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Defence industry

Comprehensive sectoral analysis of emerging competences and economic activities in the European Union





European Commission

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Comprehensive sectoral analysis of emerging competences and economic activities in the European Union

Executive Summary

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The full study is available under the link http://ec.europa.eu/restructuringandjobs

European Commission

Directorate-General for Employment, Social Affairs and Equal Opportunities Unit F3

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Preface



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Education and training, in the context of a lifelong learning perspective, are an indispensable means for pro-

moting adaptability and employability, active citizenship, personal and professional fulfilment.

Investment in human capital through better education, and the development of skills and competences should be increased. It is important to anticipate skills needs — and also skills gaps — which are emerging in the European labour market, as well as to improve the matching of knowledge, skills and competences with the needs of society and the economy, as a means to increased competitiveness and growth, as well as to greater social cohesion, in Europe.

This is more important than ever in the current situation of crisis that will undoubtedly lead to substantial changes in economic activities in Europe coming years.

With this in mind, the Commission has elaborated a set of analysis of emerging competences in 18 sectors. Those analysis are available to all economic, social and professional organisations, educations and training institutions, etc. They can help them to refine their strategies and to engage into forwardlooking actions.

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Robert Verrue

Director-General, Employment, Social Affairs and Equal Opportunities DG

Aims and methodology

The renewed Lisbon strategy and European Employment strategy stress the need for Europe to place more emphasis on a better anticipation of skill needs together with the need to reduce labour markets mismatches. These policies aims also at minimising social costs and facilitating adaptation during restructuring processes through a better anticipation and positive management of change. Globalisation, technological change, climate change and demographic developments (including ageing and migration) in that respect pose huge challenges, comprising both risks and opportunities. In that context, the Commission has launched recently the New Skills for New Jobs initiative together with other related European projects aimed at identifying future job and skills needs using quantitative modelling approaches. While having advantages of robustness, stakeholders as well as the European Commission identified a clear need for complementary more qualitative forward-looking analysis. Consequently, the European Commission commissioned in 2007 a series of 18 future-oriented sector studies (horizon 2020) on skills and jobs following a uniform, qualitative methodology. Results of these studies have become available in summer 2009, and will be followed

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by a number of other initiatives over the oncoming year and beyond. The current economic crisis calls for the reinforcement of policies aimed at developing the employability of the workforce. This project fits within this policy objective.

18 sector studies, one methodology

The results of this study aim to serve as a guide in launching further EU and other actions to promote the strategic management of human resources and to foster stronger synergies between innovation, skills and jobs, taking into account the global context and encouraging adaptations to national and regional level.

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To validate, add and complement the findings of the project and to make sure that results are disseminated as broadly as possible across Europe, relevant stakeholders including European social partners, other services from the Commission with the expertise in the sectors analysed, representatives from the European Parliament, the European Economic and Social Committee, the Committee of the Regions, Eurofound and Cedefop were involved in the project from the beginning.

Aims and methodology

Sectors Covered
Automotive industry
Defence
Textiles, wearing apparel and leather products
Printing and publishing
Chemicals, pharmaceuticals, rubber and plastic products
Non-metallic materials (glass, cement, ceramic)
Electromechanical engineering
Computer, electronic and optical products
Building of ships and boats
Furniture and others
Electricity, gas, water & waste
Distribution, trade
Hotels, restaurants, catering and related services
Transport
Post and telecommunications
Financial services (bank, insurance and others)
Health and social work
Other services, maintenance and cleaning

A standard predefined methodology was developed by a panel of experts under the direction of Prof Maria João Rodrigues and applied to all 18 studies to ensure consistency and comparability of the results, the studies being produced by different contractors.

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Based on the basic methodological framework, each contractor executed 7 defined steps, starting with the mapping of main trends, key drivers of change, leading to scenarios of plausible evolution and their implication for employment at the year 2020 time horizon, the identification of implications for emerging competences and occupation profiles in terms of jobs expanding, transforming or declining, and their implications in terms of strategic choices and subsequent recommendations for companies, education and training systems, social partners and public authorities at all levels. This foresight methodology implies an approach combining desk research and expert knowledge.

At the end of each sector study a final European workshop for the sector was organised by the Commission to validate results as well as refine recommendations. In

addition to European Commission and Eurofound staff, about 20 experts per workshop from industry, academia and sector organisations including workers and employers' representatives with a sound knowledge of jobs and skills were invited to comment and provide recommendations to the report as part of the methodology.

Brief description of the methodological steps

Mapping

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The main purpose of this analysis was to provide factual background to identify key drivers used in the subsequent scenario development. Consequently, the Report analysed recent sector developments and trends and, at the same time, depicts the current state of play in the sector with an emphasis on innovation, skills and jobs. It was based on an analysis of available time series data and relevant existing studies. It analysed 1) structural characteristics (production, value added, employment in various dimensions, and related factors); 2) the value chain; 3) technological change and innovation; 4) trade and international competition as well as 5) regulation. The results

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of all sections were summarised in a SWOT analysis and were used as input to identify key drivers.

Drivers of change

On the basis of the mapping of the sector, a set of key drivers, sector specific or not, was identified. Literature review and expert knowledge of the sector were then used to define a conclusive list of sector-specific drivers. Drivers were classified as exogenous or endogenous depending on the ability for the sector's stakeholders and policymakers to influence them. These lists of drivers were also discussed in the experts' panel workshops.

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Qualitative scenarios and implications for employment trends

The set of selected sectoral drivers of change served as an input to develop scenarios for the evolution of the sector and implications for different occupations (composition of employment / emerging competences) in the period 2008 to 2020.

Implications of scenarios and emerging competences

Scenarios were built to assess the implications for the level (absolute

Aims and methodology

demand) and composition (relative demand compared to other job functions) of employment of different job functions by 2020. New and emergent skills required by different iob functions were identified based on the analysis of the evolution of past data on employment by occupation, on the analysis from the present situation and of experts' comments during the workshop. The focus was on identifying and describing key and critical competences for the future for each of the major occupational function in relation to the different scenarios elaborated. These formed the basis for the strategic choices identified in a next step.

Strategic choices for companies to meet emergent competence needs

Each sector study assessed possible strategic choices in terms of feasibility and actor involvement. The options comprised recruiting workers from other sectors, countries, recruiting graduates, re-training employed workers as well as changing work organisation.

Specific implications for education and training

Options to improve or to adapt education and training systems

were looked at in this step of the methodology, focussing more particularly on the specific role to be played by sectoral organisations, educational institutions and governments such as a stronger cooperation between stakeholders or an increased flexibility through modularisation of education and training.

Recommendations

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Each sector study contains specific recommendations to the sector. However, with the studies analysing Europe as a whole, the recommendations remain general and need a follow-up at the national and regional level. The intention of the project especially in the follow up phase is to use the results to stimulate stakeholders at lower territorial levels (national / regional) to work out results in more details, repeat and adapt this exercise to local needs rather than providing standardised solutions. Some general recommendations call for an intensified co-operation between relevant stakeholders, the need to invest strongly in human capital, more standardised requlations, enhanced VET to increase social mobility and coordinated National and European Vocational **Oualifications**.

The Defence sector – main characterisation

The European defence industry is a strategic sector of the EU economy, not only because of its contribution to EU security, but also because of its importance in terms of employment, value added and exports, because of its contribution to regional development, and because of its contribution to a number of other industries, notably through innovation.

Yet, today, the industry is facing important challenges: like other industrial sectors, the defence industry is required to deliver increased efficiency in order to provide value for money to its customers and, at the same time, protect its shareholders' interests. At the same time, demand is increasingly constrained by national defence budgets, whilst competition is growing at world level. Restructuring has become unavoidable. To minimise the negative consequences of restructuring in the social sphere, anticipation is essential - and in particular anticipation of skills needs

In that context, the objectives of the study were to:

 Identify and describe the challenges to which the EU defence industry is confronted;

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- Identify the regional distribution of defence activities, and the areas of employment concentration across the EU, in order to identify the areas most likely to be concerned by restructuring in this sector;
- Conduct a foresight exercise in order to identify and describe potential future trends in activity, by key segment of defence;
- Draw the main implications of the possible future development scenarios on employment: which jobs will be in high demand, which categories will decline in importance, which will change over the coming years, hence requiring changes in skills;

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- Identify and describe emergent job profiles, given future trends in product development and market organisational structure, and the associated training needs;
- Raise awareness of possible future employment trends amongst the defence industry' stakeholders, including in terms of emerging profiles and future skills needs;
- Provide the background information that is necessary to fuel

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discussions on how to improve strategic sector planning in education and training systems.

Overall context for defence industries

The defence industry is a key sector for the EU economy, not only because of its technological and economic policy aspects, but also because of the number of jobs dependent upon it. The sector covers a wide range of activities, such as the production of:

- Small arms and ammunition (snipers, rifles, ...), and artillery (light machine guns, mortars, automated grenade launchers, remote controlled weapon systems, man portable air defence systems, rocket launchers, etc.);
- Aircrafts, helicopters and Unmanned Aerial Vehicles (UAVs);
- Space equipment and services;
- Electronic equipment (reconnaissance, SIGINT, command & control,...);
- Engines and propulsion systems;
- Missiles;

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- Military vehicles (including command vehicles, main battle tanks (MBT), armoured fighting vehicles (AFV), infantry fighting vehicles (IFV), assault bridges and engineering vehicles...), and parts thereof;
- Naval vessels and warships (including battleships, amphibious assault ships, command and control ships, cruisers, destroyers, frigates, carriers, submarines, aircraft carriers, minesweepers, operational support ships, military sea lift ships, diving support vessels, patrol boats, navigation training vessels, range support vessels, etc.);
- Various types of services (maintenance, support, training, logistics, transport);
- Plus all the inputs (products and services) and equipments (machinery, buildings, infrastructure) that are used at some stage during the production process.

The defence industry is facing important challenges.

On the demand side

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The challenges are both European and global. At the European level,

these include the changing role of force, which leads to a new demand mix; stagnant, and in some cases declining, national defence budgets within the EU; shrinking national defence procurement; and, comparatively low spending on R&D. At the global level, the challenges are linked to the lack of dynamism of world market demand, and difficult market entry conditions for EU firms into the more dynamic world markets.

Over the past ten years, the value of procurement by the EU NATO members has, in fact, stagnated, whereas defence procurement markets in the US continued to grow at a rapid rate. Another source of concern is the fact that the FU countries' R&D spent is approximately one-sixth of the US R&D expenditure on defence. Furthermore, despite European efforts to improve coordination, internationalise procurement and encourage competition, the European Defence Market remains fragmented. Still less than one fifths of procurement is spent in collaboration projects in which at least two EU members participate, and Article 296 continues to be frequently invoked in order to justify derogations from Internal Market rules due to "essential security interests". This creates extra costs and inefficiencies, and has a

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negative impact on the competitiveness of Europe's Defence Industrial and Technological Base as well as on Member States' efforts to equip their armed forces adequately.

On the supply side

The key factors of influence are:

- the large variety, high technology and rapidly rising production cost of defence equipment and systems;
- (2) the dominance of (often national) champions that are highly dependent on trends in national procurement budgets;
- (3) the high dependence of certain regions on defence activities;
- (4) on-going transition in the newer member states;
- (5) past and future M & A patterns;
- (6) the growing concentration of the industry;
- (7) its particular ownership structure (with governments as major shareholder in France and Italy);
- (8) overall mixed experiences with cooperation.

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The juste retour principle in collaborative projects results in suboptimal procurement. Securing jobs at home is used to legitimize costinefficient procurement. Differences in arms exports complicate marketing. And, the management of cross border collaboration projects is cumbersome, which leads to cost and time overruns.

As a result of past mergers and acquisitions mainly along national lines, the leading producers offer equipment that is not necessarily standardised, since each country or producer pursues its own technology lines. Poor European cooperation also implies duplication of expenditures, misallocation of (scarce) public resources and the maintenance of excess capacities at EU level, whilst the national orientation of many firms prevents them from benefiting from economies of scale. Today, the FU Member States do not have the financial means to sustain the full spectrum of a defence technology industrial base. This means continued downward pressure on defence budgets (due to a preference for social welfare spending), and a continued downward trend in procurement budgets.

As a result of these factors, there are presently too many, too small,

companies to ensure the long term competitiveness of the European defence industry and the survival of all companies. Some European states are already turning to foreign countries to satisfy their munitions needs.

Although the creation of the Regime on Defence Procurement, the adoption of the EDTIB Strategy and the recently adopted EU defence package are important steps towards the creation of the European Defence Equipment Market (EDEM) and the strengthening of the European defence industry, a reorganisation of activities at European, national, and local levels is unavoidable. This is bound to have major consequences on employment, already severely impacted by past restructurings.

The sector is also key to the successful transformation and growth of a number of other industries: because defence markets cover a broad spectrum of products and services ranging from non-war material, such as office equipment, to complex weapon systems and highly sensitive material such as nuclear biological & chemical equipment, a large diversity of companies operate in, or work for, the sector. Among these are

material-producing companies (including composites), mechanical engineering, electrical and electronic producing companies, as well as companies involved in R&D,

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design, building and testing of prototypes, etc. In other words, the defence industry constitutes a key client and end-market for industrial and service sectors.

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R&T expenses

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Organisation of the supply chain: the defence industry's tier structure

In addition to its impact on other industries, on technological progress and on innovation, through its spill-over effects on innovation in civilian industries, the competitiveness of the European defence industry is vital to the credibility of the nascent European Security and Defence Policy.

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A particularity of the defence industries, however, compared to other industrial sectors such as agri-food or automotive, is that most firms involved actually produce dual use goods and technologies, i.e. products and technologies which have both civilian and military applications (i.e. electronics, vehicles, civil aviation, shipbuilding etc).

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The key challenges for defence industries

As indicated, one of the key challenges for defence industries in general is the future trend in national defence budgets - both within the EU and at world level. Already before the recent economic downturn, defence budgets were either growing very slowly in real terms, or already falling, on the back of tight budget policies throughout the EU in order to cut back the public debt' share of GDP. Ageing and structurally rising social budgets were indeed putting a lid on the potential growth of public expenditures - in particular expenditures on defence, if not on defence & security.

Given the consequences of expansionary fiscal policies in 2008 and 2009, aimed at preventing a collapse of the financial sector and limit the extent of recession, public indebtedness has grown again. It will take many years before the public debt to GDP ratio returns to the pre-crisis level. In the meantime, expansionary defence procurement budgets are highly unlikely. Given that equipment costs rise typically faster than inflation, the slow (nominal) growth in defence

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budgets means stagnant or declining budgets in real terms, hence overall reductions in defence equipment expenditures.

Other challenges include the fragmented nature of the industry, and the high concentration of employment in certain regions: although the defence industry is more vertically integrated than other industrial sectors, there are thousands of diversified SMEs which serve the larger defence contractors. Altogether, there are presently too many companies in the sector in the EU, many of these being too small to survive in an increasingly competitive and global environment. At the same time, the high concentration of employment in certain regions is a source of vulnerability and is perceived as a threat on the social front.

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Finally, comparatively **low spending on R&D in the EU** as compared with the US and other leading technology producers (such as Japan) is perceived to potentially hamper the EU industry's future technological competitiveness.

Summary of the key strengths, weaknesses, opportunities and threats for defence industries

Strengths	Weaknesses
 Existence of world leaders in Europe Dual markets High internationalisation of key players Existence of niches of competencies Consolidation/restructuring well under way in certain segments Balanced aged pyramids in large defence contractors High skill level of workforce in EU defence industry. Intra-firm job mobility possible 	 Fragmented EU industry, low internationalisation of SMEs Growing costs of new equipment & defence systems Comparatively low spending on R&D Difficulties in cooperating across borders Risks of skill depletion linked to delays/ postponement of programmes Risks linked to age pyramids in SMEs Low attractiveness of defence industries for new entrants in labour market
Opportunities	Threats
 New EU regulatory environment for defence High needs for replacement, upgrading and retrofitting of defence equipment & systems Growing maintenance market Outsourcing of traditionnal military functions Growing security market Civilian applications of defence technologies Growing demand from non-EU countries 	 Stagnant or declining overall defence budgets within the EU Slow growth in global procurement demand Growing competition from emerging producers in other countries High entry barriers in non-EU markets Low attractiveness of industrial activities for new entrants into the labour market

Yet, there are also opportunities which the industry has to prepare itself for: among these are the **fast growing markets for certain products and equipments** such as drones, civilian applications of space technologies and equipment related to the growing security market, and there are also **high replacement needs** for

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certain types of equipment (air carriers, missiles, etc...). In addition, demand from non-EU countries is also growing faster than within the EU.

To make the most of these future opportunities, the industry has engaged a **general process of consolidation** in Europe: acquisition

activity has accelerated in the past years, including across borders. Large defence contractors have emerged, which are now able to threaten the US giants and competitors in other parts of the world. Among these key EU players are Thales, Safran, BAe, EADS, MBDA, etc. The consolidation is, however, still underway in some segments. In the naval industries, as well as in the land vehicles and land defence equipment industries, there are still too many producers which operate at national level and develop competing programmes at EU level. This leads to a misallocation of (scarce) resources.

Past and potential future trends in employment

Direct employment in the EU defence industry is estimated to be between 350 000 and 750 000,

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depending on the source considered. The fairly wide range reflects the type of companies that are included in the estimate: for the lower figure, only the large defence producers are taken into account, whereas the higher estimate also includes some smaller companies which sell a significant share of their production to the defence companies.

Including indirect employment, BIPE estimated that **up to 1 640 000 persons were concerned by the trends in defence equipment and services' production in Europe in 2006**. This later number covers all the direct and indirect employment, i.e. it includes all salaried workers employed by prime contractors as well as Tier 1 and Tier 2 suppliers (component and system manufacturers), many of which are SMEs.

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Estimated employment by type of activity in EU-27

Direct employment in prime contractors, defence only: 211 500 =13%	Direct employment in tier 1 contractors, defence only: 193 500 =12%	Employment in tier 2 contractors, linked to defence: 162 000 = 10%	
Direct employment in prime contractors' civil production: 160 700 = 10%	Direct employment in tier 1 contractors, in civil production: 256 500 = 15,5%	Other employment in tier 2 Contractors: 188 000 = 11%	
Indirect employment = employment in related (tier 3 and higher) industries 470 000 =28,5%			

Since 1993, defence employment levels have declined substantially in most EU countries. In 2003, employment levels in Slovakia were only

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10% of the 1993 level; in Hungary employment had fallen by 70%. In France, the reduction was 30% over the same ten-year period.



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Change in employment levels across countries, base 1993=100

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Defence industry

On average in the EU-27, one job in two disappeared in this sector between 1993 and 2003, as the number of people employed (source; BICC Conversion surveys, 1993 to 2006) dropped from 1,522 to 722 thousands. Again, the 2003 employment level differs from the number recorded by BIPE looking at the individual companies' job figures – the difference being probably due to a focus on the larger groups in the BICC figures. Defence employment is highly concentrated at regional level, since the location of plants has usually been determined historically by security concerns and kept away from urban centres. Thus, a number of local communities are heavily depending on developments in the activity of defence facilities and factories. Defence employment is also often highly skilled and very specialised, with a high proportion of engineers, scientists and higher levels of qualification.

Panorama of the European defence industry - poles of employment



The key challenges for defence industries

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Generally speaking, the employment in the four key segments of defence industries (land, naval, aerospace, electronics) is both highly skilled and highly specialised. In particular, one finds a higher proportion of engineers and scientists, and higher levels of qualification in the defence industry than for industry as a whole. Yet, in all segments (aerospace, naval, land and electronics), skill needs have changed over time. In particular,

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one observes an upward trend in the average competency level required at the recruitment stage. One also observes, in most defence sectors, an ongoing shift from manual workers to professionals and technicians of various types, as well as to engineers and computer programmers. Skilled workers nevertheless remain in high demand (which is not the case for un-skilled workers).

Composition of employment in aeronautics and defence by skill level



Two final observations on the present employment situation in defence industries, which bear consequences for the future, are:

- 1. There appears to be no "agetrap" in the large defence contractors: most have anticipated the ageing phenomenon in industry, and re-balanced the age pyramid at work. Therefore, in the large companies at least, one does not expect a "recruitment boom" in the next 5-10 years. This may, however, not be the case for many SMEs: those which have a high proportion of workers aged 50 or more are at risk of losing skills and know-how as these leave for retirement in the next 10-15 years.
- 2. The skills needed in defence activities are, with some exceptions, not significantly different than those required in civilian activities. For those companies engaged in dual markets, the impact on employment of cyclical trends in activity in defence activities can partly be attenuated through internal mobility of workers. There are, however, some highly specialised and technical activities for which internal mobility is

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not an option: these functions need to be identified and specifically supported in order to avoid skill depletion when programmes are delayed.

Future trends in employment will depend on the trend in procurement, on the future organisation of production at EU and world levels, and on technological change. For all three factors, the trends are likely to differ across defence industry segment: replacement orders and trends in maintenance and retrofit needs indeed vary across segment, as does the degree of externalisation of production, the geographical organisation of production, and the rate of R&D and innovation. For example, whereas the electronics' industry spends up to 14% of its turnover on R&D, the share is only 12% for aerospace. 10% for naval industries and 6% for land equipment industries. Delays in new programme launch can have major impacts on employment in industries such as defence, where employment is highly specialised, so that the future trends in research budgets - both public and private - will have a major influence on future trends in skill needs by sector.

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The chosen scenario framework



Different scenarios have been presented, which differ based on the degree of intra-EU coordination of procurement and production, and on the degree of preparation of change.

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The first scenario, entitled "Coordinated EU procurement with preparation of change", assumes a rapid shift towards coordinated equipment purchases at EU level, with due "preparation" of change by the industry' stakeholders; in this scenario, employment falls rapidly in the first years due to reorganisation of production, the rationalisation of duplicated R&D

programmes and the concentration of production in fewer locations. Yet, the financial savings made possible by this rationalisation of production at EU-level makes it possible for governments to step up R&D expenditures, helping the defence companies to remain innovative and regain competitiveness in world markets. This leads, after a few vears, to a stabilisation - and possibly even to new increases - in employment levels. Indeed, with appropriate anticipation of change, synergies are developed between defence and civilian activities, to the benefit of the EU

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Defence industry

civilian aerospace, railway rolling stock, automotive, shipbuilding and other equipment industries.

- The second scenario, entitled "Coordinated EU procurement, no preparation of change" assumes that the early shift to more coordinated EU procurement has not been preceded by due preparation by the industry' stakeholders. Market forces are left at play to define who wins the orders, and restructuring takes place as events unfold, leading to difficulties for companies to maintain skills when they are not directly involved in a particular defence programme;
- The third scenario, entitled "National procurement – no anticipation of change" assumes a continued a preference for national procurement. If this scenario makes it possible to save jobs in the first years of the forecast, after a few years, however, the lack of funding for new programmes and the absence of competition between players at EU level, eventually lead to losses in external competitiveness and more rapid falls in employment from 2011-2012 onwards than in the first scenario;

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• The fourth scenario assumes a continuation of national procurement policies albeit with preparation of change: the fall in overall employment is greater in the short term than in the third scenario, but the long term result is nevertheless below the "coordinated Eu procurement" scenario, as R&D expenditures have fallen behind due to budget constraints and continued duplication of efforts at EU level.

The chart below illustrates the trend in employment in the sector as a whole – including indirect employment – in each of these four scenarios, and compares the expected outlook with past trends in employment between 1993 and 2003.

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As illustrated, the scenarios lead to a wide range of possible outcomes – with total employment (direct + indirect employment) falling between 30% or 50% over the next 10 years depending on the scenario. The "worst-case" scenario is a continuation of the trend initiated in 1993 in the EU as a whole, when employment fell by 50% between 1993-2003 (Source: BICC Conversion Surveys), even though the 1993-2003 coincided with deep restructuring in eastern Europe as part of their transition

to market economies. The 30% decline represents a continuation of the trend observed in France in the past 10 years, with falls in employment approaching 3% per

year in defence industries, slightly higher than the average decline in employment observed in industry as a whole.

Change in direct and indirect employment levels as a result of the changes in production and organisation of EU defence industries



The trend in employment in each defence-market segment will be similar to the above pattern, albeit with differences in the rates of magnitude of the change, depending on the market considered. Thus, a slower decline in employment than shown here is expected in the aerospace industry, whereas a faster decline is likely to be registered, especially in the long term, for the naval and land defence industries.

Consequences of these prospective changes

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Consequences on competencies and skills needs

The analysis of trends in skill needs across segments of defence industries indicates a number of trends common to all sectors:

- There is an ongoing shift from manual workers to professionals and technicians of various types, as well as engineers and computer programmers;
- The numerisation of functions and organisational changes linked with technical progress lead to a growing demand for machine operators;

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- Within all occupations, there is a continuing increase in the importance of computer skills and know-how;
- Risk management has grown in importance; this is particularly the case with risks linked to IT and communication, but not only;
- The internationalisation strategies of most prime contractors lead to a new distribution of skills and competencies needs across Europe.

The table below shows the link between contextual changes and changes in skills needs in the coming years. ()

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Impact of context changes on skill needs in the defence industries

Context changes	Consequences for employment and skills needs
 Re-organisation of production in a tiered structure Externalisation of activities Improvement in productivity and efficiency Increased internationalisation of operations linked to the Pan-Europeanisation of production Need for increased R&D and new programmes Increased (non-price) competitiveness 	 Impact on governance, operating practices and management Reduction in number of hierarchic levels & shift to matrix type organisations cause a need for more collaborative working environments, cutting across functions team workstructures, polyvalence Increased need for certain support functions: Cost control, quality control, procurement, marketing and sales Internationally oriented competencies (language, communication,) Focus on marketing and commercial skills Management of procurement, of subcontracting, optimisation of logistics (incl. for maintenance) Expert skills for the production and handling of new materials & technologies (composites, robotics, etc.) Specialisations in the manufacturing, maintenance and recycling of technical materials (composites, energy efficiency, etc.); Competencies focused on protecting the environment and work ethics

Source: Eurostrategies

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The table shows the types of skills that will be in higher demand, and the types of functions that may develop or, on the contrary,

become less important in the coming years, irrespective of the future development scenario.

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Centres of excellence

Many in the industry are calling for the development of "centres of excellence" in Europe, whereby certain regions would specialise in certain types of production and host training institutions that would supply the required skills, to the region itself and to other regional markets. This would effectively create "educational hubs".

Yet, for the "centre of excellence" concept to be effective, certain conditions must be met: - These Centers of Excellence will have to take on both research and manufacturing activities:

- They have to be totally independent of national governments (to avoid a given country government's exclusive control of a sensitive technology and/or process);
- Their objective has to be to supply graduates trained in the given area to any EU country needing that skill. This calls for increased workforce mobility.

Indeed, experience shows that, to maximise the chance of their leading to applications that respond to market needs, research activities have to be located close to production centres. Linkages between fundamental research and industry are also important in order to facilitate the transfer of knowledge beyond the early innovation stage, and to ensure that the companies can find locally the skills that they will need to organise the production on a large scale.

The need for independence from national governments results from the need, for the Centres of Excellence to fulfil their role, to train personnel and develop innovations that can serve the whole EU industry. The Centres of Excellence's role will be to develop sensitive technologies and train personnel in highly specific areas, to irrigate thereafter the whole EU industry. The mobility of personnel has to be high in order to maximise cross-fertilisation of skills and competencies across the EU, and make it possible to capitalise on the best experiences from all parts of the EU. Several Centres of Excellence could therefore be created throughout the EU, each having different areas of specialisation, but be complementary to each other and inter-linked in order to foster knowledge transfer. These could be financed partly through research grants provided by the companies, and partly through sponsorships or grants by the Member States.

Some problems remain:

- Companies themselves often are the key source of know-how: this is why the link between companies and the centres of excellence has to be so strong, and why the location choices that will be made for those centres – if the idea goes ahead – will totally reshape the EU defence industry;
- In the regions in which certain production lines will be de-emphasised or closed, there are specialised jobs whose conversion can be difficult;

There can be issues with national security (due to sensitive technologies and processes);

 Governments, which are the principal clients of defence companies, themselves have conflicting objectives: they want both to ensure a return on investment, and avoid overreliance on other states, even if they are allies and partners.

Other problems and issues are that:

- The location of the "centres of excellence" will influence the location of the future civilian activities;
- Cross-country mobility of the workforce will have to be enhanced.

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Consequences for the industry' stakeholders

To prepare the changes ahead, the following are needed:

 Increase visibility on future procurement trends: in an industry in which programmes are launched for the long term, and a large share of the activity is linked to retrofitting and maintaining existing equipment, one could expect companies to have a better visibility on the future trend in orders;

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- There appears to be a need for "employment observatories" that would provide information on past and present employment levels, and on planned employment and skills needs, taking into account foreseen trends in orders; these observatories ought to be launched at regional level (and coordinated at EU level) in order to help local stakeholders to anticipate future skill needs and launch the necessary training or retraining programmes;
- These observatories could also constitute databases of "good practices of anticipation and management of change and restructuring at company and regional level";

- The observatories could also include analyses of the consequences of different types of redeployment measures or of practices aimed at improving employability, in order to help users to assess under which condition a given measure is likely to be most effective;
- Improve the attractiveness of the industry to young workers: although there appears to be no "age trap", there is a continued need for new skills and replacement of workers leaving the sector; even if employment levels fall "on average", the companies will continue to recruit, and need to find the right competencies on the market, and to be able to retain them;
- Improved education and training system, in order to provide the young people with the technical skills needed that are in growing demand;
- Identify "best practices" in preparing and managing change in this sector: the examples provided during the Forum were considered to be somewhat specific and not necessarily adaptable to other companies or local situations; there is a need to define,

Defence industry

with the social partners, "good practices";

- Help regions diversify their activity in order to reduce their dependence on a single – or only a few – sectors: in many regions, one finds a high dependence on defence-related activities. Given the synergies between defence activities and certain civilian equipment producing sectors (civilian aeronautics, space, automotive, shipbuilding, electronics or even railway rolling stock), there is a case for attracting new investments in these areas, or for developing "cross-regional clusters" of competencies by building linkages between the region's defence industry and other regions" related civilian activities:
- Help SMEs' to grow in size and improve their degree of internationalisation (i.e., ability to work with foreign partners or clients, and to accompany their

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existing clients in their international expansion) and develop a presence on distant markets (whether these are EU or non-EU markets) by ensuring that they have access to finance for LBOs, takeovers or mergers, and adequate guarantees;

- Create a level-playing field for businesses;
- Increase support for R&D;
- Improve co-ordination of policies across the EU, and across governmental bodies within the EU Member States in order to:

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- smooth out procurement cycles;
- reduce barriers to trade, which hamper the competitiveness of EU industry;
- foster cross-border mobility of workers, especially for displaced workers.

Conclusions and key findings

Even if the anticipation of skill needs can only be done by defence industry segment, there are common trends in all segments.

Although no "breakthrough" technology is identified that will radically change the mix of competencies that are needed in the next 5-10 years, technological progress is a major goal for the industry in order to maintain its competitiveness:

 Yet, R&D mobilises specific skills and competencies;

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- The quality of basic education and the availability of the most sophisticated equipment/ technologies in the schools are important;
- More efforts will have to be made to succeed in this area, where the gap with the US has widened.

To assess the social consequences of restructuring, one needs to:

- Look at future skills needed by market segment (land, aerospace, naval, electronics);
- Take into account the possible inter-changeability of the workforce between the defence,

security and civilian sectors;

Once Pan-European restructuring really gets under way, increased geographical mobility of the workforce will be a requirement.

Location decisions made for defence activities will have a key impact on civilian activities, especially in the case of:

- Aerospace, notably propulsion systems and R&D;
- New materials;
- Electronics;

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The role of the European Defence Agency (EDA) is thus very important in this respect: indeed, the EDA encourages Member States to cooperate more in common procurement projects, and improves transparency in the EU defence equipment market by means of the Regime/CoC of Defence Procurement.

Also, whereas there is general agreement that increased internationalisation of skills and openness to "other countries" will have to increase, low international – and even cross regional – mobility of technical personnel Defence industry

will be an issue. Indeed, if young graduates are generally geographically mobile, skilled workers and technicians are typically recruited locally.

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Hence, the availability of skills at

local level will need to be closely monitored and coordinated with the companies present locally.

Hence, regions are a key actor in the management of transition.

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Where to find more information?

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The following information can be found on the Europa website under the address: http://ec.europa.eu/restructuringandjobs

The other 17 sector studies on the analysis of the sector's evolution and future skills needs The Restructuring in Europe report The thematic restructuring forums The checklist and the toolkit on restructuring processes The training guide for SMEs The national seminars on restructuring in 27 EU countries Official documents related to restructuring policies

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