John: „Department of Defense Finds Cruise Missile Defense Gaps", InsideDefense.com NewsStand, 17. August 2006.

[29] Gormley, Dennis und Richard Speier: Controlling Unmanned Air VehicleS. New Challenges, März 2003, S. 3.

[30] Bättig, Marschflugkörper, S. 14.

[31] http://www.mtcr.info/english/index.html

[32] Cirincione, Joseph: MTCR. How effective is it?, Carnegie Nonproliferation Project, Mai 2001. www.carnegieendowment.org/events/?fa=eventDetail&id=324

[33] Gormley, Hedging against the Cruise-Missile Threat, S. 94.

[34] Baker, John C.: Under the radar?, in: Nonproliferation Review, Vol. 16, Nr. 1, März 2009, S. 119 – 123, S. 121. / Jackson, Evaluating Novel Threats To The Homeland, S. 5.

drohungen als wichtigste Konsequenz gelten, die der US-Sicherheitsexperte John Heidenreich mit einer prägnanten wie scharfsinnigen Feststellung zusammenfasste: „Ignoring the Threat will not make it go away."[35]

Dr. Marc Oprach, Hamburg

Dr. Marc Oprach ist Major der Luftwaffe und nimmt seit Oktober 2008 am Lehrgang Generalstabs-/Admiralstabsdienst National an der Führungsakademie der Bundeswehr teil. Dieser Artikel gibt die persönliche Auffassung des Autors wieder.

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Die **Denk*würdigkeiten*** erscheinen mehrfach jährlich nach den Veranstaltungen der **pmg**.

[35] Heidenreich, Under the Radar Screen, S. 70.