COUNCIL OF THE EUROPEAN UNION

Brussels, 31 July 2009

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COVER NOTE

from:	Secretary-General of the European Commission, signed by Mr Jordi AYET PUIGARNAU, Director
date of receipt:	31 July 2009
to:	Mr Javier SOLANA, Secretary-General/High Representative
Subject:	Commission staff working document - European industry in a changing world - Updated Sectoral Overview 2009

Delegations will find attached the Commission document SEC(2009) 1111 final.

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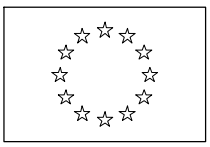
Encl.: SEC(2009) 1111 final



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 30.7.2009
SEC(2009) 1111 final

COMMISSION STAFF WORKING DOCUMENT

EUROPEAN INDUSTRY IN A CHANGING WORLD UPDATED SECTORAL OVERVIEW 2009

Foreword

At the time of writing, European industry is undergoing the worst economic crisis in decades. Output has fallen from a peak in 2007 to a level not seen since 1998. The crisis has affected all sectors, though not evenly. The biggest falls in output have been in motor vehicles, metal machinery, electrical equipment and textiles, but other sectors such as pharmaceuticals and food have remained relatively stable. In addition the outside-EU exports of several sectors have contracted sharply in recent months.

The aim of this Sectoral Overview is to provide stakeholders and policy makers in the European Institutions or in national administrations with responsibility for, or interest in, the development of industrial and economic policy with a succinct analysis of the current situation, and the factors affecting competitiveness, in all industrial sectors. It may also be of relevance to businesses and economic researchers who are interested in recent policy developments in the key industrial sectors. The focus here is on making a strategic assessment of the sector's competitiveness taking account of the market structure, impact of the regulatory framework, external competitiveness, and the response to structural change.

The first such Sectoral Overview was published in 2005 when the Commission set out its integrated approach to industrial policy, based on a concrete work programme of cross-sectoral horizontal policy actions, as well as some that addressed the specific needs of individual sectors. A technical update of the Sectoral Overview was published in 2006, but it was now appropriate to make a more thorough revision. The basic format remains unchanged but greater emphasis was given to showing how the industrial sectors have responded to the challenges of globalisation, technological change, and concerns about climate change and the environment. In particular, in view of the transition to a more knowledge-based economy, the sections on "R&D and Innovation", and "Knowledge and Skills" have been given increased attention. In addition, each chapter has been revised in the light of the sector's vulnerability to the financial crisis.

The structure of this Sectoral Overview follows broadly the 2-digit statistical classification, but some sectors (e.g. pharmaceuticals, cosmetics) have been separated out for closer examination. In addition, many chapters are included on "sectors" which are important from a policy perspective, but do not correspond to any simple statistical classification (e.g. Defence, ICT, Space). In addition, chapters have been included on the rapidly expanding eco-industries, as well as some service sectors whose performance has an impact on the industrial users of these services. Each chapter contains some basic facts and figures which characterise the sector. For a more thorough statistical analysis, interested readers are referred to the forthcoming complementary publication "EU industrial structure 2009" published by DG Enterprise and Industry in 2009. Some chapters (Information and Communication Technology, Eco-industries and Business-related Services) are markedly different from the others as they consist of, or are dominated by, service activities, reflecting the fact that the distinction between manufacturing and services is becoming more and more blurred and artificial.

The sector-by-sector approach taken in this publication does not just give an assessment of the situation in that industry; it also helps to identify the issues that are common to many sectors. The current financial crisis and the collapse in demand for many industrial products shows clearly that some sectors will have to undergo substantial adjustments in the coming years. In addition, (although the economic crisis and rising unemployment have deflected attention

from the fact) several industries seem to have in common that a shortage of properly qualified and skilled labour force that might endanger their medium-term competitiveness. This highlights the need, more than ever, for sound micro-economic policies and a proactive industrial competitiveness policy aimed at providing the best possible framework for European industry in order to remain globally competitive, whilst at the same time facilitating the necessary adjustments and minimising negative societal impacts.

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1. AERONAUTICS

Basic facts and figures[1] on the sector

In 2007 the European aeronautics industry directly employed about 442,100 people and had a turnover of €94.5 billion, It invested about 12.4% of its turnover in research and development (this number includes both company financed and government financed R&D). More than half of the output (civil and military aeronautics) is exported outside Europe.

The success of the industry depends on its twin pillars, civil (58%) and defence (42%).

In a growing global aeronautics market totalling about €284 billion, the European aeronautics industry has a market share of 36.4% compared to the US with 51%, Canada with 5.5%, Japan with 3% and other countries with about 4%

Competitiveness assessment

The European aeronautics industry is a high tech industry which develops and manufactures a broad range of products: civil and military aircraft, aero-engines, helicopters, unmanned aerial vehicles (UAVs), as well as systems and equipment. Many companies in this sector are active in both civil and military aeronautics. They are both complementary and mutually dependent. Operating in civil and defence markets allows companies to share know-how, skills and products and to benefit from the economies of a broad range of products. Both areas rely on the application of advanced technologies, while serving private and public customers with different needs. The recent decline of the US$ against the Euro has put the European aeronautics industry in a difficult position vis-à-vis its main US competitors and led to a decline in price competitiveness, which it was only possible to reverse by severe cost cutting and greater internationalisation of production. This situation improved during the financial crisis in October 2008. Impacts of the financial crisis which can be felt at this stage include difficulties for the aeronautics supply chain to obtain loans from banks. It can also be noted that airlines are postponing the purchase of already ordered new aircraft. However, this is a global problem and affects all aircraft manufacturers.

R&D and innovation

A stable, long-term policy framework is essential, especially for R&D. Aerospace is an industry which must, by the nature of its business, look far into the future: a new generation of aircraft can take a decade or more from conception to realisation, with an in-service life of many decades and many upgrades thereafter. The medium and long-term strategic research agenda has been developed with support of the European Union through the technology platform for aeronautics research in Europe, ACARE. This body regularly reviews the research objectives to ensure that research projects correspond to the pressing needs and challenges of the sector. Investment in R&D represents a considerable burden, especially in the current tough economic climate and in trying to meet the required and planned environmental standards. Public and private R&D expenditure in the aeronautics sector

[1] Figures in this section provided by: ASD Eurospace Facts & Figures 200 – The European Space industry in 2007; the data include EU-15, Czech Republic, Poland and Bulgaria, as well as Norway, Switzerland and Turkey.

represents about 12% of turnover, which is a very high percentage compared to other sectors. The Commission is supporting the industry in developing the new technologies, in particular through the 7th Framework Programme for Research and Development. The 'Clean Sky' project, for example, which is jointly financed by the European Union and the European aeronautics industry, will be investing €1.6 billion in green technologies.

Knowledge and skills

Europe must ensure that it maintains and builds on its advantages of knowledge, skills, critical mass, RTD support, etc. to keep activity in Europe. Safeguarding and further developing a strong European skills base will be a key factor in maintaining global competitiveness. The overall performance of education and training systems must therefore be improved, as part of a lifelong learning perspective. Signs that highly qualified personnel currently employed will be retiring in the next 5-10 years and that it is proving increasingly difficult to recruit new employees raise particular concerns, because the growth forecast for the sector also shows an increase the need for scientists and engineers.

Market Structure: Regulation

Given its obvious security and safety requirements, the aerospace industry faces very detailed certification procedures to meet airworthiness standards for aircraft and components. The establishment of European Aviation Safety Agency (EASA) in December 2004 means that there is a single entity which can take binding decisions. Given the importance of this issue for Europe's major aerospace companies, industry has been closely involved in setting up the new EASA structures and in expanding EASA's competencies to other areas. EASA could become a European counterpart to the very influential US Federal Aviation Agency (FAA). So far, the FAA dominates aviation safety-related discussions worldwide. Experience has also shown that FAA action has supported US companies in their competition with European manufacturers in selling aircraft (and equipment) in third countries.

Environment

The aerospace industry is affected by other policy initiatives and EU regulations, for example the implementation of REACH (industry could face significant adaptation costs and time-to-market problems if substances used for specific purposes in this industry are withdrawn), legislation on chemicals, environmental legislation or general initiatives in the area of transport. The Commission is working with the industry to support the implementation of REACH. Legislation addressing airlines can also have an impact on the aircraft manufacturers (e.g. the adopted proposal on including aviation emissions in the European Emissions Trading Scheme) if they result in a reduction of the demand for air travel. Active participation of the European Community in international organisations such as ICAO (International Civil Aviation Organisation) is key to guaranteeing the worldwide application of common standards for noise and gaseous emissions, as well as ensuring an efficient match between the European regulatory system and global requirements.

External competitiveness

The aeronautics industry is characterised by specific industrial structures, which result from the scale of the financial and technological challenges; for example, the market for large civil aircraft is dominated by two global players and the market for large aero-engines essentially by three global players. Similarly, there are only a handful of manufacturers of missiles,

helicopters and launchers in the world. However, unlike the civil side, the market for defence goods is still partitioned, since State bodies are the only buyers. As regards international competition, US companies operate in the world's single largest home market and benefit from a highly supportive operating framework, which is designed to underpin a declared policy aim to maintain US supremacy in aeronautics and space. The direct linkages between defence and civil uses, and the heavy investment in defence to fund research and innovation, bring clear advantages to US industry in terms of beneficial spin-off effects in non-defence aerospace applications. This situation poses a constant challenge to European industry, and one which affects its competitive position. Other challenges are expected to arise in the medium-to-long term from other competitors in the aeronautics business who are emerging in China, Russia, India and Japan. The aeronautics industry will need to react to those challenges and to carefully strike a balance between commercial interests and risk of technology transfer which might lead to a loss of competitiveness. The sector will need to strengthen its efforts to stay ahead and develop new and innovative products for the world markets.

Employment and geographical dimension

Employment is both highly skilled and very specialised. In particular, one finds a higher proportion of engineers and scientists, and higher levels of qualification. The relative importance of the aerospace industry, compared to overall EU employment, varies within the EU. The group of countries with an above-average share in overall employment includes not only France and the UK, but also Luxembourg and Sweden. Given the global nature of the business, suppliers face stiff competition from around the world, as transport costs are relatively unimportant compared to technical and financial capability (in terms of contributing towards programme development costs).

Areas of growth (within the sector)

The strong growth in this sector in recent years has led to a huge backlog of orders and it is expected that, in spite of the crisis, this growth will continue to guarantee full order books for the next few years. However, it remains to be seen whether customers will postpone or even cancel orders due to an increasingly difficult market environment and if deliveries in 2009/2010 might therefore be considerably reduced. Until recently the biggest growth areas in the sector had been in business jets and turboprop engines.

Response to structural change

The aerospace industry has almost completed its process of consolidation, which has resulted in significant industrial restructuring across European borders. Development and production of airliners, military aircraft, helicopters, aero-engines, systems and equipment are now largely in the hands of major enterprises operating at European level. At the same time, relations between governments and aerospace companies have changed, leading to a situation where former State-owned companies are now wholly or partly in the private sector, quoted on stock markets and committed to providing value for their private stakeholders. Consolidation and increasing global sourcing has also affected the aeronautics supply chain. Suppliers need to develop into risk-sharing partners, be able to handle bigger work packages, and provide sufficient financial capabilities to bear development costs for new programmes. They are also encouraged to work with partners around the globe. More cooperation or even consolidation at supplier level is therefore likely.

Structure of sector

The aeronautics industry is part of the aerospace industry, which is composed of companies working in the aeronautics, space, defence and security business. It is characterised by a small number of very large firms a large number of medium-sized companies and a very large number of small companies. Many companies are not operating in only one of these subsectors, but develop products which could, after certain modifications, be used in other subsectors (civil/defence). Data for aeronautics include both the civil and the defence part of the business. The turnover of the aerospace industry is overwhelmingly dependent on civil / military aeronautics (71.5%). Space accounts for 6.5% of turnover, and land and naval defence for 22%. The structure of employment in the aerospace sector is fairly similar, with 68% of employees working in civil/military aeronautics, 5% in the space business and 27% in land and naval defence.

Sector-related services

The sector provides several services, which are often outsourced to specialised companies that also provide this type of support for other sectors, particularly in the fields of IT support services, recruitment services, testing of equipment and training of personnel and customers (pilots / aircraft maintenance).

2. AUTOMOTIVE[2]

Basic facts and figures on the sector

The automotive industry is one of Europe's key industrial sectors, and its importance is largely derived from its linkages within the domestic and international economy and its complex value chain. The automotive sector has a turnover of over €780 billion. Value added in the automotive sector amounts to around €140 billion, representing about 8% of European manufacturing value added. It directly employs more than 2 million people and is responsible in total for more than 12 million jobs across Europe, which is equivalent to about 5.5% of employment in the EU-27. In 2007, its best year so far, the European automotive industry produced about 19.7 million vehicles (cars, trucks and buses), equivalent to about 27% of total production worldwide (17.1 million of which were cars - a segment in which the EU holds a global market share of about 30%). Exports of cars from EU-27 countries amounted to €125 billion, with imports of €65 billion, giving a trade surplus of €60 billion.

Competitiveness assessment

Although the existence of a large home market is a major competitive advantage for European manufacturers, growth in mature Western European markets has been broadly flat in recent years. New Member States used to provide growth opportunities (with their ratio of vehicles to people much lower than in the replacement markets in EU-15) and helped to maintained slow but continuous expansion of the EU market. This market growth and the market itself collapsed in late 2008 due to deepest economic recession in the post-war era. The visible slowing in the decline and recovery of sorts as of the second quarter of 2009 is mostly due to the introduction of scrapping schemes in 12 Member States, with highest incentives and most spectacular results in Germany.

The industry recovery is forecast to be sluggish and to occur at earliest in second-half of 2010 with most of the projected future increases in vehicle consumption due to come from emerging markets (China, India, Russia), where European manufacturers have already a significant presence.

Still in the short-term, utilisation of capacity remains an issue for this industry, as slow demand, existing production facilities in Western Europe and substantial investments in capacity in Central and Eastern Europe have created sizeable overcapacity. Whereas capacity utilisation in previous years was around 80%, it has dropped to 65% at the beginning of 2009. Significant differences exist between the MS.

In the medium-term, the technological competition in this industry is set to intensify, with different fuel and energy concepts plus intelligent transport playing a particularly important role. As the European industry is the world-leader in premium vehicles and has a strong supplier base, it is once again well-positioned to take advantage of these developments. It is likely that strict regulatory standards for environment and safety at the European level will also play an important role in driving this process. The industry has also expressed concern

[2] NACE 34

over access to raw materials in the future and it is likely that competition in this area will continue to intensify.

In the long-term, the global market for motor vehicles is set to grow substantially, with various estimates suggesting that the global vehicle park will increase from the current 800 million vehicles to between 2 billion and 3.5 billion by 2035, mainly in the market segment of smaller and low-budget cars. In principle, European manufacturers are well placed to take advantage of this market opportunity and Community trade policy plays a supportive role in terms of enabling fair market access.

The European Commission has set up a dedicated process (CARS 21) to regularly monitor and evaluate developments in competitiveness in relation to the car industry.

R&D and innovation

The European automotive industry is a global technology leader - largely due to substantial investments into innovation, but also as a result of a demanding home market. The vehicle industry is investing ca. €24 billion per annum into R&D, which represents around 30% of European industrial R&D. This is complemented by investments in the production process and fixed assets amounting to over €40 billion per annum. About 50% of R&D investment comes from automotive suppliers, as do the majority of the patents. European automotive firms are leaders in some transitional drive-train and fuel technologies and are investing in ground-breaking technologies, such as battery-powered hybrid vehicles, electric vehicles and hydrogen. As products are becoming increasingly complex from a technological point of view (e.g. the role of electronics), the industry is focusing increasingly on advanced, high technology products which necessarily rely on a highly skilled workforce. The threat of falling behind in groundbreaking innovations is ever-present, as the industry's international competitors have also stepped up their innovative efforts. It is expected that major technological breakthroughs could permanently alter the processes employed by the industry, and it is important that European companies are not only the leaders in innovation, but are also able to rationalise the use of their R&D resources. Given that research into "future" technologies, such as electricity and hydrogen, is unlikely to bring any significant competitive advantages to the industry in the short term, joint research projects between the industry and the public authorities should continue to be encouraged.

It is important to underline that the EU reaction to the crisis in the automotive sector is focusing on preserving the R&D activities, which is key to ensure that EU manufacturers are well positioned when the economic upswing begins.

Market structure: Competition

In the European automotive markets competition is intense. A significant decline in real prices for new motor vehicles over the recent years, successful new entries, significant fluctuations in market shares, increased consumer choice within the various market segments combined with shortening of model life-cycles are evidence of a generally dynamic competitive environment. Comparatively modest but fluctuating average profits and constant R&D expenditure are further supportive elements. Competitive pressure can be expected to increase further as car manufacturers from emerging countries enlarge their presence on the EU markets.

The consolidation which has occurred in the global automotive industry over the past few decades is now accelerated by the crisis. The difficulties recently experienced by the main American manufacturers (who have a substantial presence in the European market) have resulted in the sale of Jaguar and Land Rover to Tata Motors. The situation in the US further deteriorated culminating in Chrysler and General Motors undergoing court-supervised bankruptcy with ripple effects on the European markets. While Fiat established truly global presence by alliance with Chrysler, European subsidiaries of General Motors will be acquired by new investors – likely outside by the EU. One of the drivers of further consolidation and new alliances will be linked to overcapacity and a price competitive market, which is likely to lead to as much cost optimisation as possible. Many manufacturers are already co-operating in both production and R&D (e.g. in form of automotive clusters), which logically could provide a platform for further restructuring or consolidation in the industry. The restructuring process also concerns automotive suppliers who are currently in the process of consolidation accelerated by the recession.

Market structure: Regulation

Given the vehicle industry's societal role and economic importance, it interacts with many key areas of European life and, hence, of European policy. Apart from the obvious link to competitiveness and industrial policy (Lisbon Agenda), the automotive industry is an important consideration in the internal market policy, transport and energy policy, environmental and climate policy, trade policy and research. Motor vehicle manufacturing is one of the most regulated areas in the EU (covered by approximately 80 EU directives and 115 UN/ECE regulations), owing to the technical complexity of the product and the effects of motor vehicle use on the environment and the global climate (e.g. CO_2 emissions and fuel efficiency, pollutant emissions, End-of-Life Vehicles), safety (e.g. General Safety Regulation, Pedestrian Protection) and mobility. The stringency of such regulation involves additional costs for the industry and it is important to ensure that the cumulative costs of regulation are taken into account when developing legislation, and that industry is given sufficiently long lead times to fit its product cycles. On the other hand, regulation can also have a positive impact in terms of consumer benefit (such as fuel savings) and of driving technological change. Harmonisation of legislation has been preferred over mutual recognition, as it provides the industry with certainty and predictability as regards their ability to market the same product.

Environment

Viewed over a longer time perspective, the biggest challenge for the industry is the reduction of CO2 emissions and improving fuel efficiency and the focus on active safety systems (i.e. collision avoidance). In addition to motor vehicles, other means of reducing CO_2 emissions should be part of an integrated approach to reducing CO_2 emissions from the road transport sector, as it is unlikely that the full cost of it can be borne by the automotive industry alone without affecting its competitiveness. However, the fuel efficiency of cars themselves should be achieved, in view of the potential rising demand for fuel efficient vehicles worldwide, climate change and high oil prices. An ambitious EU policy in this field will help maintain the technology lead of the EU automotive industry and thus support its competitiveness.

External competitiveness

In terms of market share, production volumes, value added, employment levels and net trade position, the industry has maintained its global competitiveness in recent years. The EU has traditionally enjoyed a significant trade surplus in automotive industry products (ca. €60 bn in 2007).

As a major player in international markets, Europe has established stable channels that constitute a competitive advantage and is among the prime beneficiaries of the opening of new markets and the strengthening of existing relationships, in particular with the large emerging countries. Further market access is therefore one of the main sectoral objectives in the context of the ongoing negotiation of Free Trade Agreements between the EU and third countries (e.g. South Korea, India). Current economic crisis has considerably stifled the growth of the global trade with a surge of protectionist practises, business uncertainty and difficult access to trade finance. The recovery in global trade is largely dependent on recovery of the global economy.

In the longer-term, most of the increase in the global demand for the industry's products will come from rapidly developing economies such as China, India or Russia and European industry has already begun to prepare itself for the expected mass motorisation in emerging markets by increasing capacity in these locations. Although the European industry currently holds a strong position and has a significant presence in most major markets, some areas such as the South East Asian countries still allow for significant increase of presence. EU's main competitors in world markets are Japan, the US and South Korea. It is expected that Indian and Chinese producers will also start playing a significant role in global markets in the near future. Generally, European manufacturers are doing better than their US competitors, but they face tough competition from Japan and South Korea. Europe's competitiveness as a production location is being threatened by other areas, which are catching up in terms of the supply of educated labour and have fewer restrictions on its flexible use. There has been a rapid build-up of capacity in the emerging Asian and Eastern European markets (Turkey, Slovakia, the Czech Republic, Poland, Romania), which combined with a world-wide drop in demand as from late 2008 may lead to world over-capacity and stimulate price competition. EU producers are not particularly well equipped for price competition and they tend to position their exports in the premium segments. This poses real strategic challenges for the established carmakers. The difficulty with entirely abandoning the volume market and focusing exclusively on the premium market is that producers need to spread the costs of research and development over as many vehicles as possible.

European manufacturers are reporting a series of problems with the Chinese, Korean and Indian market, ranging from discrimination in favour of local producers to the imposition of regulation without prior consultation. They have therefore urged the Commission to take steps to remedy the existing state of affairs. The ongoing Free Trade Agreement negotiations with some of those countries offer an important opportunity to address those main concerns.

Employment and geographical dimension

The automotive industry directly employs more than 2.3 million people, or around 6% of manufacturing employment. Most of those employed in the automotive industry (ca. 60-70%) are engaged in skilled (or semi-skilled) manual work, while 30-40% are trained professionals or technicians (e.g. engineers, business and sales specialists, or working in IT, quality control, marketing, management etc.). In terms of geographical spread, the role of automotive industry employment in manufacturing is particularly important in Germany (ca. 13% of

manufacturing employment), in Sweden (ca. 9%) and in France, Belgium and the Czech Republic and Spain (all with around 8% of manufacturing employment). Before the crisis, there had been a trend towards increased employment in the automotive sector in the new Member States, where some manufacturers have been installing substantial additional production capacity, while declines have been observed in some EU-15 countries. The new Member States have offered location advantages based on their skilled labour, lower labour costs and tax policy, which, combined with the EU regulatory framework context and proximity to major markets, have led to a high level of automotive-related investment into the region. This is why in the recent years most of the investment in new production capacities in Europe was undertaken in the new Member States. A picture of trade in the automotive sector shows the following features: significant net exporters are Germany, France and Spain, whereas net importers are UK and Italy. Germany produces about 50% more vehicles than it sells domestically, while Italy has been producing about half the number of units sold in the country. Central and Eastern Europe countries have been producing about 11 vehicles for every 10 consumed in their markets (Czech Republic, Slovakia and Poland produce each at least twice as many vehicles as consumed domestically). However, due to the important and intensified international division of labour along the value chain, especially within the European Single market, the story-line behind production and trade figures is much more complex. Indeed, it is estimated that for car manufacturers in bigger EU countries such as Germany, France or Italy about 40 percent (in value terms) of the components of a car assembled has been imported, 25 percent of which from other EU countries. For manufacturers in smaller countries, this share is estimated to be significantly higher.

The decline in demand and production since mid-2008 has brought a significant number of job cuts. The industry has been striving to preserve its core and most-skilled staff by reducing its temporary and agency workforce and short-term measures (temporary shut-downs, shorter working weeks, salary cuts, voluntary departures and early retirement). These measures are, however, largely exhausted. In the first quarter of 2009, a net loss of more than 21,000 jobs in the sector has been reported following a net loss of almost 32,000 in the last quarter of 2008. Industry has indicated that worsening market conditions could put around 15-20% of its labour force at risk – especially in the supply chain. This effect is going to be highly visible because of the clustered and geographically concentrated nature of the automotive industry. It should be noted that although these figures are heavily impacted by the crisis they also reflect the restructuring effort undertaken by the industry.

Areas of growth (within the sector)

In longer term – coinciding with full economic recovery – the main areas of growth will come from external markets, as rising income levels improve access to individual mobility. Thus, the main opportunity for the automotive industry will be in emerging markets outside the EU, such as China or India. In terms of the home market, stricter regulations on fuel efficiency are likely to lead to growth in related components and technologies (both to improve conventional engines and to introduce new power-train concepts). Furthermore, there is likely to be further segmentation between city traffic and longer distance traffic, both of which will need to be covered by the industry's products.

Response to structural change

Over the past few years, industry has been adjusting to a changed operating environment and it should be pointed out that much of the current restructuring process is a reaction to

structural problems that have existed in parts of the industry for some time and have now been exacerbated by the crisis. The automotive industry should not be viewed as a uniform whole: different producers and brands have different histories and legacies, can compete in different market segments and often face different challenges. Generally, however, many of these structural problems are related to comparatively low productivity levels, high labour costs and labour market regulations, high fixed costs and overcapacity. These conditions have now been aggravated by the sharp decline in demand.

Recent record prices in global commodity markets, combined with aggressive price competition among manufacturers, have led many automotive companies to focus on their long term competitiveness by reducing costs and improving internal efficiency. This, in turn, has an impact on the supply sector, whose relationships with the OEMs[3] are usually close and highly specialised. In terms of the location of production, the increased focus on cost management has been a major reason for automotive companies' investments into new capacity in the new Member States. In the light of existing production overcapacity in the European market, this has created fears of an inevitable reduction in automotive-related employment in the EU-15. In the medium term, it appears probable that vehicle assembly for the European market will still be largely conducted in Europe. The automotive industry and its supply chain are becoming increasingly global, yet the characteristics of demand are still relatively distinct in different markets, and most international automotive companies maintain a significant proportion of their production in situ. It is likely, however, that the challenges posed by more aggressive international competition will be even greater in the longer term. It is important that industry in Europe is able to draw on its competitive advantages, which are likely to be in the form of high value added, qualitatively advanced products and services requiring the efficient use of available resources, and a highly educated labour force.

Structure of the sector

Broadly speaking, the automotive sector can be divided into suppliers (who, in turn are split into different "tiers" depending on the complexity of the contribution to the automotive product) and Original Equipment Manufacturers (OEMs, who are responsible for the final product itself). Supply chain management (process innovation) is one the key strengths of the European automotive industry and the major European suppliers are among the world leaders. Typically, about 75% of a vehicle's original equipment components and technology are sourced from automotive suppliers. According to CLEPA (the European Association of Automotive Suppliers), the supplier sector includes some 3000 companies, of which 2500 are small or medium-sized enterprises employing over 3 million people. European suppliers are recognised as world leaders in technology and innovation, particularly in electronics, power-train and driveline components. The automotive value-chain provides an important outlet for sectors such as mechanical and electrical engineering, electronics, steel, metal-working, chemicals and rubber. It is estimated that for each euro of value added by the automotive industry itself, supporting industries generate approximately € 2.7 of additional value added.

Sector-related services

According to CECRA (the European Council for Motor Trades and Repairs), the automotive aftermarket consists of approximately 665,000 companies, the vast majority of which are

[3] Original Equipment Manufacturers: companies which manufacture and/or assemble the final product

small and medium-sized enterprises (SMEs). The sector employs approximately 3.5 million people, serving a total of 260 million vehicles in the EU (passenger cars, trucks and buses) and provides around €82 billion worth of components (spare parts, tyres, accessories, etc.). European motorists spend around €140 per year on components and services for passenger cars.

The aftermarket

This market can essentially be divided into three areas:

1. Customer services, repair and servicing: This category includes manufacturers' own service structures (sales and after-sales service), contractual partners which are directly dependent on the manufacturer (general importers, authorised repair workshops, etc.), and also independent workshops. These include both general workshops as well as those specialising in specific areas. Workshops that specialise in specific components also act as suppliers to the automobile industry in some cases.

2. Spare parts: In the first instance, spare parts are manufactured and delivered by the vehicle manufacturers themselves, or by their suppliers. A growing proportion of parts, however, are no longer sold in the form of original spare parts, but as replicas. There are also a number of generic spare parts that do not carry the brand name of any particular manufacturer (tyres, wheel rims, batteries, spark plugs, filters, lamps, etc.)

3. Accessories and tuning: This includes more or less all parts or components that improve the individual design, comfort or security of the vehicle, and covers many disparate items, ranging from complex electronic or hydraulic components (such as GPS navigation systems or chassis) to simple plastic items (for example, cup holders).

Finally, the automotive industry is also involved in providing and arranging financing services to its customers (automotive banks).

Vulnerability to financial crisis

The car industry is experiencing a very difficult market environment at the moment. In late 2008, the ongoing financial market crisis had reached the mainstream sectors of the economy and the vehicle market was exposed to the downturn very early. Given that motor vehicles are one of the most important consumer goods in terms of total household expenditure, the demand for cars is closely correlated with the general business cycle.

General access to credit plays a particularly important role in the automotive industry, as between 60% and 80% of new private cars in Europe are purchased on the basis of credit financing (often involving automotive companies themselves). Tightening credit conditions combined with their impact on asset prices (particularly house prices, significantly affecting the consumers' perception of wealth) and the uncertainty created by the global economic environment has translated into difficult access to credit and low consumer confidence, which in turn has a highly detrimental impact on the vehicle market. The current economic situation is therefore having an adverse impact on the sales of new vehicles both in Europe and in 3rd countries. Managing production capacity is one of the key challenges in the automotive industry and falling demand is putting pressure on capacity utilisation and subsequently employment. This is not only a challenge related to the current economic situation: investments in production facilities in the new Member States and increases in productivity

have already led to significant excess production capacity in vehicle production. There is also a knock-on effect on automotive suppliers as the impact on the economic crisis moves along the value chain. Suppliers are particularly exposed to the current crisis in the automotive sector due to their close links to vehicle manufacturers, smaller size, lower diversification and their substantial role in vehicle production (around two-thirds of a car is produced by suppliers). Typically, when a vehicle production site cuts capacity, suppliers often have little choice but to follow suit.

The Commission has indentified the automotive sector as requiring strong policy response and presented the policy levers for alleviating the crisis already in the European Economic Recovery Plan[4] in November 2008. This policy response was later developed and detailed in the Communication "Responding to the crisis in the European automotive industry"[5] in February 2009.

[4] COM(2008) 800
[5] COM(2009) 104

3. BIOTECHNOLOGY

Basic facts and figures on the sector

The European biotech industry employs appr. 100 000 people in dedicated biotech firms, and probably much more than 400 000 people in firms partially active in biotech R&D (OECD[6]). The dedicated biotech firms generate appr. €22 billion in revenue and spend about €8 billion in R&D (Critical I survey[7]).

Leading European countries in biotechnology, in terms of number of companies, are Germany, France, Netherlands, Sweden, Denmark, and the UK. According to the most recent OECD survey (2009), there are 3 377 biotechnology firms in the European Union, compared to 3 301 in the United States and 1 007 in Japan. Although the OECD surveys biotech firms worldwide, it suffers from a lack of data from several key countries, including the UK. The problem with inconsistent statistics for the biotechnology industry has been raised repeatedly (including by the Commission) over the last years, but still no progress has been made in providing harmonised national figures.

According to Ernst&Young's 2009 biotechnology report, there are 1 836 dedicated biotech firms (public and private) in Europe compared to 1 754 in the US. The methodology differs from that of the OECD.

Competitiveness assessment

A short analysis of the three main branches of biotech is provided here:

- **Healthcare biotechnology** accounts for the largest number of biotech companies in Europe, as well as in the US. Biotech-derived medicines account for 11% of all products in clinical trials in Europe (12% in the US). The European biopharma sector benefits from the updated regulatory framework for pharmaceuticals in 2005, the improved functioning of the European Medicines Agency (EMEA), and the specific measures in favour of SMEs. The main obstacle to an expansion of R&D activities and company growth is a long-standing financing gap in Europe. Companies are held back both in the early start-up phase and in the later product development phases, as risk-capital investors are becoming risk-averse and avoid biotechnology investments. Since biotech depends largely on venture capital, the lack of a developed European venture capital market prevents company growth in Europe. Measures to improve the risk capital supply are needed at European and national level.

- **Industrial biotechnology** has a strong base in Europe due to the size of the chemical industry. Biochemistry has advantages over traditional chemical processes, such as a reduced environmental impact, improved process efficiency, fewer modification and purification steps, and lower production costs. End products can also be given improved or novel characteristics (e.g. bioplastic can be truly biodegradable). The uptake of industrial biotech methods must be supported by a clear political strategy, favourable economic and regulatory conditions, and a stimulation of key technological capabilities.

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6 OECD (2009) The Bioeconomy to 2030: Designing a policy agenda

7 EuropaBio: Biotechnology in Europe: 2006 Comparative study

- **Agricultural biotechnology** provides several types of applications used in agriculture, such as marker-assisted selection of plants with high yields, biological insecticides used in biodynamic agriculture, and plants with gene insertions that protect against toxic fungi, insects and weeds. The problems with long delays in authorising genetically modified organisms have led to decreasing investments into agrobiotechnology research and a delocalisation of private R&D to countries outside Europe; this is true both for public and private investments. The emergence of new competitors, particularly in the Asia-Pacific and South American regions, will put European competitiveness under even more pressure in the future. This is particularly alarming, since plant science discoveries are also key to developing industrial-environmental applications that may become the next booming branch in the future.

R&D and Innovation - Knowledge and skills

Europe's research and knowledge-building are overall world class:

- In the discovery of new medicines, diagnostics, vaccines, and the understanding of diseases, biotechnology provides the new R&D tools. The majority of innovative medicines, whether traditional small molecule medicines or manufactured using biotechnology, are developed or produced using biotechnology.

- In the area of industrial biotechnology and environment-oriented biotech, Europe has a strong knowledge base with many established companies active in this area, not least the big chemical companies and specialised major biotech firms. The established companies are joined by new entrants, also SMEs, specialised on industrial biotech or bio-based products.

- In the area of agro-biotechnology and plant science, Europe has a valuable knowledge base, but many investments have been moved outside Europe, because of the perceived uncertainty surrounding GMO authorisations. The knowledge base in plant science is closely linked to other applications, such as industrial biotech and environmental applications, there is a real risk that decreased investments in agro-biotech will influence the knowledge base negatively in Europe.

Market Structure

The market for biotechnology products is composed of a small number (probably fewer than 100) of large multinational companies with European headquarters or important European presence and a large number of European-based small and medium-sized companies (appr. 2000 companies) dedicated to the development of biotechnology products. Many of those do not yet have any products on the market that generate significant revenue streams, thus making them vulnerable to inadequate access to finance.

In terms of number of companies the leading European countries in biotechnology are Denmark, France, Germany, Netherlands, Sweden and the UK. The number of firms doubled during the mid-90s amid a surge in discoveries and investments in biotechnology. In the years 2001-2009 there have been both new start-ups and consolidations (acquisitions and mergers of existing companies). Both the EU and the US have more than 3300 biotechnology firms, though the statistics do not give a completely reliable picture, given the rapidly changing

nature of this sector with above-average market-entry and market-exit rates. The European companies are generally smaller in size and grow at a slower pace.

It is possible to identify many scientific and company clusters in Europe, which play a role in connecting people and resources in the sector. As for geographical distribution, biotech companies are present across the whole continent but often concentrated to existing clusters.

Competition

Europe excels at new company formation, but the total number of companies has fallen somewhat since 2001 because of mergers, acquisitions and insolvencies. An on-going consolidation process and a more mature pipeline of products under development have made European companies stronger, but many still suffer from insufficient risk capital.

In healthcare biotech, public companies increased the product pipeline by 10% to over 1000 products in 2008, 157 of which are in late-stage development (phase III). This means more new drugs will seek marketing authorisation and be placed on the European and world markets.

In addition, generic biotech drugs, so-called "biosimilars", are an interesting business opportunity. The EU's new legislation on biosimilars (the world's first) will provide a pathway for the approval of these drugs. In the coming years, the patent protection of many biotech medicines will expire, opening up for generic producers, increasing competition and putting more pressure on prices.

The degree of competition in biotech in the EU Member States depends on the research and business environments. Successful innovation policies and funding schemes have created scientific excellence in several countries, but it is far from being achieved everywhere.

A lack of competition in certain therapeutic areas may be caused by decreased access to finance, especially for SMEs. An underdeveloped European venture capital market and the fragmentation of financial markets are two likely causes.

Regulation

The main challenges are to develop and implement a timely, science-based regulatory framework, which will accompany biotech applications, without creating unnecessary burdens on industry, in particular on SMEs. Healthcare biotechnology and agrobiotechnology are already regulated to a large extent, offering a coherent legislative framework for authorisation and marketing:

- Healthcare biotech is the dominant branch, and more than 250 million patients have benefited from approved biotech medicines (treatment of heart attacks, multiple sclerosis, breast cancer, cystic fibrosis, leukaemia, metabolic diseases, etc). The Regulation on the European Medicines Agency and its SME office are helping biotech companies to get through clinical trials and get marketing authorisation. The new Regulation on advanced therapies (gene therapy, cell therapy and tissue engineering) is a major achievement and creates a uniform European authorisation procedure. However, the difference between formal marketing authorisation and real access to markets (after having obtained decisions from national authorities on the price and reimbursement of the medicinal product) means

that companies can lose valuable time and money because of slow public authorisation procedures.

- A stringent regulatory framework on genetically modified organisms (GMOs) exists at the European level. The EU started legislating on GMOs in the early 1990s. The main regulations are Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms, Regulation (EC) No 1946/2003 of the European Parliament and of the Council of 15 July 2003 on transboundary movements of genetically modified organisms, and Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms. Key issues are to ensure a uniform application of the regulatory framework in all Member States and to address national safeguard measures to evaluate whether there is scientific justification for such measures.

Environment

Industrial biotechnology and bio-based products offer new ways to reduce the environmental impact of industrial processes and products in many sectors. There are many products already on the market, including bio-based plastics, fibres, lubricants, and so on. Enzymes and amino acids are used for food processing and in other biochemical processes, but also in medicinal products.

European companies are world leaders in the use of enzymes to manufacture chemicals, such as eco-efficient enzymes in the production of washing powder, which reduce the consumption of water, raw materials and energy. Biochemical solutions can reduce the resource consumption, energy consumption and waste generation, thus providing environmentally sustainable alternatives to chemistry.

External competitiveness

Europe entered the field of biotechnology later than the US. Since a long time is necessary to develop biotech products, Europe still has a long way to go to catch up with the US, and new competitors emerge quickly, particularly in the Asia-Pacific region (China, India, Korea, Australia, New Zealand, etc). Concerns have been expressed as to the long-term competitiveness of the European biotech industry, unless European authorities make a coherent effort to support its development and growth.

In the US, biotechnology firms are concentrated to certain clusters or regions, where they can grow strong in a favourable environment. Europe has a few strong clusters but is overall trailing behind the US in this important respect. Several projects funded by the Commission aim at improving and strengthening biotech clusters and to make clusters in different parts of Europe cooperate better.

The number of medicinal products in late-stage clinical trials has continued to grow over the last few years until 2009. There are in total more than 1000 product in clinical trials (Ernst&Young 2009) by European firms. The hope is that a large number of products will be available on the markets soon, generating important revenues that can be reinvested in R&D.

Employment and geographical dimension

Total employment depends on the definition of a "biotech company". According to the Critical I report the European biotech industry employs appr. 96,500 people. The sector is highly research-intensive with 44% of employees involved in research and development functions. The geographical distribution is very uneven, with Denmark, Germany and the UK at the top: employment exceeds 15,000 people in each of those countries.

Areas of growth (within the sector)

The main growth areas in the future are expected to be found within the following product segments: biopharmaceuticals (including recombinant proteins, therapeutic enzymes, cytokines, interferons, and monoclonal antibodies), gene therapy, cell therapy, tissue engineering, vaccines, diagnostic tools, industrial enzymes and living micro-organisms for industrial processes.

Response to structural change

Due to the high development costs and the stringent regulatory framework, biotechnology research organisations and businesses are constantly under pressure to rationalise their research and development, to find new ways to the market and to build viable business models.

The sector has responded to structural change in the 2001-2009 period by consolidating businesses through mergers and acquisitions, partnership agreements and strategic alliances. There is also a much closer focus on final product development and market introduction, rather than early-stage research.

As the biotech industry in all areas (healthcare, industrial processes, agriculture) is highly knowledge-intensive, the companies are usually responsive to structural change and dynamic in their choice of strategies.

Structure of sector

As mentioned in the first section of this analysis, biotechnology is a very broadly applied technology, encompassing a variety of industrial sectors. Biotech is used in order to produce biopharmaceuticals and other health applications, in industrial processes, in agriculture, in the agro-food industry, and in various environmental applications including environmental remediation.

Rather than just looking at dedicated biotech companies, the structure of the sector is best described by examining how biotech is being applied across industries and businesses, and the important economic contribution that biotech offers today.[8]

Sector-related services

Biotechnology companies are often involved in contract research and also offer services in biomedical analysis. The revenues generated by these activities are often essential for the survival of the companies and for the funding of R&D activities.

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[8] Further reading can be found in the Bio4EU study "Consequences, opportunities and challenges of modern biotechnology for Europe" (April 2007) on the Commission's web page: http://ec.europa.eu/enterprise/phabiocom/docs/eur22728en.pdf.

The selling of products such as biomedical equipment for analysis and research can be offered in conjunction with support services and other products (supplies and consumables).

4. CEMENT[9]

Basic facts and figures on the sector

The European cement industry employs about 56,000 people, and its output has been climbing steadily in recent years, rising by 23% between 1998 and 2007. Total tonnage produced in EU 27 in 2006 amounted to just over 267.1 million tonnes, with a value of €19 billions. Output in 2007 is estimated to have reached 272 million tonnes. This represented approximately 0.5% of total value added and 0.25% of employment in total manufacturing. Demand for cement is cyclical, depending entirely on building and civil engineering requirements. The production process is a highly energy intensive one, with energy costs generally considered to be between 30 and 40% of total costs, although this situation has probably changed with the recent surges in energy prices. Kilns which produce clinker, the intermediate product in cement manufacture, represent a very high, long term investment which makes it difficult to respond to short term fluctuations in demand or comply with new legislation affecting energy or emissions.

Competitiveness assessment

The *strengths* of the EU cement industry are the following:

- the majority of producers operate on a global level, which gives them access to global best practices and technologies;
- because cement is a product which under normal circumstances is not traded on land over long distances due to the high transportation costs (this does not apply to distances by sea or waterways), the industry is close to its markets. This means that it can offer good customer service and is often able to react quickly to changes in demand;
- production technologies are the best possible in terms of environmental performance;
- raw materials are extracted mainly on-site, which avoids unnecessary transportation and the costs and environmental damage which that could cause;
- cement plays a significant role in reducing overall environmental impact because it uses carefully selected wastes from other industrial processes as secondary raw materials or alternative fuels, for which other disposal solutions would have to be found, and these might be more environmentally harmful;
- the cement industry actually played an essential role in various Member States, e.g. in disposing of animal remains at the height of the outbreak of mad cow disease;
- the workforce is well trained and experienced;
- the industry provided high levels of employment in local areas thanks to a wide network of indirect jobs and activities related to the main manufacturing process;

[9] NACE 26.51

- the EU cement industry's interests are well represented at national and European level;
- the cement industry has become much more conscious of its image in recent years and has been making efforts to improve that image;
- industry is making great efforts to promote itself in such a way as to ensure that the significance of its contribution to society is appreciated.

The *weaknesses* of the cement industry are:

- its high energy consumption, with energy costs accounting for over one third of total production costs;
- it is capital intensive with the cost of laying down a cement production plant equivalent to around 3 years' turnover;
- cement kilns represent very long-term investments, which means that it can be difficult for producers to comply in the short term with legislation affecting energy or emissions, for example, depending on the stage in the life cycle of the kiln. As such there is an acute need for legislative stability;
- the cost of compliance with environmental legislation can be very high;
- the industry has reached a level of performance, which in many cases cannot be improved upon with current technologies, and therefore further major improvements at the production stage are unlikely in the short term;
- whilst huge improvements in environmental performance have been achieved over the years, the cement industry has traditionally suffered from an image problem, with certain environmental bodies in particular still regarding it as a major polluter that produces cement with little regard for the effects it has on the environment;
- the EU cement industry is in competition, especially around the periphery of the EU, with other countries, which do not conform to European quality standards, or European standards on energy use, environmental monitoring, or working conditions.

Opportunities for the European cement industry include:

- increase in the use of wastes as alternative raw materials and fuels;
- development of new products, some with a very positive environmental impact, as in energy-efficient and CO_2-efficient buildings;
- adaptation to climate change;
- market opportunities for cement-based products;

Possible *threats* to the cement industry are:

- competition from imports sourced from economies outside the EU with no carbon constraints;

- high energy costs, especially electricity costs as an indirect effect of climate change legislation (higher than in competing companies);

- relocation of investments outside the EU.

R&D and innovation

Research and innovation needs to be pursued in order to promote new cement production technologies (replacing clinkers, carbon capture etc). Further innovation also needs to be fostered in the field of energy such as the example of new co-processing technologies involving the use of combustible waste.

As in many industries, research in the cement industry is a highly competitive issue that is therefore left to individual companies, which may therefore gain a competitive edge. However, in environmental and health related matters, research is often undertaken collectively. ECRA, the recently formed European Cement Research Academy, has engaged in research on Carbon Capture & Storage (CCS), for example. Pre-competitive research undertaken to enhance the competitiveness of the sector as a whole is being developed by CEMBUREAU and national cement associations in areas such as Environmental Product Declarations, measures to regulate POPs and mercury emissions (cooperation with WBCSD); other areas include the potential impact of cement on workers health, fire performance of concrete, Life Cycle Initiatives, Eurocodes, etc. Universities and other research institutions throughout Europe are often commissioned to carry out this work. However, R & D in the cement industry is leading to the introduction of new products, including some that have a positive environmental impact. Moreover, the cement industry has initiated R & D on carbon capture and storage. More work and standardisation is needed for the use of natural minerals as additions (up to 80% in some cases) to the clinker used in cement production. Nanotechnology is expected to open up new avenues in cement production and use.

Knowledge and skills

The cement production process is at a mature stage, and no further revolutionary technical developments are likely in the short term. Nonetheless, further developments are expected in relation to the environment, such as emissions abatement through the substitution of fossil fuels and materials with wastes and increased use of industrial by-products as raw materials.

Market structure: Competition

The cement industry is highly concentrated, with the five biggest companies holding about 60% of the EU market share. Consolidation is high, and many of the companies are multinationals. Most of the companies are vertically integrated upstream as they quarry their own raw material and process it up to the final product, as well as downstream into concrete. Capacity utilisation in 2006 was estimated at 86% in EU15, and slightly lower at 83% in EU27. There is thought to be no over-capacity in the industry. Since 1990, the Commission has approved eight mergers, none subject to remedies. The Commission so far found one cartel case in which fines were imposed in 1994 on all European producers and their national and European associations. The total amount of fines was reduced by the Court of First Instance in 2000 from € 248 million to € 140 million. Further cartels have been sanctioned or are investigated by national competition authorities, e.g. in Germany, where five companies were fined € 660 million in 2003 (in 2009, the Higher Court in Düsseldorf reduced the fine by

half). In November 2008 the Commission started investigation a further alleged cartel in the European cement industry.

Market structure: Regulation

There is only one piece of European legislation directly affecting the cement industry: namely Directive 2003/53/EC of the European Parliament and of the Council of 18 June 2003 amending for the 26th time Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate and cement). The Directive stipulates that cement may not be placed on the market or used as a substance or constituent of preparations, if it contains more than 0.0002 % soluble chromium (VI) of the total dry weight of the cement, for manual activities, where there is a risk of contact with the skin, such as brick laying, floor construction, tile laying, or maintenance and repair work. It must be noted that this Directive in now integrated into REACH (see below). Other legislation affecting the cement industry is of a horizontal nature, covering the environment, social and employment issues, and the internal market (under the provisions of the Construction Products Directive, EN 197-1: 2000, the European standard for common cements covers 27 products in the family of common cements.

Environment

The principal pieces of European environmental legislation affecting the cement industry are:

- Directive 2008/1/EC concerning integrated pollution prevention and control
- Directive 2000/76/EC on the incineration of waste
- Directive 2003/87/EC establishing a scheme for greenhouse gas emissions trading within the Community
- Directive 2006/21/EC on the management of waste from the extractive industries (mining waste Directive)
- Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency.

Because the cement sector is highly energy intensive, and because CO_2 emissions result from the mineralogical transformation process used in cement production, as well as from the use of energy, the industry has every incentive to reduce its energy consumption, and environmental concerns are of paramount importance. Although committed to reducing CO_2 emissions, the industry's main concern is the carbon constraint unilaterally imposed on European industry, and its impact (both direct and indirect through electricity prices) on its costs. Besides CO_2 emissions, the cement industry's main emissions are NO_X, SO_2 and dust. Dust abatement technology has been widely applied for many years and SO_2 is a plant-specific issue. NO_X abatement has taken off in recent years, with more than 100 SNCR (selected non-catalytic reduction) installations in the cement industry. Some plants have installed primary measures to improve clinker quality, thus reducing energy consumption and emissions to air.

The cement industry is one of the big industrial CO_2 emitters worldwide and contributes 5% to total emissions. Since cement production is increasing, it is expected that this trend will

continue in the coming years. In this context, the cement industry needs to define actions to reduce CO_2 emissions and thus make its contribution to the fight against climate change.

Following the adoption of the emissions trading scheme with the aim of reducing CO_2 emissions in a cost-effective way, the EU cement industry fears being put at a severe disadvantage compared to third country competition. For this reason, an evaluation of the risks of carbon leakage is being carried out. The possibility of industry world-wide achieving an agreement in the area of CO_2 emissions is being explored by industry and might provide a level playing field to avoid the risks of carbon leakage.

Soil-protection policies are an important issue for the industry, since soil has to be removed as a primary step to the quarrying of limestone, but is usually saved for use in quarry restitution. Access to raw materials and the complex permitting system for planning and extraction are also important issues. The BAT reference document was adopted in December 2001 under the provisions of the IPPC Directive, and has to be taken into consideration when the permit conditions based on best available techniques are determined. The cement & lime BREF is currently under review.

External competitiveness

Cement is a high-density product with a relatively low selling price, so transport costs have a determining influence on trade. In 2007, 3% of production was exported outside the EU, whilst non-EU 27 imports supplied 7% of consumption. Traditionally, the main destination for EU 27 cement and clinker exports has been the USA, because of its volatile domestic demand. Imports, three-quarters of which are clinker, come mainly from far eastern Asian countries, like China, Thailand, and the Philippines. Where European cement producers have identified demand for cement in non-EU countries, they have generally invested in manufacturing sites in those countries. As such, EU companies now own almost 60% of US production capacity, and have significant production facilities in the rest of the world. Investments in carbon-constrained Europe have fallen away dramatically.

Employment and geographical dimension

Cement is produced in all EU Member States, except Malta. Employment in the sector has decreased steadily in recent years, with employment estimated at 56 500 (EU 27) in 2006.

The sector is a low labour intensity sector. Health and safety at work is the main concern for workers. The average life expectancy of a cement worker is about 62 years. There is a need to identify sector-specific social partners who will ensure social dialogue between industry and employees.

Growth areas (within the sector)

World demand for cement has been growing at an average rate of over 8% p.a. in recent years. In the mature EU market, demand grew by about 1.8% in 2007 overall, but with considerable variations between countries. Fuelled by the demand linked to development and infrastructure, growth rates of some 10% or more have been seen in some of the new Member States. Even in highly developed countries, adaptation to climate change will require a lot of cement for many applications in concrete structures such as dams, dykes, and flood barriers for example. Infrastructure works, which reduce traffic congestion and energy efficient

concrete buildings by their thermal mass, should help combat climate change and lead to increased demand for cement.

Response to structural change

There has been a considerable amount of restructuring in the EU cement industry over the years, and significant investments have been made outside the EU. Because cement is a product which is not regularly traded over long distances, EU cement producers, where they have identified market opportunities, have made acquisitions or invested in capacity in those markets. This happened in the 1970s and then again in the mid 1980s, when production facilities were acquired in North America. These moves were followed by acquisitions in Latin America in the late 1980s, followed by a third wave of acquisitions from 1989 in central and eastern European markets.

Structure of sector

Europe is the second largest cement producer in the world after China. Three out of five of the biggest groups operating at world level originate in the EU (four if the EEA is considered). In addition, a further 10 large groups or family-run companies also currently operate in the EU. In Germany, Italy and Spain, there are some small plants which are not owned by listed companies. The EU cement sector is made up of 149 companies, with 359 plants currently in operation, of which:

- two produce only clinker
- 89 are grinding and mini-grinding plants
- 268 are integrated plants producing and grinding clinker on site.

Sector-related services

As in the case of many other industries, the European cement industry outsources some services such as maintenance, laboratories, etc. to external firms, but there is no overall pattern. The impact of the European cement industry on suppliers of sophisticated equipment and services is far greater. European equipment suppliers to the cement industry together account for 65% of the world market (excluding China). The world market is supplied from their European base. The cement industry does provide environmentally favourable solutions. One clear example of this is the use of waste as an alternative fuel and an alternative raw material (such as slag from the steel industry) in the cement manufacturing process. Without this, other more environmentally harmful solutions – such as landfills and incineration – would have to be found to dispose of this waste.

Vulnerability to financial crisis

In a deteriorating global economic environment, driven by a severe financial crisis, the main uncertainties for the cement industry stem from: higher costs of capital and reduced access to credit, difficulties in planning access to capital, significantly reduced demand from the construction sector on which the EU cement industry is totally dependent and where demand has fallen in most Member States. Although there are differences between Member States, depending on the maturity of the market, a significant decrease or a slow-down in activity has been recorded.

Cement is a commodity product with relatively high transport costs and so is not commonly transported over long distances (+/- 200km at most). However, as producers in non-EU countries see their domestic demand falling, there has been a significant increase in competitive pressures in the EU as producers in third countries look for buyers for their surplus production, or invest in new facilities to export to the EU. In addition, the reduction in dry bulk sea freight costs, which have fallen dramatically (down almost 90% from their peak in May/June 2008), has made it much more attractive to import from abroad.

Although there are significant differences between what is happening in the various Member States, provisional figures for overall EU 27 cement production suggest that it is currently between 5% and 10% down on the level of 12 months ago, at a time when not only are imports of cement increasing, but trade between Member States is also on the rise. Also, imports of clinker rose significantly in 2008 in the wake of high CO_2 prices, to the extent that, in one Member State at least, 35% of all cement was being produced from cement imported from China. The latest figures suggest that imports of clinker are slowing, in the light of a slowdown in demand for cement. The only investments that seem to be being made at the moment are in clinker grinding plants, not in cement production as a whole. In fact, certain investments in the EU have been cancelled.

5. CERAMICS[10]

Basic facts and figures on the sector

The European ceramics industry is made up of several distinct sectors, manufacturing products for a wide range of uses, ranging from consumer durables to applications in the construction industry. The sub-sectors are wall & floor tiles, which accounts for just under 40% of the total value of 2006 output, bricks & roof tiles, table- and ornamental ware, refractory, sanitary ware, technical ceramics and - the smallest sub-sector - vitreous clay pipes. Total output in 2006 (EU 25) is estimated to have reached €28.1 billion – almost 3% higher than the previous year, continuing the recent trend of limited ongoing growth. On the other hand, employment figures continue their steady downward trend, edging down to about 221 000 jobs in 2006 (EU 25), just over 2% down on 2005. The manufacture of ceramic products is a very energy intensive process, with the cost of energy in total production costs estimated at around 10% in the labour intensive tableware sector, and at over 30% for bricks and roof tiles. With the recent surge in fuel prices, the proportion of energy costs in this latter market segment now stands at 50%. The industry has made significant efforts to reduce energy consumption, achieving a cut of over 50% since the 1980s. However, the scope for further big reductions is limited. The ceramics industry is being examined for possible carbon leakage in the third phase of the greenhouse gas emissions trading scheme. The industry is also capital intensive. Kilns represent a very expensive long lasting investment, which makes it difficult to respond to short-term fluctuations in demand, or comply at short notice with new legislation affecting energy or emissions.

Competitiveness assessment

The *strengths* of the EU ceramics industry are that it is a world leader in producing value added, uniquely designed, high quality ceramic products manufactured by flexible and innovative companies, mainly SMEs. These are able to react quickly to changing market demand and new opportunities. The use of automation and environmental technologies is widespread and the existence of clusters is conducive to product and process innovation and enhanced competitiveness.

Its *weaknesses* are its low flexibility of volumes of production, especially in the bricks and refractory sectors, high sunk costs, high barriers to entry, and problems with counterfeiting and difficulties for SMEs to take action in this regard. The production technology is mature, and there is only limited scope for improving energy efficiency and reducing emissions. The industry has an image problem of being a dirty sector, and is experiencing difficulties in some areas in attracting skilled, technically competent workers. Some sub-sector products are heavy, which increases product costs and can reduce access to customers. Substitutes such as carpets and paint are easier to install than wall and floor tiles.

The *opportunities* include the industry's specialisation in high value added products, access to new markets appearing in emerging economies, its closeness to the market place and the ability to offer just-in-time and just-to-market service, increasing R&D in technical ceramics,

[10] NACE 26.2, 26.3 and 26.4

smart materials, use of lasers, greater process automation, labelling and communications advantages – such as certification systems, origin marking and eco-labelling.

The *threats* include the big increase in cheap imports from emerging economies, the serious competition in mass volumes of low-cost products from China, especially tableware, the surge in energy prices, reliance on virgin raw materials from third country producers, trade barriers in the form of either high tariffs (USA) or testing and certification schemes, lifestyle changes and substitution by other products, IPR infringements, dwindling workforce, and high levels of environmental and social regulation compared with the principal overseas competitors, especially China.

R&D and innovation

Given that the ceramics industry is at a mature stage, R & D and innovation have been crucial, and continue to be of paramount importance to the industry. The picture of investments made by ceramics producers is very diverse, but overall it is estimated that EU ceramics manufacturers invest something like 5% of turnover in research and related areas on average. The single biggest innovation of the second half of the 20th century has been the switch to single firing where technically possible, and the area in which most progress has been made is that of technical ceramics. From the simple production of insulators, the sector has developed a vast range of products going into applications which include electronics and the chemical, mechanical, bio-medical, aerospace and automotive sectors. Product innovations have been successful in most ceramics sub-sectors, including the automation of tableware processes in terms of design and flexibility of production, the use of lasers in the decoration of tiles, the development of refractory for use in very high temperature applications, the production of unfired clay blocks for load bearing masonry and the development of special glues in masonry.

Knowledge and skills

Ceramics manufacturing technology is at a mature stage; production is highly automated in most sectors, although it can be very labour intensive in some tableware branches. Access to skilled labour is often difficult and is likely to be a bigger challenge in the future with a declining workforce and competition for skilled labour in other industries which may have a better image.

Market structure: Competition

The ceramics industry in the EU includes a large number of SMEs. However, a large proportion of the production is geographically concentrated and derives from a relatively small number of large companies or consortia. At the heavy end of the product range, such as bricks and roof tiles and refractories, vertical integration is normal, with producers typically having their own quarries from which they mine their clays. Conversely, producers of finer ceramics such as tableware and wall & floor tiles normally get their clays from dedicated clay producers, and some are vertically integrated in that they have their own retail outlets. The number of operating companies does not fluctuate a great deal, although there have been a number of closures in recent years, especially in the tableware sector. In terms of mergers, the Commission has approved 15 over the years, only one with remedies. There have been complaints about state aids in the past, mainly in the Spanish tableware sector. There have never been any cases of market and price fixing.

Market structure: Regulation

There is only one piece of European legislation directly relating to the ceramics industry, and that is Directive 84/500/EEC on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs, as amended by Directive 2005/31/EC as regards a declaration of compliance and performance criteria of the analytical method for ceramic articles intended to come into contact with foodstuffs. Other European legislation concerning the ceramics industry is of a horizontal nature, and has to do primarily with environmental and employment issues.

Environment

The following environmental legislation covers the ceramics industry:

- Directive 94/42/EC on packaging and packaging waste
- Directive 2008/1/EC on integrated pollution prevention and control (IPPC)
- Directive 2003/87/EC establishing a scheme for greenhouse gas emissions trading within the Community
- Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation, and restriction of Chemicals (REACH)

The issues related to environment are:

- energy intensity
- particulate matter or dust can arise from the handling or processing of raw materials or finishing. Gaseous emissions arise during the firing or spray drying of ceramics and may be derived from the raw materials and/or the fuels used. Among these emissions are carbon oxides, nitrogen oxides, sulphur oxides, inorganic fluorine and chlorine compounds, as well as organic compounds. Heavy metals can also be emitted due to the use of substances used in decoration or to the use of heavy oil as fuel;
- some of the waste arising from the production process can be recycled back to the kiln, and that which can not be recycled internally is sent for external recycling (e.g. road construction) or disposal (e.g. landfill). Some producers are beginning to bring in waste for recycling, but this is by no means common, as it is, for example, in the glass industry, and there is no standardised collection system;
- waste water coming from the production process mainly contains mineral components (insoluble particulate matter, albeit not discharged). Depending on the production process, it may also contain other inorganic materials, small quantities of numerous organic materials as well as heavy metals;
- the principal issue for ceramics is the use of lead and cadmium for decoration in the table ware and ornamental ware sector. This is regulated by Commission Directive 2005/31/EC, which introduces a requirement for a written declaration by the producer or importer that the goods placed on the market comply with the lead and cadmium release limits;

- REACH has an impact on the ceramics industry because it entails extra requirements linked to the communicating on safety of chemicals used along the supply chain, and it may be that some small quantities of chemicals that it uses in components such as glazes will disappear from the market rather than being registered, etc.

- following the adoption of the emissions trading scheme aimed at reducing CO_2 emissions at least cost, the EU ceramics industry fears that it may be put at a serious disadvantage compared to third country competition. For this reason, an evaluation of the risks of carbon leakage is being carried out. The possibility of industry world-wide achieving an agreement in the area of CO_2 emissions might create a level playing field to avoid the risks of carbon leakage.

External competitiveness and trade issues

Bricks, roof tiles and vitreous clay pipes, with high weight and low price, have local or regional markets, whereas tableware and wall and floor tiles are traded over long distances – more than 25% of the output is exported outside the EU.

The USA is prominent as the biggest export market, making up for approximately 25% of exports , followed by Russia (10%), other European countries (Switzerland and Norway) with 10%, and Japan, Saudi Arabia, and Ukraine with about 5% each.

The most important source of imports by far is China, with 70% of all imports, a figure which has grown rapidly since 2004, followed by the USA and Thailand.

The ceramics industry faces a significant number of trade issues, encompassing:

- peak tariffs in third countries where EU ceramics manufacturers see potential for their products, as well as in already developed export markets (USA), where they are used more specifically as a trade barrier against EU tableware;

- non-tariff barriers (NTBs) are also widely used. These barriers take the form of compulsory testing, conformity assessment, and certification schemes, special labelling requirements, or the obligation to clear customs at a specific port, which may be far from the main market. These constraints generate additional costs and delays for the industry. As of April 2009, 30 countries including, for instance, Turkey, Egypt, Saudi Arabia, Russia, Ukraine, and Colombia, were using such barriers;

- use of Trade Defence Instruments in third countries: in two cases, enquiries have been launched with a view to the setting up of safeguard measures, although such measures were not justified by any sudden or sharp variation of EU exports to the countries concerned. The two cases are still pending.

It would appear that in some cases, EU industry is a collateral victim of actions mainly undertaken to protect local industry from booming Chinese exports.

Another concern to industry is the supply of raw materials. As far as high costs resulting from anti-dumping duties are concerned, the Community interest test - which is regularly carried out in anti-dumping investigations - ensures that they do not have an impact on the industry's competitiveness. Further concentrations of raw materials suppliers will need to be monitored closely, as more and more raw materials are imported into the EU. This is of vital importance

for the refractories sub-sector, where China now controls up to 90% of the raw materials for some products (magnesia, bauxite).

Employment and geographical dimension

The sector is estimated to have employed 222 000 people in 2007 (EU27), continuing the downward trend that has been a feature of the industry for some time. The continuous fall in employment has to do with increasing automation in many parts of the industry, and the attendant gains in productivity, but there is no doubt that the increase in low-priced imports, especially from China, has had a major impact, and in the tableware sector in particular there have been significant closures. Since 1990, production has gone down by 50%, whilst employment in the sector has been reduced by more than two-thirds. Massive changes in lifestyle and substitution by other products, such as plastic, have also played a major role in this. The EU ceramics industry is geographically concentrated. There are clusters of production in regions such as Bavaria (DE), Staffordshire (UK), Limousin (FR), Sassuolo (IT) and Valencia (ES).

Areas of growth (within the sector)

In recent years the value of output in the ceramics industry as a whole has been growing slowly but steadily, although it is estimated that output has remained stable in the clay pipes sector, and has gone down in the ailing tableware sector. How much of this growth is due to increased demand or to the statistical of successive enlargements is hard to tell, given the fact that it is impossible to obtain reliable comprehensive statistics on this fragmented industry with a high share of SMEs. The areas where there has been growth are likely to have been in those areas where the EU ceramics industry excels on design and quality, such as higher quality tableware, wall & floor tiles, and sanitary ware. Growth in the bricks & roof tiles, wall & floor tiles, and sanitary ware sectors follows very closely what is happening in the construction sector.

Response to structural change

In order to maintain its market position, the ceramic industry needs to exploit its strengths as a producer of high quality products, and there is already evidence of this happening. The increasing strong competition in low cost and high volume imported products will make it hard for EU manufacturers to keep up. Tableware producers in particular, but also wall & floor tile manufacturers, will have to focus more on the high quality range. It is therefore crucial to adopt strategies to identify the ever-changing customer needs, to develop and communicate performing brands, and to fight counterfeiting which is undermining the strong position of EU producers.

Although the industry's manufacturing technology is at a mature stage, with little possibility of further energy savings, the industry must respond to the climate change challenge which entails environmental legislation such as ETS. The industry should make efforts to develop cleaner technologies wherever possible, and to use environmental management systems such as EMAS. The EU ceramics industry must strengthen its competitive position vis-à-vis its competitors, not only on domestic markets but also on third country markets. As many non-EU competitors are not bound by the same environmental and health and safety rules, it is vital for the industry to strive for a level international playing field, for instance on the basis of international agreements to combat climate change. Ensuring better access for EU

producers to third country markets, either through bilateral agreements or through the WTO, would also help to create a level playing field. The ceramics industry needs to improve its image in order to achieve and retain a technically skilled workforce.

Structure of sector

Overall, the EU ceramics industry is made up of SMEs. However, there are some sub-sectors which are highly concentrated, in particular the bricks and roof tiles sector. The sanitaryware sector is also quite concentrated, with well-known companies occupying a strong position on the market. The clay pipes sector is controlled by only three companies. On the other hand, the wall and floor tiles and tableware sectors are dominated by SMEs, often within cooperatives, and often forming regional clusters in order to enhance their skills base and to be able to respond quickly to changing consumer demand. In Italy, for instance, the SMEs which make up the wall and floor tiles cluster are in consortia with suppliers, producers and traders.

Sector-related services

The most important issue is the supply of raw materials, especially for those sectors which are heavily dependent on imports, including certain raw materials for the production of refractory products, most of which come from China. Refractory products are themselves enabling products that are used in a wide range of heat-based production processes and without them there would be no production of steel, glass, cement, etc. Most ceramic manufacturers sell their products to wholesale traders or direct to retailers, although some of the bigger producers are vertically integrated, i.e. they have their own sales and marketing outlets.

Vulnerability to financial crisis

The main effects of the financial crisis on the EU ceramics sector are likely to be associated with the higher costs of capital, reduced access to credit (especially for small and medium sized enterprises, which dominate the sector), lower domestic demand, and weaker international trade growth. The latter will particularly affect the tableware and wall and floor tiles sectors, where up to half of the output is exported in some cases.

A number of sub-sectors will have been affected by the fall in construction activity which is already being seen in some Member States, particularly bricks & roof tiles and wall & floor tiles (demand for bricks has fallen by two thirds in recent months) and sanitary ware. Overall, demand for construction ceramics is expected to fall by 15-20% during 2008), and the forecast for 2009 is even worse, with predictions of an even bigger fall in demand. As public spending is cut, there will be reduced demand for vitreous clay pipes unless Member States decide to invest in public spending projects, and a fall in consumer confidence and spending will also have a negative impact on the tableware and ornamental ware sector. Signs of this were already emerging at the beginning of 2009, with one of the EU's major producers going into receivership.

The ceramics industry is energy intensive, and is therefore very vulnerable to the volatility of fuel prices. In the bricks and roof tiles sector, for instance, which accounts for roughly half of total consumption in the ceramics sector, the cost of energy had climbed to over half of total costs by the second half of 2008. In response to the significant decline in the construction sector in most western European countries, the biggest producer in this sector, the Wienerberger group of Austria, has implemented an optimisation programme aimed at

protecting liquidity and maximising cash-flows. However, its Belgian plant, which is the biggest in Europe, is now working at one third of its capacity.

As with falling domestic demand in emerging economies, it is likely that the competitive pressure on the EU from ceramics producers in these countries will increase as they seek further outlets for their production. China, for instance, has built up its ceramics industry significantly over recent years, and imports of Chinese tableware and wall and floor tiles into the EU have surged recently, especially with the ending of the EU's quantitative restrictions on imports of tableware from China at the end of 2004.

6. CHEMICALS, PLASTICS AND RUBBER[11]

Basic facts and figures on the sector

The European chemicals industry covers a wide field of processing and manufacturing activities. It is a complex industry consisting of five main sub-sectors: Petrochemicals, Inorganics, Polymers, Specialty & Fine Chemicals and Consumer Chemicals. With a turnover of €537 billion (2007, Cefic), the EU is a leading chemicals producing area in the world (29% of world production). The chemicals industry is a high-tech industry which enables numerous innovations in virtually all sectors of the economy and, therefore, directly affects the competitiveness of its downstream user industries. Current prominent examples are information technology, aerospace, medicine, hygiene, nutrition, mobility, housing, energy saving and clothing. Its output includes more than 70 000 products: fertilizers and biocides, paints and coatings, soaps and detergents, perfumes and cosmetics, explosives, plastics, rubber products and many more. It is also closely linked to new developments, such as bio- and nanotechnology.

The chemical companies employ a total staff of about 1.2 million (2007, Cefic). Employment in the EU chemical industry has fallen by 2.1% per annum over the last 10 years.

Competitiveness assessment

The key factors influencing the competitiveness of the EU chemicals industry are access to energy and feedstocks, innovation and R&D and international trade. The EU has a very substantial trade surplus in chemicals (€35.3 billion in 2007). It has a surplus with every main trading region (NAFTA, Asia, Japan, Latin America, Africa, Rest of Europe and Oceania). Between 1995 and 2007 the global market for chemicals grew by 40%, but the share of the EU chemicals industry fell by 4 percentage points from 33.7 % to 29.7 %. The US (- 3.8 %) and Japan (- 7.5 %) also lost considerable market share during the same period, while China's market share rose from 4.3 % to 15 % (i.e. an increase of 10.7 %). The Trade Competitiveness Indicator (TCI), an indicator that compares the trade balance to the total trade (exports plus imports) of a region, reveals that the competitiveness of the overall EU chemicals industry has been deteriorating since 2003; the TCI dropped from 21.6 % to 16.5 % in 4 years.

However, these general competitiveness indicators conceal substantial differences in the situation according to the individual sub-sectors. An analysis of trends (1999 – 2007) in the TCI per sub-sector relative to the EU's main trading partners shows that the EU has recently increased its trade surplus in speciality chemicals with most of its main trading partners, except for advanced chemical producing countries such as US and Japan. The same applies to consumer chemicals and polymers. By contrast, EU trade performance in basic organics (including petrochemicals, fermentation products) is deteriorating. Fertilizers and oleochemicals are the sub-sectors where the EU's trade position is weakest.

In terms of policy making, it is crucial to create an environment (legal, societal, etc.) where innovation is stimulated. Feedstock costs (mostly oil, but with renewables taking on an increasing role) and energy costs are major cost drivers for the chemicals industry, especially

[11] NACE 24 (24.1, 24.2, 24.3, 24.5 24.6, 24.7) and 25

for the petrochemicals sub-sector. As the rubber industry is relatively labour intensive for this sector, labour costs are important too. In 2007 the High Level Group on the Competitiveness of the European Chemicals Industry was established. In February 2009 this High Level Group concluded its activities and adopted 39 recommendations aimed at fostering the competitiveness of the European chemicals industry while contributing to sustainable development. The main recommendations revolve around three key areas: more innovation and research and strengthening networks and clusters; responsible use of natural resources and a level playing field for sourcing energy and feedstock; and the need for open world markets with fair competition.

R&D and innovation

Maintaining competitiveness in the chemicals industry revolves around discovering, adopting and commercialising new chemical substances, preparations and technology. As a result, innovation in the chemicals industry is a key driver of future European competitiveness, with a big impact on innovation in other manufacturing industries. In 2004, R&D spending accounted for 1.8 % of the sales of the EU chemicals industry, which is slightly higher than in the US (1.7 %). However, Japan has a ratio that is around twice as high as the EU's. Japan is the only country to barely show a decline in the ratio between 1995 and 2003. R&D is also growing very strongly in the emerging countries, particularly China and India. The chemicals industry is responsible for about 15% of all filings at each major Patent Office, which is another indicator of the importance of innovation. Clustering, collaboration and the formation of strategic alliances are becoming increasingly important. The need to increase production and capture new markets, while at the same time reducing emissions and improving worker safety, requires major chemical innovations driven by competitive EU chemicals industries and associated industries. If the economic contribution of the industry in Europe is to be sustained, there is a need to boost European research, development and innovation in the field of chemical technologies.

Knowledge and skills

The chemicals industry is a science-based, high technology and very capital intensive industry. Operating chemical plants and processes requires a highly skilled and educated workforce. Certain chemical companies and certain regions have problems finding new, skilled and well trained employees. Various initiatives, in particular at national and regional level, have been introduced in the EU to address this problem with good success.

Market Structure: Competition

Given that the sector produces such a wide variety of products, comprehensive analysis of competition is difficult. Consolidation and restructuring in the chemicals industry are ongoing processes, which will continue in the future. The *Petrochemicals* sub-sector is vertically and horizontally integrated to a high degree, and economies of scale and scope are important. Further consolidation can be expected, as the average plant size in Europe is small by comparison with the new plants that are being built outside the EU. Consolidation is also taking place in the sub-sector *Fine and Specialty* chemicals, which is predominantly composed of specialised niche companies. Further restructuring in this segment is driven, among other things, by the overall business environment and by the degree of access to capital for SMEs. The investment of private equity capital in the chemicals industry is another factor that is affecting the chemicals landscape: this includes selling off units, merging

businesses, restructuring companies, etc. with a view to creating a high return on investment. Whereas, in some cases, consolidation will improve the competitiveness of the chemical industry, in others this development may harm longer-term competitiveness. Buyer power amongst clients from, for instance, the automotive or retail sectors is important too. In general, for commodity chemicals (most petrochemicals and plastics) prices are transparent. Vertical integration is important in the industry, although some major players have decided to get out of commodities and focus on specialty chemicals.

Market structure: Regulation

The main regulatory challenge of the chemicals sector is how to successfully implement a workable and cost-effective REACH system (Registration, Evaluation and Authorisation of Chemical substances). This will ensure a homogeneous regulatory regime in the Internal Market, and the international competitiveness and innovative capacity of the sector, including its SMEs, whilst achieving a marked improvement as regards environment, health and safety standards. Other regulatory issues that have a bearing on the chemicals, rubber and plastics industries include occupational and workplace regulations and most parts of the other existing environmental and health regulations, including the legislation on integrated pollution prevention and control (IPPC), waste, water, climate change and air pollution. A number of product groups are subject to specific regulation, including pesticides and biocides. As the chemicals industry is very energy intensive, the future implementation of the revised European Emission Trading Scheme in particular will have significant impacts. Energy liberalisation in Europe for gas and electricity has been a legislative and business issue for more than a decade, but so far it has not met its objective to deliver energy at competitive prices. Many EU regions still seem to lack truly liberalised markets and genuine competition. In existing oligopolies, industrial consumers are not free to choose suppliers or to negotiate on a fair basis with suppliers.

Environment

Environmental issues play a crucial role in the chemicals industry since the use of certain chemicals has led in a high number of cases to adverse effects on human health and the environment and also a growing presence of chemicals in areas where they have never been intentionally used. This has led to the development of a substantial number of regulatory measures. As a result, environmental expenditure in the EU chemicals, rubber and plastics industries amounts to 3.5% of value added and accounts for 23% of total EU environmental protection expenditure in all industries. The EU chemicals industry managed to largely decouple its growth from the growth of emissions, e.g. emissions of volatile organic compounds. In the past 15 years EU industry has also achieved remarkable progress in energy efficiency. By 2006, production in the EU15 chemicals industry had risen by 67% since 1990, while total energy consumption has decreased and CO_2 emissions were down by 32%. Hence, CO_2 emissions per unit of production have fallen even further.

The chemicals industry is well placed to provide sustainable solutions for a number of major societal challenges (e.g. climate change). The European chemicals industry has some initial competitive advantages in this context.

External competitiveness

In 2007 the EU chemical industry exports outside the region were worth approximately €124 billion. Imports from outside the region amounted to some €89 billion. The balance was worth

€35.4 billion. Despite these figures, the EU's chemicals trade balance evolution shows that the trade performance is deteriorating with certain countries in certain sub-sectors, and especially with some key Asian for almost all sub-sectors: India and China are the two only countries with whom the EU currently has a trade deficit for chemicals in general. Likewise, trade with the Middle East, whose chemical industry focuses on petrochemicals, indicates that this region increasingly uses its feedstock to develop an integrated chemicals value chain and to strengthen its position in a wider range of basic chemicals. Until now, Russia has only been successful in using its competitive advantage as regards raw materials in the area of base chemicals and fertilizers. In relation to the US, Russia and South Korea the EU has an overall trade surplus for chemicals and this surplus is increasing.

From an external competitiveness point of view, the challenges facing the industry are: slow demand growth in Europe, high demand growth in Asia, delocalisation of important customer industries, higher production costs and a highly regulated environment. The EU chemicals, rubber and plastics industries encounter also market access problems in some major export countries, not only in the form of tariffs but also more and more through non-tariff barriers, such as customs nuisances. The European petrochemical and fertilizers industries are also seriously affected by double-pricing policies regarding raw materials of certain third countries rich in energy resources.

Employment and the geographical dimension

Germany is the largest chemicals producer in Europe, followed by France, Italy and the UK. Together, those four countries produce almost two thirds of the EU's chemicals output. Adding Belgium, Spain, the Netherlands and Ireland raises the share to 89%. Poland is the main chemicals producer from the new Member States, accounting for almost 2 % of total chemicals sales. This indicates that the chemicals industry in the new Member States is still rather small in comparison to the old Member States.

Areas of growth (within the sector)

The chemical industry is well placed to benefit from a number of mega-trends which are shaping our future. For instance, the sub-sectors of the chemicals industry that are active in the fields of energy or energy saving (solar panels, insulation, carbon capture) and water purification have enormous growth potential. Electronic chemicals and pharmaceuticals have very good growth prospects too.

Response to structural change

The chemical industry is constantly adapting through mergers and acquisitions, de-mergers and spin-offs, and joint ventures. Private equity players have also become more important in recent years. Evidence of outsourcing and offshoring is difficult to find. The integrated nature of the chemicals industry and its very high capital intensity make the outsourcing and off-shoring of parts of the production process complex and difficult. As a result, short term relocation of production facilities is not a widespread phenomenon.

However, as more and more user industries are emerging in Asia, the chemicals industry is increasingly installing production capacities in this region.

Structure of the sector

The EU chemicals industry consists of about 27,000 enterprises, 96% of which are SMEs generating 30% of sales and 37% of employment (2006, Cefic). The EU rubber industry comprises some 4,200 companies and employs 360,000 people (2006, ETRMA). The EU plastics industry is composed of approximately 50,000 enterprises employing some 1.6 million people (2009, PlasticsEurope). In total, the chemicals, rubber and plastics industries represent about 80,000 enterprises and employ a workforce of around 3.1 million.

Sector-related services

Specialised process-design and engineering construction firms are very important in the chemicals industry. These firms play a crucial role in the development of new and improved processes, as well as in their dissemination. They engineer the majority of the petrochemical plants built all over the world.

Vulnerability to financial crisis

The impact of the financial crisis on the chemicals sector is mainly indirect. Adverse developments in important downstream sectors, such as construction and the automotive industry, have a strong negative effect on the chemicals industry. Consequently, any improvement in these customer sectors and in the economic performance in general, will help the chemicals industry more than direct intervention to help chemical enterprises. On the external front, the most problematic development is the weakening of demand in emerging countries. India and China were expected to be the destinations of the production from the huge new petrochemical capacities in the Middle East. If this increase in demand does not fully materialise, there is a risk that these products will be redirected to the EU market. Such a development could severely hurt the EU petrochemicals industry, with the closure of weaker locations, many of them in Southern and Eastern Europe.

Even before the current economic crisis there was a widely held view that, by the end of this decade, growth rates in the global chemicals industry for some sub-sectors, such as petrochemicals and basic chemicals, would decrease compared to the very strong growth of the last five years. However, the anticipated 'soft landing' for these sub-sectors has become an extremely 'hard landing'. The current massive fall in demand and sales was unimaginable only a few months ago.

The chemicals industry in the EU's new Member States is dominated by basic chemicals, with older and less efficient installations in some cases. Therefore, the current crisis can be expected to hit the chemicals industry in the new Member States harder than in the older ones. Sub-sectors such as fine chemicals and consumer chemicals, which are less cyclically sensitive to the business cycle, are predominantly located in the old Member States.

There is no reason to assume that the European chemical industry will be unable to return to a steady and healthy growth path after the current economic downturn. There are no limits to demand in the solutions that this industry provides. In particular, if the European chemicals industry succeeds in mobilising its innovation capacity, its overall future still looks bright. Nevertheless, because of the severity of the current economic crisis, some structural adjustments will be unavoidable, in particular in the European petrochemicals and basic chemicals sub-sectors.

7. CONSTRUCTION[12]

Basic facts and figures on sector

The construction industry – which consists of construction, renovation, maintenance and demolition of buildings and infrastructures – directly employed around 14.8 million persons in 2008 (e.g. 6.6 % of the EU total employment) and supports about 26 million jobs in Europe. It is estimated that the EU-27 construction industry generated a turnover of €1,590 billion and contributed about 5 % of the EU-27 GDP in 2008. This sector is characterized by a dominance of small and medium sized enterprises, and a very large number of micro enterprises, which produced about 80% of the total turnover of this industry.

Demand in Europe is coming from private households, business society and the public sector alike, with the latter dominating demand for infrastructure works. Residential and non-residential buildings are the main volume stream, with about 80% of the total EU construction output. New construction represents 57% of the total activity. There are, however, significant differences between countries, with a greater demand overall for civil engineering and new construction in the construction activity of EU-12. On average, construction expenditure per capita is 3 to 4 times higher in EU-15 compared to EU-12, but growth rates are steadier in EU-12. Two thirds of the construction activities are concentrated in DE, ES, UK, FR and IT.

Competitiveness Assessment

The construction industry is the biggest sectoral employer and a major contributor to GDP and Gross Capital Formation in Europe. Public regulations and public investment has a major influence on the sector in terms of cyclical stabilisation of macro-economic trends. In recent years, the sector benefitted considerably from the economic recovery in Europe although as early as a year ago signs of a slow-down could be discerned. These were mainly in the new residential housing sector in some Member States, in the wake of stagnating or even declining housing prices. For the coming three years, the overall level of growth in construction value is expected to be below the growth rate of the economy as a whole. In the new EU 12 Member States, public authorities intend to give priority to the development of infrastructure over the coming years, but the volume will depend on the availability of EU funds and general credit as well as the level of foreign investments and opportunities for public-private partnerships to finance projects. While EU support for these efforts seems likely to remain stable or may even grow, there are serious uncertainties regarding the general availability of credit and foreign investment while the current climate for Public Private Partnership (PPPs) initiatives can only be described as "frosty" (a direct consequence of the uncertainties on the credit market). Compared to nearly all other sectors, the seasonality of the work and its labour intensive nature have a much greater influence on the performance of the construction sector. The value-added per person employed in construction is significantly lower than in most other activities, chiefly owing to the limited potential for increased automation and the capital intensity of production. The investment per worker is less than half that of the rest of the industry in most European countries. The only sub-sector with relatively high productivity is the renting out of construction equipment.

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[12] NACE 45.1, 45.2, 45.3, 45.4 and 45.5. The main source of data in this section is Eurostat.

R&D and innovation

The level of investment in R&D is relatively low compared to other sectors, i.e. below 0.3% of construction added value[13]. A major challenge in R&D is to encourage the large number of small and medium-sized companies in the sector to participate in and exploit the developments and findings. For example, ICT provides considerable benefits to the construction sector in many ways, for instance by embedding ICT components in 'smart' materials/construction products, by offering new ways of interaction and coordination in trade/procurement as well as in the construction process itself, by monitoring of material flows, etc. However, it is currently performing well short of its potential due to the relatively low IT penetration at the SME end of the sector. Construction enterprises could also derive considerable advantage from investment in R&D and innovation in intelligent materials, construction techniques, infrastructure management, cultural heritage, hazard management and social sustainability. The current Lead Market Initiative on Sustainable Construction carried out a structured review of the obstacles to and the conditions for stimulating the development of a sustainable construction market. It assessed why this market has not taken on board the findings of research on the wide variety of sustainability aspects and innovative approaches (looking at the legislative and standardisation framework, innovation in public procurement, the functioning of the supply chain, etc). The increasing focus on energy efficiency and security, as well as climate change issues, has turned the spotlight on the central role played by the Construction/Housing sector. Approximately 40% of total energy consumption in the EU is used for this sector's activities and our buildings (heating/cooling/lighting/etc), so there is great potential for significant reductions at a limited cost. In addition to the funds made available for research into energy efficiency and savings in construction/buildings by the Commission (7^{th} FP, etc), a large number of MS have recently launched major programmes supporting both research and implementation in this area. The Commission is having discussions with a number of industrial and research stakeholders on the creation of a Public-Private Partnership "E2B – Energy Efficient Buildings" to accelerate research and innovation for sustainable high added value products, services and technologies for Energy Efficient Buildings.

Market Structure: Competition

The sector is composed of a large number of small, even micro, enterprises only operating on very localised markets, some very large companies operating internationally (EU-wide and beyond) and a relatively limited number of companies in the middle range. The major players belong, in a number of cases, to mixed activity corporations providing services such as the financing of construction activities and often they are also active in a variety of fields indirectly linked to construction, such as energy, transport, telecommunication and media. Between 1990 and 2006, the Commission approved 48 mergers, and fined one cartel. There is an expectation of consolidation among the large companies, which will lead to the emergence of a few large firms mainly focussing on project management and outsourcing building work to subcontractors (small or micro enterprises). This process might be influenced by recourse of public authorities to public-private partnerships or to concessions, which requires a large financing capacity from the private sector. The demand for construction is greatly influenced by country-specific support measures for home-owners (e.g. subsidies credit, tax incentives).

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[13] OECD (2007), Science, Technology and Industry: Scoreboard and OECD (2009), Research and Development Expenditure in Industry 2009: ANBERD

Market structure: Regulation

In addition to Council Directive 89/106/EEC (Construction Products Directive – CPD), which is currently under revision, together with a Commission proposal for a new Construction Products Regulation that was adopted and sent to the Council and the EP on 23.05.2008, a great deal of Community legislation in other policy fields also has a bearing on the competitiveness of the construction sector, i.e. technical harmonisation, public procurement, rules on health and safety, recognition of qualifications, VAT rules, protection of the environment and consumer protection. The Commission carried out a study in 2007 to analyse and evaluate the effects of certain non sector-specific EU policies on the competitiveness of the construction sector. Although there is little hard data available to assess impact in strict economic terms, it was concluded that several policies have a substantial impact on the functioning of the sector, in particular public procurement rules, measures relating to waste and landfill, health and safety at the workplace and the free movement of labour. While there is general acceptance among sector stakeholders of the need for EU legislation and policy measures, they expressed serious concerns over the variability of interpretation in the MS, which was undermining the internal market. In addition, the REACH Regulation was acknowledged by the construction materials industry as having a significant impact. The sector is highly regulated at national level, including with respect to environmental and labour safety requirements, and to the construction materials used. Builders, design services and construction contractors are required to observe building regulations. The formulation, legislation and enforcement (control of application and building inspection) of such regulations fall within the remit of the Member States, where often considerable power is given to regional and local authorities, depending on the individual constitutional and administrative systems. Furthermore, the construction sector is affected to a large extent by national legislation concerning safety at work, social security, VAT and liability regimes. Urban and spatial planning, at local or regional level, also has a considerable impact on business development in the sector. The recently finalised Eurocodes (European standards) represent a significant step towards a more integrated market. These codes, which are to become the Europe-wide means for structural design of buildings and other engineering works, will be of vital importance to the entire European construction sector, in particular to engineers and architects, when they are fully implemented in the MS (due in 2010).

Environment

Whether directly, or indirectly through the works in which they result, construction activities impact very significantly on the environment. The most important aspects are the loss or deterioration of open landscape and habitats, qualitative and quantitative change of micro-climate, ground and surface water, as well as vegetation due to the built environment, emissions and energy consumption resulting from the use of works, and construction waste particularly from demolition, as well as pollution and disturbance caused by the execution of works. Furthermore, the release of unhealthy or environmentally unfriendly substances from construction products needs to be reduced. Besides sensible land use planning/management, and good design, environmentally respectful and sustainable construction require environmentally friendly materials, developments in energy- and waste-saving, etc. Solutions for environmentally sustainable developments are often based on combinations of good planning, design of works and use of materials. The protection of human health and the environment is mentioned in many national building codes, but with very differing approaches as regards which substances are to be considered as dangerous; moreover, there is no clear definition of construction waste. Such a definition is crucial when analysing the

socio-economic issues related to this waste stream. Sustainability criteria embrace a wide range of issues and there are voluntary schemes on Life Cycle Assessment and Environmental Product Declarations in place at national level. However, there is still no systematic approach to assessing the overall economic and environmental performance of construction assets. The Commission's Lead Market Initiative on sustainable construction will look at good practice in these areas and promote a common methodology to appraise Life Cycle Costing, in particular for large scale building projects and public procurement.

External competitiveness

The globalisation of construction activities is especially important for large civil engineering companies, exporting management and planning concepts, including managerial and engineering skills. While general manual labour generally is performed by a locally available workforce, highly specialised construction functions and materials often require the use of specific equipment and processes. Overall, the managerial and technical skills of these large EU contractors to execute complex international projects range from good to excellent. Many of the main difficulties encountered when competing tend to be related to a lack of openness and transparency of the markets, regarding access to national/local design and materials standards as well as the procurement rules and processes in place. With regards to the latter, many interesting target market countries have not adhered to rules on fair access to public procurement drawn up under WTO auspices (Government Procurement Agreement), to which the EU has signed up. The economic downturn in this respect is also likely to trigger some additional nuisances, with some countries considering implementing measures favouring their own domestic input in capital investments. Finally, , it is often also difficult to set up joint ventures with local partners due to constraints placed on capital shares, employment of local staff, classification of companies, etc. and differences in processes and levels when it comes to quality control and other management procedures.

That being said, Europe is a net exporter of construction services, well ahead of US and Japan. Volume-wise, the world market for construction is dominated to a high degree by the tremendous levels of activity in the emerging economies, in particular China (a market to which European companies have very limited access). In spite of the combined economic/foreign policy efforts of the main emerging economies countries vis-à-vis many smaller developing countries, the European companies have remained relatively strong in terms of winning major contracts on these markets. EU exports represent about 1% of total construction turnover.

Employment and geographical dimension

In 2008, employment in the construction industry as a share of total industry employment was at around 26% for the EU-27.

In 2007, most of the workers employed in the EU-27 construction industry were located in Spain (16% of EU-27 employed persons in that industry), Germany (14% of EU-27), Italy (12%), UK (12%) and France (11%).

In 2006, the majority of employed workers in the construction industry at the EU-27 level were medium-skilled workers (around 49%) and low-skilled workers (around 42%). With 9.6%, the construction industry has a relatively small proportion of high-skilled workers when

compared to 17.3% for all sectors. There are significant differences amongst the various EU countries in terms of wages and salaries.

As in many other sectors, the qualification of personnel is an important factor for the productivity of the construction sector. There is a need to further develop education and training (e.g. lifelong learning), in particular to adopt new methods of working and management as well as technological innovation. Initiatives in these fields should be compatible with scheduling flexibility and the mobile and dispersed nature of construction sites (distance learning). A large proportion of the workforce in the construction industry are self-employed, sometimes leading to precarious remuneration and employment conditions. Construction is often mentioned as a typical case study of undeclared activities. The effect of migrant workers on the structure of the national industries needs to be better evaluated. Furthermore, the risk of accidents in construction is considerably higher than the EU average for all sectors. The new EU strategy on health and safety at work for 2007-2012 recommends in particular the definition and implementation of national strategies targeted at the sectors and companies most affected, and the setting of national targets for reducing occupational accidents and illness, including the construction industry.

Areas of growth (within the sector)

In recent years, many of the developments within the sector have been driven by the availability of relatively cheap and abundant credit. This has had an impact on residential and non-residential buildings, as well as the development of PPP-projects for larger infrastructure and social uses, like hospitals and schools. (Although there has been a generally positive trend across the Union as a whole, there are clearly very large variations among the Member States in the extent of PPP-development). This development has reflected the demand from clients (not exclusively public) to integrate into Design-Build-Operate contracts. Energy efficiency, renewable energy and other sustainability issues have recently been at the top of the agenda, and the sector is looking into how to better respond to this challenge, not least in relation to existing buildings.

Response to structural change

Faced with the challenges of the sector, companies (mainly the larger operators) have responded in recent years by focusing more on improving operational performance through better risk-assessment (including stronger targeting of types of contracts, quality of design, sub-sector specialisation, etc), centralised procurement (economies of scale compared to site-based procurement) and "lean" on-site execution (better planning/sequencing). Often these larger actors have also moved into linked up-stream and down-stream services, as they are able to offer the design-build-operate concepts that the market wants, in particular for PPP projects. Many have also expanded into property development, buying land to develop both residential and non-residential projects based on perceived demand. Such developments allow these companies to better control the inputs to production and should lead to increased productivity (for background, see below under Structure of Sector). In addition, many actors on the market have reacted to the increased demand for a more sustainable construction process and more sustainable buildings, in particular related to energy efficiency, preservation of natural resources and the reduction of demolition waste and construction waste streams. (Restrictive local/regional rules are developing in the MS and the revised EU Waste Framework Directive raises the levels of re-using, recycling and recovery of non-hazardous construction and demolition waste).

Structure of sector

The construction sector is a complex industry with i) pronounced national/regional/local differences, ii) a variety of subsectors, each with their different characteristics and business cycles (infrastructure, residential housing, non-residential buildings, but also a clear distinction between new construction and maintenance/upgrading), iii) a large number of actors/stakeholders influencing the process (developer, user, designer, materials manufacturer, main contractor, sub-contractors, etc.). The above situation has led to highly fragmented, localised markets with limited opportunities for mass production/economies of scale regarding both products and services. These project-based local/regional markets usually comprise a number of smaller actors for whom price competition is the main or only tool available (also not unusually with considerable competition from the "black market"). Thus, the margins in the construction sector are limited (to 2-4%) with no real sign of improvement over time.

Development of labour productivity in the sector has been very poor, both in Europe and worldwide, and it has remained flat during the past two decades (the EU-15 has seen a marginal increase of 4% since 1990, while in the US there has even been a slight downward trend of -3% during this period), although prices have increased more than average, showing a 62% increase in the EU-15 since 1990.

Although there are considerable variations between the individual MS, it is true to say that the large majority of the 2.5 million enterprises in the sector are very small enterprises (92% of construction enterprises in the EU have fewer than 10 employees; in Germany the figure is 82%, while in Italy and the new MS it is about 95%) and only 1 % of the EU companies in this sector have more than 50 employees. However, it should be noted that the largest companies (>50 employees) undertake approx. 40% of the volume of work (ranging from 19% of the work in Italy to 54% of the construction volume in the UK).

Sector-related services

The construction sector consists of a variety of functions, related both to construction products and the provision of relevant services. While traditionally many of the key "services functions", such as architects, engineers and maintenance works, were provided by individual specialised companies performing a specific step in the construction project cycle, recent developments (as indicated under "Response to structural change" above) have revealed a strong tendency towards integrating as many relevant functions and supplies as possible into a single company (or conglomerate).

Vulnerability to financial crisis

The construction sector is heavily dependent on the availability of accessible credit at all levels from major operators, like developers, via contractors to the end users (purchasers of individual houses). This sector has been intimately linked to the credit expansion, with the rise in real estate prices being a strong contributory factor in the development of the "bubble". In a number of Member States (such as UK, Spain, Denmark, the Baltic States), housing prices have stagnated or even fallen over the last 6-12 months, while other MS often enter this stage very abruptly (examples include Sweden and the Netherlands), amid projections that a significant downturn may already have occurred in the last months of 2008. Currently, all indicators from short-term statistics and the surveys by the Commission (DG ECFIN) on such

matters as growth rates, permits, industry confidence show a significant downturn on all national markets for the residential buildings' segment. This downturn in the housing sector seems difficult to avoid, but it should be noted that, until now, the non-residential buildings segment and infrastructure works have appeared to be more resilient. However, observers expect the general economic downturn to also trigger a cyclical downturn in commercial buildings.

In this sector, with its strong dependence on access to credit, we are likely to experience serious short-term delays in purchases by end-consumers, which will lead to sharp falls in the number of projects initiated. However, since the sector operates with relatively long project durations, the negative effects will not reach their peak until several months later, when most ongoing projects are being finalised. These serious strains on the sector will add to the efforts currently being made by the SME end of the sector in particular to refocus on producing more energy efficient new buildings and to improve the energy efficiency of the existing building stock.

Regardless of its origins (strains on the financial market and/or an overall recession) these developments will have important consequences in economic and social terms, not only in the construction industry itself, but also upstream and downstream. While the sector has benefitted from the "bubble economy", and therefore needs adjustment, it is important to stress that efforts are likely to be needed at MS level. It should be noted that those skills will be needed in the near future - possibly more than ever - because of the sector's contribution to the "energy challenge". Given its high potential for improvements, and since most of the energy efficiency investments here are at a negative cost due to considerable energy cost savings in the relatively short term, this sector is essential to achieving major progress in the short-to-medium term. New financial mechanisms might assist the market and its actors in overcoming the factors that are currently limiting such investments, especially in relation to the renovation of existing buildings, which is a market dominated by SMEs in all Member States. Depending on the availability of public funding, it should be noted that maintaining or even increasing investments in infrastructure projects during this period could enable society to contribute towards maintaining a competent construction sector, while acquiring the infrastructure needed for a desired modal shift at lower prices. The current unpredictable credit context, which is not conducive to PPP-projects, is likely to increase the demand for "traditional" public support for energy and infrastructure investments. Such support is not likely to be sufficient to overcome a downturn, but it might have a cushion effect (a somewhat softer landing) allowing society to make significant progress on crucial overarching issues for the future (sustainability, energy dependence, political independence, etc) at a relatively lower cost (prices likely to go down).

8. COSMETICS[14]

Basic facts and figures on the sector

An overview of the cosmetics[15] industry across the EU reveals that, due to its large population, Europe's market is almost as large as those of the U.S. and Japan combined. In 2006, the total EU27 cosmetics market was valued at €63.5 billion. The U.S. cosmetics market was €38.2 billion, while Japan's was €23.7 billion and China's €8.2 billion. Among the EU countries, Germany has the largest cosmetics market, valued at €11.7 billion, followed by France (€10.4 billion), the U.K. (€10 billion), Italy (€8.8 billion), and Spain (€7.4 billion). The European Union exported €8.6 billion worth of cosmetics products in 2005. Exports have grown at a compound annual rate of 9% over the past six years. The EU exports nearly four times more it imports. Perfumes and fragrances and skin and sun care products were the two largest export product groups; together they represent 64% of total exports. Imports grew at a compound annual rate of only 7% to reach €2.2 billion in 2005. The U.S. is the largest cosmetics exporter among the non-EU countries, with €3.8 billion of cosmetics products per year. China exports €825 million of cosmetics products per year.

Competitiveness assessment

Demand in the cosmetics sector is largely determined by general economic conditions, and consumer spending in particular. Growth in the consumer goods market has been sluggish in recent years in the more mature markets of the US and Europe, with companies looking to developing regions for faster growth opportunities. Within Europe, there has been a trend for private label products to expand their market share at the expense of branded goods. The natural (i.e. chemical-free) sector of the market is also growing, although it still accounts for only a small part of the market. The cosmetics industry environment has become more challenging in the following three areas:

- First, the market has become more competitive, particularly in Europe, as existing brands have become stronger, and retailers have also begun to sell their own brands of various products. In addition, mass market producers are getting better at replicating innovative ideas produced by luxury manufacturers more quickly. In developing markets, competition from local low-cost manufacturers is also growing.

- Second, consumers now expect more from manufacturers, due to the increasing choice and variety offered to them in a range of goods.

- Third, rising commodity and energy costs have put pressure on supply and distribution networks.

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[14] Data in this section is derived from: http://ec.europa.eu/enterprise/cosmetics/doc/study_eu_cosmetics_industry.pdf, and "Identification of industrial sectors with weak competition, analysis of causes and impacts" - Final Report to EC DG Enterprise and Industry, Prepared by London Economics in association with ZEW and RPA, August 2007.

[15] NACE 24.5

The most significant threat to the ongoing competitiveness of the industry in most EU countries is the relatively low productivity, combined with high unit labour costs. Simple productivity comparisons across countries expose the wide gap between EU companies and their counterparts in the U.S. and Japan. Even after making adjustments to the data and taking a number of important measurement issues into account, the productivity gap favouring firms in the U.S. and Japan is still considerable. Clearly, manufacturers in these countries have pursued business strategies that have resulted in a more competitive industry. It is also likely that economic policy and the regulatory environment in these countries allows these firms sufficient flexibility to pursue these strategies.

R&D and innovation

Total R&D spending within an individual country also illustrates the importance of the cosmetic market and the impact it can have on the economy. Given that France has the largest domestic cosmetic market; it is not surprising that industry spending on R&D allocations is significant (€263 million). The cosmetics industry in Germany allocates €109 million to R&D activity. France and Germany account for nearly all of the EU's R&D spending. R&D activity is surprisingly low in Italy, given the relatively large size of its domestic cosmetic market. It is minimal in some countries and entirely absent in a large number of others. The R&D is concentrated in a small number of companies, mostly large multinationals. Today's cosmetic market is driven by innovation, including new colour palettes, treatments targeted at specific skin types and unique formulas concentrating on different needs. R&D in this industry is constantly evolving and is conducted so as to facilitate new product development in response to changing consumer demands. In order to stay competitive, companies must successfully anticipate future consumer trends. Many companies have increased their R&D spending over the last few years, due in part to improved profit levels and a realization that consumers may not always stay brand loyal. Many of the latest advances include cosmetics that are designed to treat multiple problems with faster acting formulations. The growing market for men's cosmetics has also led to a new direction in innovation for many companies.

Knowledge and skills

Over the past 25 years, there has been a tremendous increase in the number of cosmetics patents filed. The United States, Japan, Germany, and France have received the majority of patents published; this is not surprising, given their large domestic markets. According to the European Patent Office (EPO), cosmetics patents published by the U.S., China, Germany, Japan, Austria and France combined account for nearly 55 percent of the total patents published in 2005. Over the last 25 years, China, Japan, and Germany have had the strongest growth in the number of patents published, while the U.K. and Italy have experienced relatively large declines over the same period. Poland accounted for over three-quarters of all the patents published within the EU12 (New MS).

Market Structure: Competition

The growth in competition has limited the pricing power in the market, with firms looking to increase sales volumes instead. Firms are focused on strengthening their brands through innovative and high technology products, in addition to running advertising campaigns and increasing interaction with customers. Companies in France, Germany, the U.K., Italy and Spain have been at least as successful at developing comparative advantages in cosmetic

products as their counterparts in the United States. They have been more successful in this regard than firms in Japan and China.

Market Structure: Regulation

The main regulatory framework for cosmetic products is the Cosmetics Directive. The Cosmetics Directive is regularly amended in order to update the list of prohibited, restricted or permitted ingredients, as listed in the annexes to the Cosmetics Directive. The regulatory approach of the Cosmetics Directive is "in-between" the highly regulated sectors with pre-market approval and the sectoral New Approach regulation, which sets out essential requirements for products. The Cosmetics Directive ensures the free movement of cosmetic products by providing the same regulatory framework throughout the Community. It also guarantees the safety of cosmetic products placed on the EU market. Regulators can support the industry by providing a modern, innovation-friendly regulatory framework and by ensuring continued international regulatory cooperation. The final text of the new Regulation on Cosmetics, introducing substantive improvements to the current legal framework, was voted by the European Parliament on 24 March 2009. As a next step, the final text will be formally adopted by the Council. The publication of the new Regulation in the Official Journal is expected after summer of 2009[16].

Environment

Innovation is essential in order to improve the environmental impact of products. The seventh Amendment to the Cosmetics Directive introduced a ban on animal testing of finished cosmetic products from 11 September 2004 and a ban on animal testing of ingredients not later than 11 March 2009 within the EU. It also introduced a ban on the marketing of cosmetic products tested on animals and products containing ingredients tested on animals, within the EU or elsewhere, by not later than 11 March 2009 (for some products 2013). It is important to note, however, that the Cosmetics Directive does not address environmental risks. Therefore, REACH is regarded as environmental legislation that has an impact on the cosmetics sector in terms of further environmental requirements.

External competitiveness

The sector is relatively competitive in the world market, having a world export market share of 45.3% compared to 26.0% on average for all sectors. However, this share has been declining in recent years with growth of -0.3% (compared to an average for all the sectors of 0.04%). Given the limited room for expansion in the mature European market, firms are looking towards targeted product initiatives in existing markets in order to create growth opportunities. Targeting takes the form of both tailoring products to particular regions and also identifying new consumption patterns in different products. For instance, there are significant growth opportunities for men (in the area of face and skincare products) and the baby boomer generation (due to increasing life expectancy and higher aspirations). A number of EU countries have developed a large trade surplus and a significant comparative advantage in cosmetics products. This is clear evidence that cosmetics manufacturers in these countries have, over the years, identified the most important consumer trends and have responded with new product offerings that have been successful. These companies have accomplished this task both in domestic and in export markets. In the process, these companies have

[16] The new Regulation will enter into force 36 months after its publication in the OJ

successfully developed strong brand recognition in a highly competitive and dynamic marketplace.

Employment and geographical dimension

Over 142,000 people are employed in the cosmetics industry in Europe. France, Germany, Italy, the U.K., Spain and Poland together account for more than 127,000 of these. (In Japan, there are about 30,000 employees in the cosmetics industries, whereas in the U.S. there are about 54,000). It is a striking observation that the number of employees in the EU is 50% higher than in the U.S. and Japan taken together. In the EU, employment growth has been remarkably pronounced in the new Member States, with approximately 30% growth registered in 1999-2004, albeit starting from a low base, whereas in the EU15 it has been more modest, at 4.7%. Poland has experienced especially strong growth, in both relative and absolute terms.

Areas of growth (within the sector)

Brand diversification and geographic roll-out (into Eastern Europe, Asia and Latin America) are important parts of growth strategies in the industry. Income distribution and disposable income per capita are predicted to be the major drivers. It is no surprise that China is seen as the fastest-growing market, with significant double-digit growth potential, partly due to the fact that current per capita spending on cosmetics is starting at a very low base. The average growth rate of the cosmetics market in the period of 2000-2006 was 2.2% in the EU27, whereas 6.8% in the new Member States but only 1.9% in the EU15. Due to current economic conditions it is not expected that the growth rate of the EU cosmetics market will exceed 2% in the next five years. The market will remain rather sluggish with downturn in some market segments. In the longer perspective, per capita spending in the new Member States will grow faster than in the EU15, helping to narrow the gap that currently exists between spending levels. The average consumer in the EU12 currently spends only about 40% of what their EU15 counterpart spends on cosmetics. It is expected that this gap will narrow to about 70% by 2020.

Response to structural change

Only 10.9% of firms have entered the industry in the past five years, and just 1% of firms left the industry (on average) between 2001 and 2003. These figures are both lower than the 27 sector averages (of 22.8% and 1.7% respectively), suggesting that it is relatively difficult for firms to enter the industry. New entrants to the sector produced only 1.8% of industry turnover in 2004 (compared to 13.6% for the average of all sectors), which suggests that they might have above-average difficulties to compete with the larger firms in the sector.

Structure of sector

The cosmetics industry is relatively small compared to the other sectors. The turnover is largely generated by the top 100 companies, who held the vast majority (90.2%) of the market in 2004 (compared to the average of 61.2% across all sectors).

There are approx. 3.800 cosmetics producers in the EU. Out of these:

- approx. 80% of companies (i.e. approx. 3000) have less than 19 employees;

- approx. 9% of companies (i.e. approx. 350) have 20-49 employees;
- approx. 8% of companies (i.e. approx. 300) have 50-249 employees;
- approx. 3% of companies (i.e. approx. 100) have more than 250 employees.

There are a significant number of major international cosmetics firms in Europe – mainly in France and Germany. However, the most prominent feature of the market in most countries is that it consists of several hundred small- and medium-sized companies (SMEs).

Sector-related services

A sizeable part of the cosmetics industry's products are sold to the hairdressing and beauty care sector for use in professional salons rather than directly to the consumer.

It is not surprising that the European countries with the biggest cosmetics industries have the highest shares when it comes to the purchase of intermediate goods and services in this particular industry. In Europe, the purchase of intermediate goods and services accounted for about 81.4% of the overall production value in 2005. This number included the acquisition of raw materials, as well as services and goods purchased for resale. These costs for intermediate goods are higher than in the U.S. or in Japan, due to rising costs for commodities worldwide during this period.

9. DEFENCE INDUSTRIES

Basic facts and figures on the sector

The European defence (including civil aerospace) industry employs about 650,000 people. However, the European market is fragmented, with many companies operating within their own national markets, which often leads to duplication of defence programmes and research. In 2007 the public procurement for defence products reached €32.3 billion, of which €6.11 billion or about 19% were spent in collaborative programmes between Member States. This compares to total European defence expenditure (including personal expenditure) of €204 billion (1.69% of GDP), or about €417 per capita. [17]

Competitiveness assessment

In essence, the European Defence Industry consists of the defence part of the activities of companies involved in aeronautics, space, electronics, shipbuilding, engines, trucks, etc. The evolution of the security threat is also driving a technological evolution towards defence products in the range of information technologies, biotechnology and nano-technology, with numerous civil applications. The persistent fragmentation of demand along national lines has led to a very fragmented defence industrial landscape having to answer to different national requirements. The absence of a functioning market is a major obstacle to the consolidation, competitiveness and sustainability of defence-related industries within the EU.

R&D and innovation

Europe is currently spending less than 5% of its government defence budgets on R&D. An increase in the proportion of defence spending devoted to R&D should improve competitiveness by spurring the innovative capacity of Europe's defence industry. At the same time, it makes sense to find ways to pool research and network resources at all levels - political, industrial and scientific - in the defence area. This is particularly important given the impact of collaborative research on subsequent convergence in markets. Researchers in defence are developing technologies that are often similar to their civil counterparts in the stages prior to the development of specific applications. To avoid unnecessary duplication, and taking account of requirements and policy priorities for civil security and defence which may differ, certain initiatives are being undertaken in order to better identify synergies between R&D programmes. For many years, defence investment in Europe has been significantly less than in the US for procurement, but the gap in R&D is even greater – and it is growing. Major efforts are needed to improve R&D in that sector by reducing fragmentation and duplication, and also through a better exploitation of the synergies between defence and civil technologies. The technological evolution towards increasingly complex technologies is generating considerably more product development.

Knowledge and skills

In many areas the European defence sector is at the cutting edge of technological development. This is particularly true in aeronautics, communications, radar etc., which not

[17] 'Defence Data 2007' – European Defence Agency

only often have a beneficial impact on the civilian sector but also necessitate the employment of highly skilled personnel.

Market Structure: Competition

A consolidation and restructuring process has started in Europe, Following years of consolidation and restructuring in the United States, a consolidation and restructuring process has started in Europe. However, it is generally acknowledged that European supply and industry structure will adapt to European demand, if markets are less fragmented. Today, excessively fragmented demand may lead to a situation where the remaining number of European defence companies is still excessively large, in a much smaller combined market than in the US.

Market Structure: Regulation

The defence market is a highly regulated market. The fragmentation of the European defence market and divergent national policies create red tape, hamper innovation and competitiveness and ultimately weaken the European Security and Defence Policy (ESDP). On 5 December 2007 the European Commission presented a package of initiatives to improve this situation. This "defence package" contains three elements: 1) a communication with recommendations for fostering the competitiveness of the sector; 2) a directive on defence procurement to enhance openness and intra-European competition in Member States' defence markets; and 3) a directive on intra-EU transfers of defence products designed to reduce the obstacles to intra-Community trade. The proposed new legislation will contribute to creating a genuine European market in this sector without sacrificing Member State control over their essential defence and security interests. The Communication was welcomed by the Competitiveness Council in May 2008. The two Directives were both adopted at First Reading by the Council. The Transfers Directive was published in the Official Journal in June 2009 and it is expected that the Procurement Directive will also be formally adopted during the summer of 2009.

External competitiveness[18]

The US Government, in 2007, spent more than twice as much on defence than Europe (€454 billion v €204 billion), making the US market the biggest in the world and one in which US firms naturally have an advantage. In 2007, the US devoted 4.5% of its GDP on defence compared to 1.69% in Europe. This dominance is even more marked in the critical area of investment in R&D where, in the same year, the US spent €56.5 billion compared to €9.5 billion in Europe. This has, of course, hampered the technological developments in Europe to some extent and been detrimental to the competitiveness of the industry, but this difference is likely to persist for the foreseeable future. Some restructuring of the European defence industry and the setting-up of an efficient European defence market can bring greater cost efficiency. However, in the interests of competitiveness, major efforts are necessary in order to improve Research and Development in that sector through a reduction of fragmentation and duplication and also through better exploitation of the synergies between defence and civil technologies. In addition, the fluctuating €/$ exchange rate has added to the European industry's difficulties. The overall rise in the value of the Euro versus the dollar has made investment in manufacturing and R&D in the US more attractive.

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[18] 'European – United States Defence Expenditure 2007' – European Defence Agency

Employment and geographical dimension

The European Union defence industry is mostly concentrated in six Member States (France, Germany, Italy, Spain, Sweden and the UK). In 2007 the industry employed about 650.000[19] in total (including the civil aerospace sector), which compares to the 2.3 million[20] (personnel, including civilians) employed by EU Governments. Most of the companies concerned are involved in both military and civil activities. In addition, in recent years the skills base has shifted from those skilled in the traditional engineering of trucks, aircraft and ships, to a more highly skilled workforce, based on R&D, aerodynamics, computer programming, chemistry, physics, etc. which is required in order to develop and apply new techniques, materials, designs and systems.

Areas of growth (within the sector)

The defence sector is a technology-intensive sector where cutting-edge research and development creates a spill-over into other areas. Defence is interlinked with electronics, information and communications technologies, transport, biotechnology and nanotechnology. These are all sectors where SMEs play important and innovative role. Together, these industries constitute a source of opportunity, innovation and know-how which spurs development and growth throughout the economy. Moreover, many new technologies developed for defence have also turned into drivers for growth in civil sectors, such as global positioning, the internet and earth observation. Increasingly this is becoming a two-way process as civil sectors contribute to defence (e.g. development of software). This growing cross-fertilisation is important for Europe's Lisbon Strategy for Growth and Jobs. Furthermore, the sector is becoming more difficult to define as the boundaries between defence and civil technologies (e.g. electronics, telecommunications) are becoming less fixed. Peacekeeping/making missions and the impact of terrorism have led to a blurring of the lines between internal and external security and to a need for better policy co-ordination between the two.

Response to structural change

Anticipation and management of change and restructuring are integral to industrial policy. While an industry that succeeds in addressing market challenges will create new opportunities and benefits, there could still be some adjustment costs, including job losses, in specific regions and/or categories of workers. Even though there is a general agreement that the defence industry will undergo a gradual restructuring in the coming years, there are no figures showing the scale of the changes. A study on the future skills needs expected in the sector in the coming years has been conducted, as an essential element in anticipating change. Dialogue between industry (ASD) and unions (EMF) has started at an informal level in order to identify possible actions in the next two years.

Structure of sector

Although defence production is mostly concentrated in six Member States, companies producing ancillary equipment and systems can be found all over Europe. However, on average, Member States spend by far the majority of their equipment budget domestically.

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19 'Facts & Figures 2007' – AeroSpace & Defence Industries Association of Europe

20 'Defence Data 2007' – European Defence Agency'

European governments have a marked preference for their own national defence industries, not only in order to protect jobs and boost investment, but also to ensure security of supply and of information. Member States are reluctant to accept mutual dependence. As a result, producers from other Member States have only limited, or no, access to domestic defence markets. This results in a fragmented industrial structure with national champions.

Vulnerability to financial crisis

Strengths

- Given the long term nature of defence planning & expenditure, demand is relatively predictable, and this generates confidence among investors.

- Continuing military & security challenges are likely to keep defence as a high priority.

Weaknesses

- The EU defence market is fragmented, with companies experiencing difficulties in accessing other national markets.

Opportunities

- Pressure on defence budgets, combined with ongoing military & security challenges, could lead to more EU co-operation.

- Markets are still strong in key non-EU countries, especially Australia, Brazil, Saudi Arabia, South Korea & Taiwan. These are relatively open markets and EU companies are firmly established.

- Implementation of Commission proposals for directives on defence procurement and on intra-EU transfers of defence-related goods.

- The concentration of Europe's defence industry in only a few Member States does encourage 'skills clusters' which could benefit other industries and provide greater resilience to the economic downturn.

Threats

- An extended period of financial instability would put governments under severe pressure to not just maintain budgets but to cut them back.

- Delaying or cancelling orders will seriously affect confidence in the industry and will be of particular concern to SMEs, who are less able to access finance and sustain themselves through economic downturns.

- Deterioration in the economic situation could lead to strong pressure to return to protecting national markets at the expense of the strength of the European industrial base.

10. ECO-INDUSTRY

Basic facts and figures on the sector

Eco-industry is a horizontal sector consisting of a variety of different activities, such as waste management, biotechnology or ICT. The competitiveness of the eco-industry is of crucial importance, since it will ensure that the EU eco-industry can provide low-cost, effective environmental solutions for the rest of the economy, contributing to a sustainable, competitive economy that provides new and better jobs.

Eco-industry is defined here as "activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems. This includes cleaner technologies, products and services that reduce environmental risk and minimise pollution and resource use"[21]. The following subsectors are the core of eco-industry: process management (including solid waste management & recycling, waste water treatment, air pollution control, general public administration, private environmental management, remediation & clean up of soil & groundwater, noise & vibration control, environmental Research & Development and environmental monitoring & instrumentation) and resource management (including water supply, recycled materials, renewable energy production, nature protection and eco-construction).

The core of the European eco-industry grew by 8.3% per annum between 2004 and 2008, a well above average increase, generating a turnover in 2008 of €319 billion.[22] It directly employed 3.4 million people and spent approximately €5 billion on R&D (2004).[23] Leading European countries in eco-industry, in terms of the industry's turnover relative to GDP, are Denmark, Austria, Poland, Slovenia, Germany and the Netherlands. Germany and France together account for 49% of the EU's turnover. The 10 New Member States account for only 6% of the sector's turnover. With annual growth of up to 5%, the eco-industry was one of the most dynamic sectors of the EU's economy in the 1990s. Roland Berger[24] forecasts that the worldwide growth rate of the eco-industry will be 5.4% per annum over 2005-2020 and reach a global market value of EUR 2.2 trillion (compared to EUR 1 trillion in 2005). The growth of the various subsectors and the drivers of that growth reveal a number of differences: whereas some of the process management sectors, such as the waste sector, are quite mature, other sectors such as air pollution control, recycled materials and the renewable energy present substantial opportunities both now and in the future.

While the above sectors are only the core sectors of the eco-industry, other industries also produce environmental efficient solutions, goods and services. Mechanical engineering and ICT are two sectors which have the clear potential to improve energy and environmental efficiency in other sectors. Also, the automotive industry and household appliances all provide solutions, produce components (such as catalytic converters) or offer products that contribute to making the overall output less environmentally harmful.

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21 Based on OECD/Eurostat of eco-industry

22 Ecorys & Idea Consult (2009) Study on the Competitiveness of the EU Eco-industry, forthcoming

23 Ecorys & Idea Consult (2009) idem and E&Y (2006)

24 Roland Berger (2007) Environmental protection as a business driver

Competitiveness assessment

The sustainable consumption and production and sustainable industrial policy action plan announced the launch of industrial policy initiatives for the eco-industry. These initiatives will be based on a competitiveness analysis of the eco-industry which is currently being undertaken. The current competitiveness assessment is, therefore, preliminary. The ability of the eco-industry's products to compete with alternative products depends on their relative prices. High prices for energy, such as oil, mean that renewable energy or more energy efficient goods and services are seeing the demand for them increase. The extent of internalisation of environmental costs affects relative prices and therefore demand for the eco-industry's goods and services. In general, regulation that internalises external environmental costs will provide growth opportunities for eco-industries.

E&Y (2008) have provided some interesting insights for a competitiveness assessment[25]:

First, countries cannot artificially create a competitive advantage for eco-industry if there is no basis for doing so. Building on existing comparative advantages seems a better guarantee of success. Regulation and targets as stand-alone options to grow eco-industry do not seem to be cost-effective.

Second, the competitiveness factors characterising the economy as a whole will also play an important role for eco-industry. For example: the US has a much better venture capital market. In the last few years, US venture capital investment in clean technologies has skyrocketed, whereas the EU's venture capital investment in these technologies has continued to grow at a moderate pace. Although we are not there yet, the possibility of the US establishing itself as the technology leader in eco-industry cannot be ruled out.

R&D and innovation

The share of environmental R&D as a share of total government R&D has increased steadily since 1981 in those EU countries for which data are available. For instance, in Germany, France and the UK the share of environmental R&D in total government R&D increased from 1% in 1981 to around 4%, 2% and 3% respectively in 2005. The development of environmental technologies is supported by the **7th Research Framework Programme (FP7)**, such as in the Environment (including climate change) theme. In addition, industry has developed within the European Technology Platforms research agendas dealing with, for example, Water Supply and Sanitation and the Construction technology. The USA and Japan spend less than 1% of their total government R&D budget on environmental research. In the USA there has actually been a decline in environment-related R&D investment since 1981.[26] Nonetheless, a look at the venture capital situation shows that the above picture is too positive for the EU. There are some worrying trends for the future. Clean tech investment[27] by venture capital funds has increased much more rapidly in the US than in the EU, especially since 2004. Also the US spends relatively more on clean tech: In the US, 5.4 % of all venture

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25 E&Y (2008) Green Business and Comparative Advantage. Report for the BERR, UK.

26 OECD (2005) Research and Development Statistics (Paris: OECD)

27 Clean tech investment is defined as investment in energy generation, energy storage, treatment and reuse, energy efficiency, industry focused products and services. As such clean tech investment is not the same as investment in eco-industry yet the developments are so clear-cut that the results should not be discounted.

capital is invested in clean tech, compared to 4.4% in Europe.[28] If this trend continues, the US could take the technology lead in eco-industries and could increase its international competitiveness in this area. Since 1978 the number of patents for eco-industries products has been growing more slowly than the overall number of patents, with the possible exception of water pollution treatment. For solid waste and recycling, the number of patents peaked in the 1990s.[29] Based on more disaggregated data some kind of specialization seems to be taking place, with the USA specialising in water pollution and Germany and Japan focusing on air pollution. In general, based on EPO patent counts, Germany, the USA and Japan are the most active countries in terms of patent applications for eco-industry. Depending on the sector, France, United Kingdom, the Netherlands, Denmark, Austria and Sweden are also applying for patents. An OECD study on environmental practices in firms showed that between 5%-10% of the respondents from France, Germany and Hungary said that they had a budget for environmental R&D[30].

Knowledge and skills

In general, a lack of skilled personnel and knowledge of consumers' needs constrains the growth of eco-industry, e.g. in eco-construction. Architects and construction workers are not always aware of what the environmental performance of products is and/or how they should be installed for the best environmental effect. Consumers also have difficulties distinguishing environmentally sound products from normal products. Lack of entrepreneurial talent has been one of the biggest bottlenecks for the cleantech industry. Some of the skills necessary to run an eco-innovative company (business and scientific acumen, project finance experience, knowledge of the regulatory framework) are different from those required in traditional sectors. Start-ups also face a battle for engineers and scientists.

Market Structure: Competition

Limited competition in the upstream industry, e.g. in the renewable energy sector, might sometimes constrain the demand of eco-industries. For example, the electricity market is concentrated and this might hamper the entry capabilities of renewable energy suppliers.

Market Structure: Regulation

The study on the competitiveness of eco-industry is investigating how the quality of regulation and trade in the internal market are affecting the competitiveness of eco-industry. As regards regulation, there is evidence that, in the past, environmental regulation has not always been designed to take innovation into account. For instance, in order to stimulate innovation, and thus eco-industry, environmental regulation should be designed as result based and not as technology based. Also, the problem of accessing the electricity grid for renewable energies is also in part a regulatory problem. Permit procedures for construction of renewable energy can be lengthy, and also physical access to the grid can be limited by regulation.

Concerning the Internal market dimension, parts of the eco-industries have traditionally been seen as related to the public sector and, for this reason, these sectors have often been excluded

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28 E&Y (2008) Green Business and Comparative Advantage. Report for the BERR, UK.

29 OECD (2008) Environmental Policy, Technological innovation and patents, forthcoming.

30 "OECD Sustainable Development Studies: Measuring Sustainable Production", OECD, 2008a

from the Single Market. For example, /large parts of eco-industry are excluded from the scope of the Services Directive. Also, it may be necessary to establish harmonised standards for environmental goods and services in order to fully capture the potential in some sectors, such as eco-construction and recycled materials.

Environment

By definition, eco-industry provides environment-friendly solutions for other industries. In principle, its competitiveness would benefit from incentives and environmental standard set for other industries to improve their environmental performance as well as on its own ability to promote its products as a ***replacement/substitute*** (in terms of redirecting funding, workforce, training, trading, planning, demand and supply etc.) of other products, depending on environmentally detrimental activities.

External competitiveness

According to Roland Berger (2007) the EU has large market shares in the eco-industry markets. The EU's market share is 10% for material efficiency and natural resources, 30% for sustainable water management, 35% for sustainable mobility, 35% for energy efficiency, 40% for green power generation and 50% for waste management and recycling. It is estimated that the EU currently has a positive trade balance in trade in environmental goods and services. The three major markets (Germany, France and the UK) are all net exporters of eco-industry goods and services and are responsible for 55% of eco-industry trade.

Employment and geographical dimension

Generally the employment outlook for environmental industries is positive. Recent reports[31] show that job-creation in green industry sectors will outweigh job losses in sectors based on fossil resources. It is expected that there will be 2 million new jobs in Europe by 2020 in the renewable energy sector alone.

Areas of growth (within the sector)

- Recycling materials: until late 2008, the increase in price of raw materials made recycling of materials more attractive. As a result, there has been pronounced growth in this sector.

- Renewable energy: Efforts to reduce the carbon content of electricity production, security of supply issues, and, until late 2008, the rise in oil prices have contributed to the growth of the renewable energy sector. Renewable energy in the EU had a turnover of €30 billion in 2007, providing approximately 350 000 jobs. Employment opportunities are vast, ranging from high-tech manufacturing of photovoltaic components to maintenance jobs at wind power plants or in the agricultural sector producing biomass. In 2007, global investment in sustainable energy increased by 43%. Market revenues for solar, wind, biofuels and fuel cells are forecast to rise to approximately €150 billion by 2016, while the record levels of investment in wind, solar and biofuels reflect technological maturity, more policy incentives and increased investor confidence[32].

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31 "Green jobs: Towards decent work in a sustainable, low-carbon world", UNEP, 2008

32 European Commission (2008) Memo on the Renewable Energy and Climate Change Package MEMO/08/33 Date: 23/01/2008

- Air Pollution Control, Environmental Research & Development and Environmental Monitoring & Instrumentation: these are sectors that help other companies abate CO_2 emissions. Given the ETS proposal for a 20% abatement of CO_2 emissions by 2020, there will be a growth potential for these industries in the following areas:

- Recovery of resources from abandoned landfills - medium market potential

- Use of renewable resources in construction and manufacturing - high market potential

- Resource saving and waste minimising production processes, involving technologies for process measurement and control - very high market potential

- Light-weight construction and manufacturing: Tailored components in the automobile industry, bionic construction principles - high market potential

- Long-lasting and easy-to-repair products - medium market potential

- Co-operative use of products, e.g. car-sharing - low market potential

- Miniaturisation: nanotechnology and molecular biotechnology - market potential impossible to assess.

Response to structural change

By helping other companies cope with climate change in a cost effective way, the eco-industry can contribute to minimising the structural change required as a consequence of climate change in other industrial sectors. The innovative parts of the eco-industry are likely to face similar problems to those of other innovative industries: poor access to capital and poor access to qualified personnel. This could harm their growth rates and could make environmental solutions more expensive for the entire economy.

Structure of sector

Based on preliminary results for one sector[33] the EU eco-industry has a similar structure to the rest of the EU economy, in other words 98% of firms are SMEs. However, a few big companies are probably responsible for most of the turnover.

Sector-related services

Some of the eco-industry sectors are actually providing services (e.g. remediation and clean up of soil and groundwater, private environmental management, environmental research and development). Other sectors provide integrated manufacturing-services solutions (e.g. noise & vibration control, environmental monitoring & instrumentation).

Vulnerability to repercussions of the financial crisis

The crisis is likely to badly affect the environmental industries, as demand for environmental goods and services may shrink by more than industrial output. This is because reduced

[33] NACE 90: sewage and refuse disposal, sanitation and similar activities

activity in the upstream industry will make it easier to meet the environmental obligations without further abatement investments. Moreover, given the credit constraints, it is likely that upstream industries will focus their resources on running the day-to-day business and making the necessary investments to prepare for future growth opportunities, while postponing investment in environmental technologies.

For renewable energy and recyclates, this is further compounded by the weakening of the competitive position due to the rapid fall in the prices of raw materials and traditional energy. Since September 2008, prices for aluminium scrap and plastic waste have dropped to 2005 levels; the price of waste paper has fallen from €50 a tonne to €0-5 a tonne, which is less than the cost of collecting and sorting it. There is evidence that prices/demand for primary metals have come down in much the same way as for secondary (scrap) metals. As a result, recycling markets were collapsing at the end of 2008, while stocks grew rapidly. This may have negative long-term structural consequences as public confidence in separate collection schemes and supply-demand networks that have been built up over the last decade could be put at risk. If individual collection schemes weaken or collapse, significant costs and administrative efforts will be needed to re-build them once economic recovery begins. At the request of Ireland, the Environmental Council is discussing the impacts of the crisis on the recycling industry with a view to identifying measures that could boost the short and long term competitiveness of that industry in Europe.

Finally, the financial crisis will mean that there is less availability of financing for investment needs in the eco-industry itself. The eco-industry's many SMEs depend on access to finance in order to continue to grow and innovate.

With a high potential for improvements and since most of the energy intensity investments in the sector are at a low or negative cost over life cycle due to considerable energy cost savings in a relatively short term, this sector is essential when aiming at major progress in short-to medium term.

In the longer term, the sector has a steady and stable growth potential, as the need for investment to reach the targets for renewable energy, energy efficiency and CO2 and the concerns about security of supply and future price volatility of raw materials and oil will help keep the demand for eco-industry products and services high.

11. ELECTRICAL AND ELECTRONIC ENGINEERING[34]

Basic facts and figures on the sector[35]

The sector covers a wide range of electrical and electronic products, as well as equipment and systems. These include electromechanical engineering (NACE 31), domestic appliances (29.71), electronic components (32.10), transmission apparatus and telephones (32.20) consumer electronics (32.30), computer machines (30.02), electro-medical equipment (33.10) and other electronic instruments. (33.20, 33.30).

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34 NACE 31

35 Key issues of the sector are addressed by the Electra report, written by a team of experts from the electrical and electronics engineering industry, CENELEC and the European Commission http://ec.europa.eu/enterprise/electr_equipoment/electrareport.pdf

Together these sectors employ around 3.58 million people. Their output of € 501,771 million in 2007 represented 9.84 % of the total EU27 manufacturing industry.

All sub-sectors showed modest to dynamic growth rates, except for transmission apparatus and telephones, which declined. Between 2006 and 2007 the overall weight of this subsector decreased from 10.3% to 9.8% of total EU27 manufacturing output.

Although exports increased by 15% in the past three years, over the same period imports exceeded exports, resulting in a negative trade balance.

Taking electrical engineering and electronics separately, we can see that the respective trends are quite uneven. While electrical engineering exports increased by 52%, electronics exports started to decline in 2005. The trade balance of electrical engineering products has remained positive, but the same is not true for electronics, where the trade balance has turned significantly into the red in the last four years owing to the sustained increase in ICT imports from south-east Asian countries.

Competitiveness assessment

As a major supplier to other sectors, Electrical and Electronic Engineering (EEE) is very "cycle-sensitive". As a result, when there is a slowdown in the EU economy as a whole, the growth rate in EEE falls well below the overall GDP growth rate. As a knowledge-based sector, EEE suffers from the long-term negative effect that during times of prolonged negative GDP growth, companies shed a significant portion of their engineers and other skilled technicians, whom they have great difficulty in recovering afterwards. Gradual measures to smooth structural change are therefore very important for this sector.

R&D and Innovation

Continuous R&D and innovation efforts are key to guaranteeing the long-term competitiveness of Europe's electrical engineering industries.

EEE are closely involved in the **Framework Programme 7** (FP7) research programmes, namely in the NMP R&D programme, and in **European technology platforms** (ETPs) such as the ManuFuture Technology Platform.

As proposed in the **Commission's Recovery Plan (the Factories of the Future Initiative)** adopted in November 2008, we see the creation of a joint research initiative between public and private sectors at EU level is seen as the right step forward to foster sustainable growth, competitiveness and durable job creation. The Factories of the Future initiative and a ManuFuture JTI are seen as a unique opportunity to change the status quo and to involve companies, including SMEs, in European research projects.

European research, technical development and innovation policies should focus on developing the framework conditions that stimulate innovation, entrepreneurship and, thus, growth and employment.

In addition, horizontal work on product market and sector monitoring of the Commission identified innovation as an important challenge for the sector[36].

Knowledge and skills

Renewed attention must be paid to the effective enforcement of IPR legislation already nominally adopted by certain third countries, such as China. Another serious problem, which hampers the future development of the EEE, in particularly its RD/innovation performance, is the shortage of engineers and other high skilled personnel designing, innovating and producing advanced technologies.

Market structure: Competition

Of the 257 merger cases in the sector notified to the Commission since 1990, eleven have been approved subject to remedies and two have been prohibited. There have been two anti-trust cases where the Commission imposed fines for agreements restricting competition. Restructuring of the sector is not confined to consolidation and larger companies.

Market structure: Regulation

Of the large trade blocs and industrial countries the EU is the most open market for electrical, electronic equipment and appliances. The piece of European law that most directly concerns electrical equipment under low voltage is the **Low Voltage Directive**. The absence of third-party intervention in the conformity assessment procedures laid down by this Directive greatly reduces the burden on the manufacturer. This is a model of business friendly legislation for other trade blocs. The Low Voltage Directive has contributed substantially to the Single EU Market for electrical and electronic products since 1973.

Most electrical equipment is also subject to the Directive on Electromagnetic Compatibility (**EMC Directive**). This Directive establishes essential requirements to prevent electrical and electronic equipment from generating or being affected by electromagnetic disturbances. It is also based on manufacturer self-declaration of conformity and is highly appreciated by industry.

Although recognising the need for and benefits of harmonisation, industry believes that the cumulative effect of legislation originating from various policy areas and levels can pose problems, particularly for SMEs. There is a risk that EU manufacturers might become the target of unfair competition, thereby impacting on the competitive situation of European companies. More attention is needed in order to deal with counterfeit and non-compliant equipment.

Environment

EEE manufacturers are affected by Community environmental legislation that relates to products either directly, such as the Directive on energy using products (EuP) and the twin Directives on management of waste from electrical and electronic equipment (WEEE) and on

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[36] An analysis of the possible causes of product market malfunctioning in the EU: First results for manufacturing and service sectors, European Economy – Economic Papers 336 (August 2008), http://ec.europa.eu/economy_finance/publication13083_en.pdf

the use of certain hazardous substances in this equipment (RoHS), or indirectly (framework Directive on waste, Regulation on waste shipments).

Electrical and electronic products are also concerned by energy labelling requirements and voluntary Community schemes, such as the Ecolabel. Production sites are affected by legislation on installations such as Integrated Prevention and Pollution Control (IPPC) and voluntary schemes like EMAS. This industry is a major user of chemicals. As such, it could face significant adaptation costs and time-to-market problems if in the context of the implementation of REACH substances used for specific purposes are withdrawn. Besides, the sector will be directly affected by the Directive establishing a framework for setting the eco-design requirements for energy-using products (EuP). The EuP Directive is a coherent framework for addressing all the environmental aspects of energy-using products in a harmonised and integrated manner. This Directive is expected to promote product quality and thus strengthen the competitiveness of the sector's enterprises. Regulatory eco-design requirements will be set by the subsequent implementing measures, to be adopted by the Commission.

External competitiveness

China's has the largest share of world production, followed by the EU27, USA, and Japan.

In all regions, the number of the sector employees as a share of the total of the industry employees is high: 8 % in EU27 and in US, 12 % in Japan and China.

As regards apparent consumption, China is the biggest market and Japan is the smallest; the EU27 and the USA follow close behind.

EU27 and US production is less than apparent consumption. In Japan and China the situation is reversed, i.e. these countries are net suppliers to the rest of the world.

Value added is 63 % of production in the US. This is much higher than in the EU27 (44.5 %), Japan (36 %) and China (22 %). As a result of differences in productivity, the ratio of production per employee to value added per employee varies significantly between US (1.5) and China (5). China has enormous potential to increase productivity and will therefore be an even more serious challenge to the EU in the future.

Counterfeiting of EU EEE brands is a serious and growing problem for European manufacturers. It is estimated that over 5% of equipment sold as 'made in the EU' is counterfeit. This affects not only the country where these brands are produced, but the EU and third country markets too.

Access to third countries markets is also frequently hindered by local safety standards and certification/testing procedures which very often are not in line with international trends. This concerns Asian countries, and also some key developed trade partners. Significant investments are needed to align EU products to local requirements. Very often, the latter requirements are applied in a discriminatory manner, according to domestic industrial policy needs in the countries concerned.

Employment and geographical dimension

The electrical and optical equipment manufacturing sector in Germany has contributed in the region of one third (33.3 %) of the value added generated by the sector across the EU-27, with France following in its tracks (13.2 %). In Finland and Hungary the electrical and optical equipment manufacturing sector was the largest sector within the industrial economy on the basis of value added data. Germany, Slovenia and the Czech Republic are also relatively specialised in the manufacture of electrical machinery and optical equipment sector. There are many regions in Germany that are also specialised in this sector and many regions in the Czech Republic and Hungary, as well as Slovenia.

Structure of the sector

In EU27 as a whole, the structure of production is highly diversified. However, there are huge differences among Member States, especially between the "old" and "new" Member States.

The structure of the industry is characterised by a two-tier system: a few large corporations producing a wide range of electrical and electronic equipment, and many small companies specialised in niche markets.

A characteristic of the EU industry is the comparatively high level of employment relative to output.

Areas of growth (within the sector)

Except for transmission apparatus and telephones, which declined in 2007, all sub-sectors performed satisfactorily in general.

In the past, two subsectors have shown the highest growth over the long term: electric motors, generators & transformers, and other electrical equipment (in the period 1999-2005 the former grew by 27% in current terms and the latter by 22%). Now, with the opportunities afforded by the climate change programme, the focus is on energy efficiency and energy security, which is widening the scope for growth, both in the short term and in the context of the Lead Markets Initiative.[37]

Response to structural change

The fact that EEE Industries supply products to be used in the production processes of all sectors of the economy means that their performance relies heavily on the investment intensity in those sectors.

The current financial crisis is affecting the real economy and obviously the manufacturing industry too. Shortage of external financing due to the lack of liquidity and confidence of credit institutions is likely to slow down the production of all sectors.

Products with a short production cycle are liable to be more affected by the lack of credit than those with longer cycles.

Sector-related services

[37] For details see Electra report: http://ec.europa.eu/enterprise/electr_equipment/electra.htm.

New opportunities could arise in the area of performance contracting, in particular if this is taken up as part of the recast of the EPBD and in a harmonised manner.

Vulnerability to financial crisis

The sector is directly affected by the current financial crisis. The short-cyclic part of this business is feeling the crisis directly, whereas the long-cyclic business still seems to be more stable. The energy technology subsector, on the other hand, is relatively stable as it involves mostly long-term investments.

12. FOOD INDUSTRY[38]

Basic facts and figures on the sector

With a market share of 12.2 %, the food industry[39] is the second largest sector in the manufacturing industry in value added terms (after the basic metals and fabricated metal products); it accounts for 14.5% of total manufacturing turnover (€917 billion for EU27) and 13.7% of employment (over 4.5 million workers). Over the last ten years the industry has had relatively limited but stable growth in both production (1.8%) and value added (1.1%), and negative employment growth rates, yielding positive rates of productivity growth. Germany, France, Italy, Spain and the UK account for 70% of the turnover for EU27, whereas the twelve new Member States account for only 8.7%. The investment rate is relatively low, and labour costs are high. The EU Food Industry sector is extremely fragmented and characterised by a very large number of SMEs that are less permeable to innovation than the big (multinational) companies. While the average increase of the turnover for the manufacturing industry between 2000 and 2005 was 2.2%, the increase for the food industry was 3%. However, labour productivity for the European food and drink industry is lower than most other industries and there is a higher percentage of part-time employees and a low percentage of employees with high-level skills. On the world markets, the sales of the European food and drink products in recent years have increased by around 3% per year, but this growth is much lower than that of developing economies like China.

Competitiveness assessment

The Food Industry has some strong points that can serve to further strengthen its position in the manufacturing industry. It is made up of about 310,000 companies and provides jobs for more than 4 million people. It is one of the most important industrial sectors and its proper functioning plays a key role in the health and prosperity of the people of Europe. The high value products that are exported and the increased competition between the companies of the food processing sector are characteristics that should be maintained and further developed. On the other hand, the European food industry is weaker in terms of economies of scale and its performance on growth or labour productivity is poor. The large number of small enterprises specialised in local products and the cultural differences between the European regions could render entry on those markets more difficult. In future, there will be many opportunities for the food industry to improve its performance and increase its role in the manufacturing sector. The large size of the European common market – 491 million people compared to 300 million in the USA (for 2005) –enables the food industry companies to increase their productivity and to make more effective use of economies of scale. Furthermore, the cultural differences and the different food habits in Europe provide an opportunity for innovation and the development of new products. One of the major threats to the food industry is the low growth in production and it seems that this will have to be resolved by exploiting markets outside the European Union area. The complexity of EU law and the administrative burdens that this imposes, access to finance, low investment in research and development and access to raw materials,

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38 The sources of information for this fiches on Food Industry are:
1. Eurostat - Structural Business Statistics (SBS)
2. Data and trends of the European Food and Drink Industry (CIAA, 2007)
3. CIAA review of key competitiveness indicators (2008 report)

39 NACE 15, 16

are among the main problems that the industry has to confront in order to increase its competitiveness in the world markets.

R&D and innovation

R&D is one of the most important tools for innovation, productivity growth and the competitiveness of all industry sectors. However, despite its significance, the food industry is not recognised as being particularly innovative compared to other industry branches. The share of R&D expenditure in value added in 2005 was between 0.8% and 1.1% for Germany, France, Spain and the UK. The innovation performance is based on 12 innovation indicators (share of employees with higher education, share of firms that use training, share of firms that receive public subsidies to innovate, etc.) and the food sector is performing below the average in 9 of those12 indicators. The best performance is observed in the share of firms that receive public subsidies to innovate, and the share of firms that innovate in-house. The best performing Member States are Sweden, France and Belgium. One of the main challenges related to innovation in the food industry is the conservatism of the food consumers and the low return on investments and profits of the companies that invest in more innovative activities. Moreover, the sector is dominated by SMEs which are unwilling or do not have sufficient resources to invest in research and innovation. Another obstacle to research and innovation is the fact that in most European countries food research centres and the industry are not closely aligned. On the other hand, consumers' expectations for high quality and healthy products lead to demand-oriented innovation activities, support for novel food products and a growing concern about tolerance of genetically modified organisms (GMOs).

Knowledge and skills

The food manufacturing industry in the EU is characterised by lower ICT intensity and weaker R&D investment and innovation than its main competitors. Innovation for the creation of new products and new production processes is limited, particularly in biotechnology (EU is lagging behind the US in biotechnology patent applications, including the food sector). Initiatives have been taken to develop the European Technology Platform (ETP) on Food for Life, which are directed at research in nutritional sciences and food technologies, in order to deliver novel and innovative food products for national, regional and global markets. The vision report of the ETP on Food for Life was published in 2005 and the main challenges that the food industry faces are: ensuring that the healthy choice is the easy choice for the consumers, supporting a healthy diet and developing quality food products through sustainable food production.

Market structure: Competition

The food sector is one of Europe's most important manufacturing sectors, but it suffers from fragmentation. There are a number of large multinational companies competing in the world markets with a wide variety of products and, at the same time, 99% of all enterprises are small and medium sized (SMEs). Despite the large number of SMEs, the food sector in Europe (and globally) is perceived to be dominated by a few big players. Another important part of the food industry is the retail sector, which is the direct link between consumers and suppliers. The steep rise in the global trade of food and agricultural products and the easier market access made possible by the WTO has led to an expansion of the activities of retailers and the use of strategies such as mergers and acquisitions in order to strengthen their position. In

parallel to this concentration trend, it seems nonetheless that such retailers have had a positive impact on product quality and innovation (new products, safety standards).

Market structure: Regulation

EU Food legislation has developed significantly over the last 15 years. The high level of consumer protection guaranteed by compliance with EU food law may well contribute to the reputation of EU food products, both on the EU market and on the world market, and thus directly supports the market position of the European food sector. However, there is room for improvement in terms of administrative burdens and the length of authorization procedures. This is particularly relevant for SMEs.

The environmental legislation has now developed to cover the activity of the food industry in various forms:

- Integrated Pollution Prevention and Control Directive (the BREF for the food and drink sector has been finalised)
- Directive on packaging and packaging waste
- Framework Directive on Waste (interpretative note completed)
- Climate change (Emission trading scheme – ETS)

The current EU Emission Trading System (ETS) is compulsory for food and drink companies with combustion installations of a capacity greater than 25 MW. This measure is considered to be an efficient tool for reducing GHG emissions caused by large installations at least cost.

This new set of legislation creates another administrative burden, and it is essential to avoid any overlapping with the food legislation. On the other hand, it is an opportunity for the food industry to be fully involved in the eco-innovation trends, providing sustainable growth and jobs.

External competitiveness

The EU plays a key role in the world trade of food and drink products. Despite the fact that the share of EU exports in the world has decreased in the last ten years in favour of developing countries such as Brazil and China, the EU is still the largest food exporter (20.8% share in world exports) and the second largest importer (18.1% in world imports). Additionally, in 2006 the growth in value added for the European food industry was higher (6.6%) than the growth achieved by Australia, USA, Canada and Japan, but much lower than that of China (17.7%) and Brazil (22.5%). The annual growth of exports and imports for processed food products was around 5% for the period 2001-2006 in EU27. The EU food industry has the additional difficulty of prices for agricultural raw materials that are higher than those of its global competitors. Furthermore, EU manufacturers are confronted with a large number of tariff and non-tariff barriers (for example, different regulations on food safety) in trying to access world markets. Export refunds have served as a means to compensate the food industry for the higher prices of agricultural raw materials. However, the gradual weakening of this measure opens the door to new instruments like the Inward Processing Regime, which is directed at processing raw materials produced in third countries and exporting these processed products to non EU countries tariff-free.

Employment and the geographical dimension

The food industry consists of about 310,000 enterprises and it is the second largest industrial employer, with 4.8 million employees (a number that is continuing to fall, in particular in the new Member States), of which 62% are employed in SMEs (undertakings of less than 250 persons) representing virtually the total number of enterprises. 64% of all the food and drink enterprises are located in Germany, France, Italy and Spain. The food industry's share of employment is about 14% of the total manufacturing sector as a whole. The highest rate of employment growth for 2005 was observed in Spain and Greece. Germany, France, Italy, Spain and the UK are the main contributors, accounting for more than 70% of turnover (2005), whereas the twelve new Member States account for only 8.7%. Two particular characteristics that can be found in the food industry are the higher percentage of women and of employees working part-time compared to other manufacturing industries.

Areas of growth (within the sector)

The list of the food processing subsectors and their percentage of turnover in the food and drink industry is as follows: Meat (22%); Grain based, Starch and further processed products (16%); Beverage industry (16%); Dairy Products (15%); Sugar and sugar based products (8%); Processed Fruits and Vegetables (7%); Oils and Fats (5%) and Fish and Seafood (3%). The EU beverage industry, which supplies a variety of wines, beers, spirits (alcoholic) and mineral waters/soft drinks, is a global market leader for all segments and represents the largest production in the world (more than €120 billion in 2005) as well as accounting for over 73% of world exports. Furthermore, the fruit and vegetable processing sector is one of the most competitive sectors in the EU, with the EU countries having an export share of about 48%. Lastly, despite the small percentage of turnover of the seafood industry, EU production has risen by about 70% in the last 10 years and the highest production was found in Spain and France.

Vulnerability to financial crisis

The present crisis may impact on the Agri-Food Industry in three ways:

1) Greater difficulty in getting credit from the banking system, above all for SMEs, which make up more than 99% of the number of companies in the sector;

2) Increased volatility of the prices of raw materials, which are currently turning down;

3) Re-orientation of demand from customers, who have less purchasing power due to the likely threat of a global recession.

In addition, it will be more difficult to remedy Europe's lack of investment in R&D in this sector. On the other hand, the Agri-Food Industry should be less affected by the crisis than other sectors because of its well known economic buffer effect. In a period of growth its pace is slower than the others, while in a period of stagnation it remains stable or can even increase output without reducing manpower. However, globalisation and the impact of international competition could undermine the vitality of this sector.

The economic context of the food industry is characterised by diversity (products, culture, processes, markets) and, as a result, exposure to a wide variety of European policies (on Competitiveness, Internal Market, Agriculture, Food safety, Competition, Environment,

Trade, Research, Customs …). Therefore, there is a need for a multidisciplinary and consolidated approach that brings consistency to European policy actions that impact on this industry.

13. FOOTWEAR[40]

Basic facts and figures on the sector

According to the latest structural data available, the footwear sector[41] consists of more than 26,600 enterprises, generating €26.2 billion in turnover and €6.9 billion in value added (0.5% of total EU manufacturing), and directly employing 388,000 people (EU-27, 2006). The sector is dominated by SMEs, which generate 65% of the added value. Two thirds of the total EU footwear production is actually concentrated in three countries: Italy, Spain and Portugal, with Italy accounting for around 50% of EU production.

Between 2000 and 2005 the decline in footwear production was 8% per annum on average. In 2006 and 2007, the rate of decline in the production index slowed down (to 3% on average), compounding the major fall of 10% in 2008. Due to the continuous losses in EU production, the production index in 2008 was 50% below the index value of 2000. In the first quarter of 2009, the decline in production has accelerated to reach -18.3% compared to the same period of the previous year.

The industry has lost around 4 % of its workforce per year over the last eight years. In contrast with other manufacturing sectors, the drop in employment in the footwear industry has not been accompanied by productivity gains, as output fell by more than employment. The competitive advantages of EU production lie in the high quality of production in technical, aesthetic and fashion-related terms, and the development of highly sought after brands with a strong image.

Competitiveness assessment

The main *strengths* of the sector are the following:

- The footwear sector has undergone a restructuring in the past decades and introduced organisational and technological changes. It has outsourced low added value operations to other countries (e.g. Maghreb);
- It has high quality of production in technical, aesthetic, design and fashion related terms;
- It has a strong image worldwide and has established markets within and outside Europe.

The main *weaknesses* are:

- High costs compared with Asian countries;
- Lack of properly skilled human resources and an ageing workforce;

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40 Data in this section is derived from :
1) Basic facts and figures: Eurostat,
2) External competitiveness: World exports - UN Comtrade Year Book 2007 (to which intra EU-27 trade was deducted). Figures were cross checked with Eurostat Extra EU-27 exports + EUROSTAT (EU main international partners),
3) Financial crisis related data from Eurostat.

41 NACE 19.3

- Lack of investment capability.

The *opportunities* are:

- Increasing demand for high quality and aesthetic products in emerging markets;
- Rapidly changing and volatile demand (fashion) requiring shorter product lifecycles and multiple collections per year.

The *threats* are:

- High competitive pressure from non-EU producers (e.g. China) and from distributors;
- Increased power of large retailers, which puts pressure on prices. Retailers are increasingly sourcing in low cost countries;
- Risk of locating new investments outside Europe;
- Protectionist tendencies, in particular trade barriers in certain key markets;
- Illegal copying of designs and models.

The challenges faced by EU footwear producers are similar to other industrial sectors, where the major factors of competitiveness are research and innovation, skills and quality, design and value-added, knowledge and know-how, together with better access to third country markets.

R&D and innovation

The main technological challenge for the footwear industry is to focus on higher value-added and eco-efficient and sustainable products, processes, materials and organisations. A significant effort on research and skills is needed in order to achieve these objectives. New business models, new materials and enhanced manufacturing processes are required. Initiatives at EU level, such as the integrated project for the CEC-made shoe (custom, environment, comfort) under the 6th RTD Framework Programme are already underway and cover many of these aspects.

Knowledge and skills

In the period between 2000 and 2006, there were changes in occupational structures in the textile, clothing and leather industries, which included footwear. The relative proportions of low, medium and highly qualified personnel have changed. Furthermore, many enterprises are experiencing difficulties in recruiting staff that is suited to the new needs of the sector. The growing use of new technologies and the internationalisation of activities require new competencies, such as language skills, negotiating skills (e.g. for contracts with international partners), supply chain management, legal skills (for intellectual property protection), etc.

Market structure: Competition

The sector is characterised by a high level of competition among micro companies and SMEs with a low level of concentration (since 1990, only one merger has been subject to Commission scrutiny). The issue of consolidation does not appear to be on the agenda for this

sector (few consolidation initiatives in sports footwear). On the contrary, under the pressure of international competition, large companies are tending to disappear, while small and flexible production units organised in clusters are better able to maintain their competitive position. The number of enterprises in the sector has gradually decreased, by more than 20% over the last ten years. Therefore the sector has been rarely concerned, if at all, by merger and anti trust legislation. However, there is a growing concentration on the distribution of footwear products. There is no sector-specific legislation on State aid. Given the size of the enterprises concerned and their low level of absorption of State aid, the sector has not been directly concerned by the EU State aid policy.

Market structure: Regulation

There is one sector-specific directive for the footwear sector, namely *Directive 94/11/EC* on the approximation of the laws, regulations and administrative provisions of the Member States relating to labelling of the materials used in the main components of footwear for sale to the consumer. Other legislation affecting the textiles industry is of a horizontal nature, covering the environment, social and employment issues, and the internal market. The EU footwear industry has problems with protection of designs and brands. There needs to be an improvement not only in the implementation of the relevant legislation throughout the EU, but also in the enforcement of international agreements by EU trade partners. Furthermore, there is a need to raise the awareness of right-holders, in particular SMEs, as to how they can protect their rights, both in the EU and in third countries.

Environment

Footwear manufacture *per se* cannot be considered as having a heavy impact on the environment. Most of the problems are associated with the upstream industries (leather and plastics). However, the new chemicals Regulation, REACH, would involve user obligations downstream. The issue of waste management (i.e. disposal of the shoe when it is no longer used) is likely to be the problem that warrants the most immediate attention in terms of the environmental challenges facing this industry. An Eco-label was established for footwear in 1999. It applies to all categories of shoes, including sports shoes, occupational shoes, children's, men's and women's town shoes, specialist shoes for cold weather, casual, fashion and indoor shoes. So far, the Eco-label has been awarded to nine footwear manufacturers in three countries (Spain, Italy and Sweden).

External competitiveness

China is the world market leader with 44% of world exports (2007, figures in value and excluding intra-EU trade); the EU is next in line with 13% (in value, and excluding intra-EU trade). In five years the trade deficit has more than doubled to €7.16 billion (EU-27, 2008). Nowadays, imports account for more than 76% of the EU demand, compared to only 57% in 2001. The main suppliers to the EU market are China (45.6% of imports value in 2008 compared to 32% in 2004) and Vietnam (17.2%). The US (17.6% of EU exports in 2008), Russia (17.5%) and Switzerland are the main destinations of EU footwear. Reasons contributing to the big trade deficit include the growing difficulty of EU industry to compete with low labour costs and less regulated countries, and the strength of the Euro. Increased market access to emerging economies, where the middle classes are growing, is of strategic importance as these represent a quality-conscious market, where the EU has the greatest competitive advantage. In addition, the continued existence of various different non-tariff barriers (NTBs) in the area of the footwear industry is a significant disincentive for SMEs to

participate in and benefit from international trade. Based on an analysis of market access and of the NTBs notified to the WTO, carried out by the Commission services, a number of main barriers have been identified which are of relevance for the multilateral negotiations on non-agricultural market access (NAMA). Specifically, the EU has proposed harmonisation and greater transparency with regard to barriers due to labelling, certification of conformity procedures, export restrictions, registration of importers, etc. As mentioned above, counterfeiting and piracy are problems for the European footwear industry.

Employment and geographical dimension

The footwear industry is a labour intensive industry and can only be partially automated. Employment is concentrated in the smallest enterprises, while big companies of more than 500 employees account for less than 15% of the workforce in the sector. This contrasts with the manufacturing sector in general, where the biggest companies employ 33% of the workforce. It is interesting to note that the enterprises with less than 20 employees have the second highest productivity level. The highest productivity is found in the group of companies having between 500 and 1000 employees, while the large companies with more than 1000 employees have the lowest level of productivity. In Italy, which is by far the biggest footwear producer in the EU, 60% of value added is produced by enterprises employing less than 20 people. The Italian footwear industry, which is characterised by a network of small and micro enterprises with a high level of subcontracting, has no enterprises with more than 100 employees. This industrial model seems to be the best suited to the comparative advantages of the EU industry. Spain and Portugal have a very similar production structure (although, in Portugal, companies with more than 500 employees still manufacture 20% of its production). The footwear sector was one of the first industrial sectors to set up a European joint committee (1982), replaced and expanded with a European sectoral social dialogue committee in 1998. Through this dialogue European social partners contribute to improving working conditions, addressing the challenges of managing change in a context of rapid transformation, and monitoring the economic and social impact of trade policies.

Areas of growth (within the sector)

The biggest growth potential is concentrated in products at the high-end segment of the market. This is the case, for instance, with very high quality and aesthetic products, or shoes for specific uses, which are using new materials.

Response to structural change

The footwear industry has undergone extensive restructuring and relocation over the past two to three decades. Some companies have outsourced the lower added value phases of the production processes to other countries, while maintaining control of the key phases of production. Furthermore, companies are attaching increased importance to the control of fixed costs, optimisation of the production process (e.g. reduction of lead times), and are introducing ICT tools (e.g. logistics), investing in Research and Development and diversifying their activities.

Structure of sector

By far the majority of the enterprises in the sector are micro enterprises, but there are some large manufacturers too. Retail, distribution, marketing and branding are increasingly

controlled by large multinational companies with the capacity to source massively on the global market.

Sector-related services

Sector-related services concern computer design and production services, as well as access to finance for technological and non-technological innovations.

Vulnerability to financial crisis

The main effects of the financial crisis on the EU footwear industry are reduced access to credit (especially for SMEs) and lower domestic and international demand. Access to credit was already a problem for the sector. The worsening of the economic situation is liable to affect the day-to-day running of the business and, in the long run, reduce investment in research and innovation. A drop in consumer confidence and spending is having a high negative impact on consumer goods such as footwear.

14. FURNITURE[42]

Basic facts and figures on the sector

The European furniture sector[43] comprises around 150,000 companies, generates a turnover of €126 billion and €38 billion of added value and employs around 1.4 million people (EU27, 2006). The main producers (in terms of production value) are Italy and Germany, followed by UK, France and Spain and, to a lesser extent, Poland. The sector is dominated by micro enterprises (86% of the EU furniture enterprises have fewer than 10 workers), but there are also some large manufacturers. Over the years, and in response to competitive pressures, furniture companies have undertaken a lengthy process of restructuring and modernisation. More recently, production volumes dropped, mainly due to increased international competition, and jobs were lost due to both the drop in production and the growing automation of production processes. Although production volumes increased slightly from 2005 on, this positive/stabilisation trend came to an end in 2008, and the sector registered a 3.5% fall in production. The negative growth has started with a slight decrease in the second quarter of 2008 and it has accelerated afterwards to reach -11.9% in the 4th quarter and -18.6% in the first quarter of 2009.

Competitiveness assessment

The main *strengths* of the sector are:

- It is a mature and dynamic sector in which there is a high quality of production in technical, aesthetic, design and fashion-related terms;
- It has undergone a restructuring in the last decades and has developed significant technological advances and business model innovations;
- It has a strong image worldwide and has established markets within and outside Europe.

The main *weaknesses* are:

- High costs as compared with Asian competitors;
- Lack of properly skilled human resources and an ageing workforce;

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42 Data in this section derived as following:
- Basic facts and figures / Eurostat (values updated for 2006)
- Knowledge and skills (DG Employment study - Jobs and competences in the furniture sector in the EU: future scenarios and competences, not yet published: source of the figures: Eurostat+Alphametrics+TNO
- External competitiveness: World exports : UN Comtrade Year Book 2007 to which intra EU-27 trade was deducted. Figures were cross checked with Eurostat Extra EU-27 exports + EUROSTAT (on EU main international partners)
- Employment and geographical dimension (most of it Eurostat facts and figures, the part on job losses reported from Industry were in previous report)
- Financial crisis – from Eurostat

43 NACE 36.1

- Lack of investment capability.

The *opportunities* are:

- Increasing demand for high quality and esthetical products in emerging markets;
- Increasing demand for environmentally friendly and safe products;
- Increased demand for top end products as incomes rise.

The *threats* are:

- Growing competition, particularly from China;
- Risk of locating new investments outside Europe;
- Protectionist tendencies, particularly trade barriers in certain key markets;
- Increased costs of compliance with environmental and safety regulations;
- Illegal copying of designs and models.

EU furniture producers are constantly upgrading their products. However, customer demand is increasing too and countries with lower production costs are constantly improving their quality and expanding their product range. EU furniture producers are therefore faced with similar challenges to those of other industrial sectors, where the major factors of competitiveness are research and innovation, skills and quality, design and value-added, knowledge and know-how, as well as better access to third country markets.

R&D and innovation

The furniture sector is a mature sector, where innovation is crucial to sustaining market growth. The industry is therefore innovating at the level of products and production processes. A growing number of firms are automating their business processes, improving cooperation networks with their business partners, and using ICT tools (e.g. computer aided design or manufacturing and e-business). Many firms are upgrading their products in terms of design, style and new utilitarian functions, and are also using new materials and developing safe and environmentally friendly products. Research activities at EU level, covering both the wood and non-wood based sub-sectors of the furniture industry, could improve the sustainability and competitiveness in terms of business models, new materials, and enhanced manufacturing processes, etc.

Knowledge and skills

Between 2000 and 2006, following a global trend of upgrading skills and competencies, the sector saw a decrease in the proportion of low qualified employees and a corresponding increase in the proportion of medium qualified employees. In 2006, 31% of workers were low qualified, 58% medium qualified and 11% highly qualified. Many enterprises are experiencing difficulties in recruiting staff suited to the new needs of the sector. The growing use of new technologies and the internationalisation of activities require new competencies,

such as language skills, negotiating skills (e.g. for negotiation of contracts with international partners), supply chain management, legal skills (for intellectual property protection), etc.

Market structure: Competition

The sector is mainly made up of SMEs, usually specialised in manufacturing one type of furniture only. Since 1990, only one merger case has been the subject of Commission scrutiny. The upstream market is highly concentrated, and a large proportion of clients exercise significant buyer power. The sector falls under horizontal State aid rules and is not covered by sector-specific State aid legislation.

Market structure: Regulation

There are no sector specific directives for the furniture sector, although there are several horizontal directives - covering the environment, social and employment issues and the internal market - that do have an impact on the industry.

Environment

The main environmental directives which directly affect the furniture industry are those related to industrial emissions – Directive 2008/1/EC on Integrated Pollution Prevention and Control (IPPC) and Directive 1999/13/EC on the limitation of emissions of Volatile Organic Compounds (VOC) due to the use of organic solvents in certain activities and installations – and those related to waste – Directive 91/689/EEC on Hazardous Waste (e.g. hazardous wastes such as varnishes) or Directive 94/62/EC on packaging and packaging waste. A growing number of furniture manufacturers are implementing environmental management schemes (e.g. EMAS) in order to monitor and continuously improve their environmental performance. In addition, an EU Eco-label for wooden furniture is under discussion. Moreover, the furniture industry is a downstream user of chemicals and as such has obligations under REACH. This industry has expressed concerns that it could face significant adaptation costs and time-to-market problems if substances used for specific purposes are withdrawn. However, REACH could also bring business benefits and innovation through the increase in knowledge about chemicals.

External competitiveness

The EU furniture industry is a major player on the global market, accounting for close to 19% of world furniture exports in value terms (2007 figures, excluding intra-EU trade). However, under pressure from low labour cost competitors, in particular from Asia, this position has recently deteriorated. Trade in furniture products has traditionally recorded a surplus. However, the balance has deteriorated dramatically from a surplus of almost €3 billion in 2002 to a deficit of €1.2 billion in 2008. This is the result of an impressive improvement in China's performance. In 2000 China’s share of EU imports was less than 15%, whereas in 2008 China accounted for 50.7% of EU imports. Other less important third country suppliers are Vietnam (5.4%), Turkey (5.3%) and Indonesia (5.1%). In contrast, the main markets for EU exports are the US (16.3% in 2008), Switzerland (15.1%) and Russia (14.2%). As a result of previous WTO agreements, EU tariffs are already fixed at zero or close to zero, while some developing countries that are major producers of furniture, such as India, Brazil or Indonesia, have maintained their tariffs at high levels. The trade balance with these countries is increasingly negative. At the same time, an increasing proportion of the population in these countries can now afford EU products. Market access improvements are fundamental to this

sector in the context of the WTO negotiations. Russia's accession to the WTO should also improve access to an important market**.** Counterfeiting and piracy are problems for the industry as a whole. Concerted action between industry and public authorities is called for.

Employment and geographical dimension

In terms of employment, furniture continues to be a labour intensive industry. In recent years, a decrease in production led to a drop in employment. Official figures available for some Member States for the furniture sector also show falls ranging from 1.8% in Spain to 15.4% in Germany. According to Eurostat figures, the apparent labour productivity in the furniture sector in 2004 was €25,700 per person employed, which was well below the non-financial business economy average (€40,900). Average costs per employee were also relatively low at €20,600. The sector employs a relatively small proportion of women (28.6%) compared to the non-financial business economy, and, as with other manufacturing sectors, almost 25% of the workers are over 49 years of age.

Growth areas (within the sector)

Products focusing on the high-end segment of the market have the biggest growth potential. This is the case for top quality and aesthetic products using new and innovative materials. Another area of growing importance is eco-sustainable manufacturing.

Response to structural change

As a response to competitive pressures, furniture companies have undertaken a lengthy process of restructuring and modernisation. The average size of enterprises is increasing, which shows that a concentration process is taking place in the furniture industry. Manufacturers are expanding their plants, building new ones or acquiring other enterprises. They are increasingly investing in ICT, customisation of product lines, reduction of lead times, and cooperation with their partners along the value chain. They are also introducing innovations in production processes and upgrading human resources skills.

Structure of sector

By far the majority of enterprises in the sector are micro enterprises, but there are some large manufacturers too. Small companies often act as subcontractors for larger firms producing, for instance, components and semi-finished products for finishing and assembling furniture. With the exception of some large manufacturers, the production and distribution of furniture is often carried out by individual firms. Most manufacturers sell their products to specialised retailers.

Sector-related services

These services are related to the abundance of skilled workers, computer design and production services, and access to finance for non-technological innovations.

Vulnerability to financial crisis

The principal effects of the financial crisis on the EU furniture industry are lower domestic and international demand and a reduced access to credit (especially for SMEs, which dominate the sector). A fall in consumer confidence and spending has a negative impact on consumer goods in general and in furniture in particular. Furniture is a discretionary item and

therefore furniture industrial production is cyclical. Furthermore, the worsening of the economic situation is likely to affect the day-to-day running of the business and, in the long run, reduce investments in research and innovation.

15. GLASS[44]

Basic facts and figures on the sector

The European glass industry employs around 220,000 people and is made up of a number of distinct sectors, manufacturing products for a wide range of uses. The sectors are container glass, which accounts for about 60% of output, flat glass (30%), tableware, fibres for reinforcing and insulating applications, special glass, and glass frits used in glazes for ceramic products. Total production in EU27 in 2007 is estimated to have reached just less than 35.5 million tonnes, slightly up on 2006. This represented about 30% of total world glass production. It was worth almost €39 billion, representing about 32% of the value of total world production. Glass production is a very energy-intensive process, with energy costs as a share of total costs ranging from 6-8% in the labour-intensive crystal sector to around 20% in the highly automated container and flat glass sectors. Energy consumption overall has been reduced by about 1% per year since 1990, but further progress is likely to be limited. The glass industry is being evaluated for possible carbon leakage in the third phase of the application of the emissions trading scheme.

Competitiveness assessment

The glass industry's principal *strengths* are the existence of several large EU-based companies competing on world markets, the exploitation of economies of scale, the high quality of its products, its capacity for high technological innovation, and its skilled labour force.

Its main *weaknesses* are that the production process is highly energy intensive and at a very mature stage, whereas its capacity for improving efficiency and reducing CO_2 emissions is limited. High start-up costs and tied distribution channels in some sub-sectors may hinder innovation, production facilities are capital intensive and require long investment cycles, and in some sub-sectors product ranges are very diverse, making it difficult to obtain a sufficiently high production volume to secure adequate profit margins.

Its principal *opportunities* are new market openings, increasing demand for innovative and specialised products, especially in the field of energy saving and environmental protection, process and product development resulting from increased R&D. In addition, opportunities arise from the liberalisation of EU energy markets, the switch from fossil to non-fossil energy, mergers and acquisitions improving labour productivity, stronger IPR enforcement, and glass fibre substituting metals and wood via composites.

The main *threats* include global competition and consolidation, competition from low-cost countries, downstream bargaining power and increasing demands to cut costs, production over-capacity in some sub-sectors, increasing energy prices and lack of security of supply, increasing environmental regulation, substitution by other products, third country trade barriers, and counterfeiting of European designs.

R&D and innovation

[44] NACE 26.1

Investments by the EU glass industry in R&D have resulted in a great deal of innovation in glass processing in recent years, principally as a result of seeking IPPC compliance, and in the quest for maximum energy savings in the face of soaring power prices. In addition, there has been significant product innovation in the EU glass industry: advanced technology, high-performance double glazing makes possible the reduction of energy consumption and CO_2 emissions, the invention of self-cleaning glass and various applications in the automotive sector. In order to compensate for the loss of the TV glass segment, the special glass industry is working on becoming a solutions provider by complementing special glass products with other materials like plastics or ceramics, and innovative products in the container sector which include lightweight glass. Glass fibres for reinforcement are basic to the manufacturing of many lightweight products used in the construction and road/sea/air transport industries, not forgetting the developments in the manufacturing of wind turbines for green energy.

Knowledge and skills

Glass manufacturing technology is at a mature stage where production in most sectors is highly automated. It is unlikely that there will be many very significant process changes to the current level of technology in the near future. The sector has a well trained and experienced workforce and constantly improving productivity, but it remains to be seen whether it can continue to attract workers with the necessary skills.

Market structure: Competition

The biggest glass producers in the EU are the four big flat glass groups, most of them under non-EU control, which operate globally, and control over 80% of the European flat glass market between them (production of flat glass in 2007 accounted for 29% of the total output in tonnage terms). Amongst the five biggest is the largest EU container glass producer, which is now US-owned. Market shares have been relatively stable in most sectors, although in 2007 the EU became a net importer of glass products for the first time (huge increases in imports from China and, to a lesser extent, from Turkey). The number of operators in most sectors does not fluctuate much, although there have been significant closures in the domestic glass sector due to pressure from ever-increasing quantities of low price imports. Barriers to entry include high capital intensity and regulation. The Commission has never prohibited any mergers and has approved only four mergers with remedies, in the flat glass and glass fibre sectors. Flat glass producers have complained unofficially on a number of occasions about state aid being granted to plants in the eastern part of Germany, but in each case, these have been found to be within the rules. On 28 November 2007, the Commission adopted a decision imposing fines of a total of € 486.9 million on flat glass producers Asahi, Guardian, Pilkington and Saint-Gobain for coordinating price increases and other commercial conditions for deliveries for construction applications within the EEA. On 12 November 2008, the Commission adopted a decision imposing fines of a total of € 1 383.9 million on car glass producers Asahi, Pilkington, Saint-Gobain, and Soliver for allocating customers and stabilising market shares within the EEA.

Market structure: Regulation

Only one piece of legislation relates directly to the glass industry: Directive 69/493/EC on the approximation of the laws of the Member States relating to crystal glass, which covers a very small part of the glass industry overall. Other legislation concerning the glass industry is of a horizontal nature, relating to environment, consumer protection and employment issues, and

the internal market (a list of flat glass standards was published in the Official Journal in 2005 under the provisions of the Construction Products Directive).

Environment

The following environmental legislation affects the glass industry:

- Directive 94/62/EC on packaging and packaging waste
- Directive 2008/1/EC on integrated pollution prevention and control (IPPC)
- Directive 2002/95/EC on the restriction of certain hazardous substances in electrical and electronic equipment
- Directive 2000/53/EC on end-of-life vehicles
- Directive 2002/96/EC on waste electrical and electronic equipment
- Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community
- Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation, and restriction of Chemicals (REACH) and establishing a European Chemicals Agency
- Directive 2002/72/EC relating to plastic materials intended to come into contact with foodstuffs.

The issues related to environment are the following:

- process waste is usually recycled back to the furnace, but for quality reasons there is a limit to the amount that can be recycled in sectors such as flat glass and glass fibre. In the special glass sector, where traditionally the biggest product sector has been glass for TV screens and computer monitors and for cathode ray tubes, recycling has been more difficult. However, it is much less of an issue now that these products are virtually no longer produced in the EU and their flat screen replacements are mainly produced in South-east Asia. The issue of waste for the fibre sector is that when fibre becomes waste, it is in the form of composite material from which it can not be separated and which currently can not be recycled. Along with other composite materials manufacturers, the fibre industry is exploring ways of recycling, but the economic costs are prohibitive at this stage;
- the main issue on recycling concerns the container glass industry, which is covered by Directive 94/62/EEC on packaging and packaging waste. Industry has no difficulty in meeting recycling targets, but would have difficulty in meeting the maximum lead contents of 100 ppm, from which it has secured an open-ended derogation.
- emissions to air from the glass production process are in the form of particulates, oxides of sulphur and oxides of nitrogen. Emissions are fairly homogeneous in the melting phase of all branches of the glass industry, but tend to vary widely as far as downstream processing is concerned. These arise from processes, such as, application of coatings, or from secondary processing operations such as cutting or polishing. Such emissions are covered

by Directive 2008/1/EC on integrated pollution prevention and control (IPPC), and in the best available techniques reference document (BREF) adopted by the Commission in December 2001, which is currently being revised

- REACH has an impact on the glass industry because it entails extra requirements linked to the communicating on the safety of chemicals used along the supply chain, and it may be that some of small quantities of chemicals it uses in components, such as, glazes will disappear from the market rather than being registered.

- following the adoption of the emissions trading scheme with the aim of reducing CO_2 emissions at least cost, the EU glass industry fears being put at a severe disadvantage compared to third country competition. For this reason, an evaluation of the risks of carbon leakage is being carried out. The possibility of industry world-wide achieving an agreement in the area of CO_2 emissions might provide a level playing field to avoid the risks of carbon leakage.

- glass manufacturing technology is at a mature stage, and further savings in energy consumption are likely to be limited. Certain sectors could increase their use of cullet (treated glass scrap), but this is not always possible for technical reasons. On the other hand, demand in the flat glass and insulating glass sectors can be expected to grow dynamically once EU provisions on the energy performance of buildings starts to have an effect.

External competitiveness

About 80% of output is traded with other Member States. The figure for extra-EU trade is much lower, and EU exports were double the tonnage of imports into the EU in 2003. By 2007, this had changed to a situation whereby the EU (27) was a net importer, due principally to a massive increase of imports from China and Turkey. There are many countries, which the EU glass industry sees as having trading potential, where there are high tariff barriers. These include India, Argentina and most countries in Southeast Asia. Import tariffs on tableware in the USA are still amongst the highest in the world, despite its position as the EU's number one destination for this product. In addition, there are a number of non-tariff barriers, such as the introduction of compulsory testing and certification schemes, which is beginning to be seen in countries like Turkey, and the bans of imports of certain products into countries such as Syria where there is a strong domestic production. Other non-tariff barriers have been reported in several other countries. An important issue for the Commission in international and bilateral negotiations is to push for the abolition of peak tariffs in third countries, where EU ceramics and glass manufacturers can see potential for their products.

Employment and geographical dimension

Total numbers employed in EU27 in 2007 were almost 220 000, 5% down on 2005, the first year for which figures were available on an EU 27 basis. In 1980, in EU12, employment stood at 299 000. The biggest employer continues to be Germany, followed by Poland, the Czech Republic, and France. With one or two exceptions, there appears to be no production in the Baltic countries or Cyprus and Malta. The fall in terms of employment was driven largely by productivity requirements, increasingly automated production lines, industry consolidation, and new low-cost competition. In terms of output, 70% of all glass was produced in just five Member States: France, Germany, Italy, Spain and the UK.

Growth areas (within the sector)

All sub-sectors have shown slow growth over recent years, although overall growth in total glass production is related in the main to successive EU enlargements. In terms of products, growth areas include high performance flat glass and fibres in a search for reduced energy consumption, container glass although there could be issues in some Member States on lighter packaging, and the luxury end of the table and ornamental ware sector.

Response to structural change

There has been a significant amount of rationalisation and repositioning in the glass industry, not only at European level, but also globally. There are limits to how far this can go without risking to weaken competition, for example in the flat glass sector, which is already very concentrated.

Structure of sector

The main sub-sectors are becoming controlled by a few large companies, operating globally, mainly due to pressure to reduce costs to remain competitive in a fierce, cost-driven, global market. The flat glass market, for instance, is dominated by 4 groups, only one of which remains EU-owned. Very few SMEs remain, many in the tableware sector having closed down due to competition from low-priced imports and the cost burden imposed notably by environmental legislation. There are some smaller independent companies in the container glass sector, which continue to compete effectively due to the existence of regional and niche markets.

Sector-related services

As with many other industrial sectors, the glass industry outsources certain services to external firms, for example in the fields of transport, IT, etc, but there is no overall pattern. On the other hand, the glass industry itself provides a number of services to its customers, such as self-cleaning and anti-bacterial flat glass. Other ways of reducing energy consumption include the use of high performance double glazing products, photovoltaic glass, insulating fibres, low-energy light bulbs, etc. The industry provides a service to automotive manufacturers by supplying automotive glass parts already with add-ons, such as the wiring for rear screen heaters, aerials, etc.

Vulnerability to financial crisis

The principal effects of the financial crisis on the EU glass industry are associated with the higher costs of capital, reduced access to credit and lower demand from user industries both in the EU and in traditional export markets. Reduced demand in the construction and automotive industries, which appear to be the hardest hit glass-consuming sectors, is having a significant negative impact on sub-sectors such as flat glass and fibres, which are mainly dependent on these two sectors.

On the other hand, as the effects of the fall in consumer confidence and spending have started to bite, there has been a significant fall in demand for products such as tableware and container glass, especially at the luxury end of the range. Tableware is traded on global open markets, and there is a high level of trade intensity which makes it particularly vulnerable. This has already resulted in serious difficulties for several EU companies.

Not only is the glass industry a capital-intensive industry, it is also highly energy-intensive, so the cost of fuel has a major impact on its competitiveness position.

As domestic demand falls in emerging economies, increasing competitive pressure is being seen from their glass producers on EU markets, and also on EU producers' traditional export markets, as producers seek new outlets for their production. There has already been a surge in imports of flat glass from China, for instance, and the pressure can be expected to grow.

16. ICT INDUSTRIES[45]

Basic facts and figure[46] on the sector

The ICT sector, as a whole, employs 6.6 million persons across the 27 EU Member States[47]. This is in line with OECD figures, which show that more than 15 million people were employed in the ICT sector in OECD countries in 2006. Europe-14 has 35% of the OECD employment, which is equivalent to 5.250.000 persons (see OECD IT Outlook 2008). The total number of ICT-related employment is assumed to be much higher, because a significant number of employees in ICT departments within entities are not counted in these figures. Among the 6.6 million people employed in ICT industries in the EU27, 1.6 million (or 24.5%) work in the ICT manufacturing sector, whilst 5.0 million (equivalent of 75.5%) are employed in the ICT services sector[48].

Software has an 11 % share, IT services 21 % and carrier services 44% of the total ICT sector. The bulk of the ICT sector, i.e. telecommunications services firms, is slowing down as core markets stagnate or even decline. Their growth areas are new services (mobile and fixed broadband services).

The EU ICT sector (manufacturing and services) was worth €670 billion in 2007 and represents around 5.3% of total GDP in the EU. However, it accounts for a much larger share of overall productivity growth thanks to the important role that ICT plays as an enabling technology and in boosting innovation throughout the economy. It should also be borne in

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45 ICT Definition based on NACE Rev 1.1:
Manufacturing: Office, accounting and computing machinery (NACE 30.01 and 30.02); insulated wire and cable (NACE 31.3); electronic valves and tubes and other electronic components (NACE 32.1); television and radio transmitters and apparatus for line telephony and line telegraphy (NACE 32.2); television and radio receivers, sound or video recording or reproducing apparatus and associated goods (NACE 32.3); instruments and appliances for measuring, checking, testing, navigating, and other purposes, except industrial process equipment (NACE 33.2); industrial process equipment (NACE 33.3).
Services: wholesale of electrical household appliances (NACE 51.43); wholesale of machinery, equipment and supplies (NACE 51.64); wholesale of other machinery used in industry, trade and navigation (NACE 51.65); telecommunications (NACE 64.2); renting of office machinery and equipment including computers (NACE 71.33); computer and related activities (NACE 72).

46 Data in this section is mostly derived from the OECD Information Technology Outlook 2008. Other sources might provide different figures. However the trend shown by for ex Eurostat figures is similar to the one by OECD.
Notes: (1) Size is % value-added at current prices in the EU15 – source: Groningen Growth & Development Center (GGDC) – 60 Industry Database; (2) share of ICT valued added in business sector value added – EU14 – source: OECD Information Technology Outlook 2008; (3) annual growth of market value in % - source: EITO 2008; (4) R&D in 2002-2003-source: Commission services; (5) 2004 - EU: EUROSTAT Community survey on ICT usage – EU 15; US: Business in the information age (6) Annual average 2000-2004 - EU15 - source: GGDC- Total Economy Growth Accounting database; (7) average annual growth rates in % - EU15 - source: B. van Ark and R. Inklaar (2005); (8) % of companies having introduced innovations in previous 12 months – EU 15 – source: European Commission - 2004 eBusiness W@tch. and DG Information Society and Media i2010 Innovation and Investment in R&D.

47 Van Ark: EU KLEMS Growth and Productivity Accounts, 2007.

48 Eurostat, 2008 and ENTR.D4 calculations.

mind that technical components "embedded" within plants or other technical equipment do not show up as ICT capital in data used.

Value added in the ICT sector increased as a share of business sector value added in the EU14[49], despite the downturn in the early 2000s. The share of the ICT sector increased from 7.2% in 1995 to 8.15% in 2006. The largest shares are in Finland and Ireland (both over 12%) and the smallest in Greece (below 6%). Increasing shares were most noticeable in Finland, Hungary and the Czech Republic, as well as in Korea. The share of the ICT value added in the US declined from 9.1% in 1995 to 8.7% in 2006. Despite this small decline, the United States still has around 40% of the ICT value added in the OECD area, the EU14 around 30% and Japan 12%. (*OECD Information Technology Outlook 2008).*

Competitiveness Assessment

A prime driver of growth in the ICT manufacturing sector has been the increasing demand for ICT services (stimulated by both private consumption and public sector planning) and a diversified supply of these services. The development of a strong ICT sector (encompassing both manufacturing and services) contributes to the wider adoption and efficient usage of ICTs by other sectors in the EU, thus increasing productivity growth in the overall economy. By the same token, policies that aim at a wider and more efficient uptake of ICTs have a clear indirect impact on the competitiveness of the ICT sector. Factors that increase the quality of products in the ICT sector are the availability of highly skilled labour, significant and long-term investment in R&D and innovation, more sophisticated material inputs and superior organization at the plant or firm level. As ICT is a General Purpose Technology (GPT), its indirect impact on competitiveness is essential.

The average profit margin of the top 250 ICT firms was 7.7% in 2006, compared with 8.5% in 2000 (i.e. average net income over average revenue, to account for missing data). Average margins in 2006 are highest among software, Internet and semiconductor firms, with 23%, 15% and 12% respectively, while telecommunications services and communications equipment firms achieved average margins of 8.9% and 8.2%, respectively *(see OECD Information Technology Outlook 2008).*

In the EU, the ICT sector prompted a 0.4% productivity growth during the period 2000-2004, which accounted for about one quarter of the overall productivity increase (See European Commission SEC (2007) 1472). However, the contribution of this sector in the EU is lower than in the US, both because the size of the ICT sector is smaller (5.3% of GDP in the EU as against 6.6% in the US) and because efficiency gains in the EU ICT sector were lower than in the US (5% as against 6.2%). The contribution of the ICT sector to overall productivity growth in Japan is similar to that in the EU: despite a larger weight in the total economy, productivity growth in the ICT sector was slower than in the US. Moreover, increasing productivity is only one aspect of company performance to which ICT can contribute. An advanced e-business strategy can be crucially important for companies' presence in global markets, without necessarily increasing their productivity.

Overall, some parts of the ICT sector can be considered to be of strategic importance, given its enabling character and its potential to drive innovation and improve competitiveness and

[49] Note: EU14 comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and the United Kingdom.

effect economic and social change. The contribution of the EU ICT industries can be considered to be strategic for the competitiveness of leading downstream industries, such as automotive, telecoms, machine tools, aerospace, medical equipment, energy efficiency and defence. For these sectors, in particular, the presence of specialised SMEs in EU territory can be considered to be of particular importance.

Broadband is essential for the whole economy as it provides the basis for high-speed communication and IT usage. Furthermore, modern broadband networks can help bridge divides between rural and urban economies as well as between rich and poor regions. For all these reasons the Lisbon agenda and i2010 rightly identified ICT as a key part of the strategic infrastructure of the knowledge based economy. It has been generally acknowledged in numerous studies that productivity growth is strongly linked to ICT usage and broadband networks in particular (see, for example, e-Business Watch 2008 and i2010 High level group (2006), "The economic impact of ICT: evidence and questions")[50].

Although firms continue to use ICT to improve process efficiency (mainly conceived as ICT for cost-cutting), ICT services are increasingly recognised as an important tool for innovation and increasing revenues by enabling new services and new ways of working within value networks. According to a study by the IT and Innovation Foundation[51], "Money spent on computing technology delivers gains in worker productivity that are three to five times those of other investments".

R & D and innovation

ICT sector overall

The ICT sector is innovative and undertakes major investments in knowledge, with R&D expenditures and the number of patents exceeding those of other industries. ICT R&D also spills over into many other products and industries. Hence, boosting investment in ICT research is critical to the competitiveness of EU economies. R&D expenditures of the top ICT firms are growing consistently and holding up well during downturns.

The ICT industry undertakes a considerable amount of foreign R&D investment. ICT firms and public research organisations have increasingly internationalised their activities and are present with R&D laboratories or linkages in many foreign locations. Despite this increased tendency, the ICT sector's R&D activities are less internationalized than those of some other large sectors. Most ICT firms still conduct the bulk of their R&D in their home country. Only around 12% of business ICT R&D in the OECD in 2005 was under foreign control. Most international R&D relationships are between affiliates and headquarters rather than between domestic and foreign owned ICT firms or laboratories. The R&D intensity of affiliates abroad is far lower than for the firms in the home countries. Globalised business ICT R&D networks are still limited in number and mostly concentrated in big firms *(OECD Information Technology Outlook 2008).*

The ICT sector is also one of the most R&D intensive industries, with the R&D expenditures of the top ICT firms growing consistently and holding up well during downturns. The biggest

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50 http://ec.europa.eu/information_society/eeurope/i2010/docs/high_level_group/note_on_economic_impact_of_ict.pdf

51 www.itif.org.

share of R&D activities remains within the US, EU and Japan, even though south-east Asian countries like Korea are investing heavily in ICT R&D. R&D expenditures in the US ICT industry continue to exceed R&D investments in the EU15. However, the research gap between the US and the EU has been narrowed somewhat in recent years. R&D expenditure related to ICT industries increased in the EU15 from €26.7bn in 2003 to €29.3bn in 2005. During the same period R&D related investments in ICT in the US fell from €57.4bn to €50.3bn[52]. As regards R&D expenditures in ICT manufacturing and services, the EU-15 accounted for a little under one quarter of the total of all OECD countries in 2005 (OECD Information Technology Outlook 2008).

Important EU initiatives in the field of competitiveness, innovation and R&D include the following: the ICT-related strands within the Seventh Framework and Competitiveness & Innovation programmes (ICT Policy Support Programme), i2010 – a European initiative for growth and employment[53], the Communications "A Strategy for ICT R&D and Innovation in Europe: Raising the Game"[54]; "Pre-commercial procurement"[55]; 'e-Skills for the 21st Century: Fostering Competitiveness, Growth and Jobs', the e-Invoicing initiative , the discussion on the future of ICT standardisation, and the nine ICT-related technology platforms: ARTEMIS (Embedded Systems), eMobility (Mobile and Wireless Communications), ENIAC (European Nanoelectronics Initiative Advisory Council); EUROP (The European Robotics platform); ISI (Satellite Communications); NESSI (Networked European Software & Services Initiative); NEM (Networked Electronic Media); Photonics21 (Photonics) and EPoSS (Smart Systems Technologies). Two of these platforms (ARTEMIS and ENIAC) have since become Joint Technology Initiatives.

ICT manufacturing

Most of the R&D spending of the ICT sector is in manufacturing, particularly in the electronics and the IT equipment sectors, but semiconductor firms are the most R&D intensive and software firms have the highest R&D expenditure growth. The importance of ICT R&D for innovation has been recognised by firms and governments in the OECD. Research topics such as the physical foundations of computing, computing systems and architecture and network infrastructures remain priorities. ICT R&D in a given area tends to spur further innovation over time, which shows up in the emergence of new topics. For example, the miniaturisation of semiconductor technology has led to the involvement of nanotechnology research in ICT R&D, and higher requirements for broadband have been a driver for research in all-optical networks. These developments have also given rise to newly emerging ICT R&D clusters in Europe, where progress in other scientific disciplines such as biotechnology and nanotechnology is pushing trends of convergence between these fields of research. It is worth mentioning some important ecosystems related to semiconductors in Europe, such as Dresden, Dublin, Eindhoven / Leuven and Grenoble.

ICT manufacturing industries accounted for more than one quarter of total manufacturing business R&D expenditure in most OECD countries in 2004. It accounted for more than half in Finland and Korea, and more than one third in the United States.

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52 The decrease in the US R&D expenditure can be partially attributed to the fluctuation of the dollar-euro exchange rate.

53 http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm

54 COM(2009)116

55 COM(2007)799

ICT services

Innovation in ICTs has also impacted on the growing importance of digital content technologies in Europe. R&D expenditures continue to increase both in absolute terms and as a share of GDP. The ICT services and software development sub-sectors, in particular, have seen significant increases, compensating for falling R&D expenditure in the ICT manufacturing sectors.

Knowledge and skills

ICT sector overall

The competitiveness of the EU ICT sector could be further improved by progress in the discussions on introducing a single Community patent throughout the EU, by the plans to reduce the fees on Community trademarks and by a higher degree of interoperability for e-Government Services following the ongoing revision of the European Interoperability Framework. The development of attractive commercial offers of copyrighted contents, the enforcement of copyright on the Internet (a problem for which some Member States, such as France, UK and Germany, are working to find a solution), and the question of copyright levies on digital media such as CDs and DVDs (which is currently being discussed by stakeholders with the support of the Commission) remain major issues.

ICT manufacturing

Developing the EU's strengths would include the development of world-class R&D centres of excellence based on comparative advantages and close partnerships between academia and industry, as well as incentives to attract and retain top researchers and highly skilled labour. Examples of such ventures are the IBM-STMicroelectronics at Crolles, France and the Interuniversity Microelectronics Centre (IMEC) in Leuven, Belgium. Furthermore, important progress is already being made in implementing the long-term e-skills strategy proposed by the Commission in its Communication on e-Skills for the 21st Century and by the Competitiveness Council in its Conclusions of 22-23 November 2007. In order to keep ICT production in the EU, services need to be more knowledge-intensive, requiring highly focused R&D and skilled labour; venture capital should be encouraged and manufacturing should concentrate on R&D-intensive products with high quality and value added.

ICT services

The international sourcing of ICT services is a recent phenomenon resulting from developments in IT systems and broadband communications and the liberalisation of trade in services, with India as the main host country. A major feature of FDI is the availability of a favourable infrastructure and fiscal environment and a highly and appropriately e-skilled labour force.

Market structure: Competition

ICT sector overall

Since 1990, the ICT industries have experienced a large number of mergers, with the Commission investigating 393 cases, of which 21 have been cleared subject to remedies, and

three have been prohibited. Consolidation and restructuring of the sector is underway and some mergers and acquisitions could be expected in the future.

ICT manufacturing

There is a high level of concentration in the manufacture of office machinery, computers, microchips, radios, televisions and communications equipment, and also significant barriers to entry in some areas. The computer and related activities sector is composed mostly of SMEs, with low entry barriers.

ICT services

The telecommunications service industry was opened to competition in the 90s and is now based on more competitive market structures.

Microsoft holds a dominant position on the market for client PC operating systems. On 24.3.2004, the Commission found Microsoft guilty of abusing this dominant position and imposed an obligation to disclose certain interoperability information regarding work group servers as well as to market a version of its operating system Windows without its streaming MediaPlayer. The Commission also imposed a fine of €497 million. Both the remedies and the fine were upheld by the Court of First Instance in a judgment of 17.9.2007. On 12.7.2006 and on 27.2.2008, the Commission imposed penalty payments of €280.5 million and €899 million respectively on Microsoft for non-compliance with the 2004 decision.

Market structure: Regulation

ICT sector overall

Directive 1999/93/EC of the European Parliament and of the Council of 13.09.1999 on a Community framework for electronic signatures.

ICT manufacturing

Directive 2004/108/EC of the European Parliament and of the Council of 15.12.2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

Council Directive 73/23/EEC of 19.2.1973 on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits, as amended by Council Directive 93/68/EEC of 22.7.1993.

ICT services

Directive 1999/5/EC of the European Parliament and of the Council of 9.3.1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

Council Directive 1991/250/EEC of 14.05.1991 on the legal protection of computer programs

Directive 1996/9/EEC of the European Parliament and of the Council of 11.03.1996 on the legal protection of databases

Directive 2000/31/EC of the European Parliament and of the Council of 8.06.2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market.

Directive 2001/29/EC of the European Parliament and the Council of 22.5.2001 on the harmonisation of certain aspects of copyright and related rights in the information society.

Regulatory framework for the telecommunications sector

Directive 2002/21/EC of the European Parliament and of the Council of 7.03.2002 on a common regulatory framework for electronic communications and services.

Directive 2002/19/EC of the European Parliament and of the Council of 7.03.2002 on access to, and interconnection of, electronic communications networks and associated facilities.

Directive 2002/20/EC of the European Parliament and of the Council of 7.03.2002 on the authorisation of electronic communications networks and services

Directive 2002/22/EC of the European Parliament and of the Council of 7.03.2002 on universal service and users' rights relating to electronic communications networks and services.

Directive 2002/58/EC of the European Parliament and of the Council of 12.07.2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector.

Decision 676/2002/EC of the European Parliament and of the Council of 7.03.2002 on a regulatory framework for radio spectrum policy in the European Community

Proposals for a reform of the EU regulatory framework for electronic communications, 13.11.2007

The "Telecoms Reform Package", which was presented by the Commission on 13 November 2007, will change the EU telecoms rules of 2002. The package is expected to become law by the end of 2009 and includes the following main features: - A right for European consumers to change, within one day, fixed or mobile operator while keeping their old phone number; the right to transparent and better information; the "Body of European Regulators for Electronic Communications" that will help ensure fair competition and more consistency of regulation; Consumer protection against personal data breaches and spam; and a more effective single European emergency number 112. - More consumer choice as a result of more competition, especially by giving national telecoms regulators the new remedy of functional separation for telecom operators with significant market power. Better management of radio spectrum for unleashing the "digital dividend" (the radio spectrum freed as a result of the switchover from analogue to digital TV) and providing broadband access for all. Increased competition in the telecoms market led to a reduction of the list of relevant markets regulators have to analyse, simplifying the regulatory environment and reducing the regulatory burden.

Commission Decision 2005/513/EC on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLANs), 11.07.2005.

Commission Decision 2005/928/EC on the harmonisation of the 169,4-169,8125 MHz frequency band in the Community (frequency band originally designated for the ERMES paging system), 20.12.2005

Commission Decisions: 2006/771/EC on the harmonisation of the radio spectrum for use by short-range devices, 09.11.2006 [updated by Commission Decision 2008/XX/EC]; and 2006/804/EC on the harmonisation of the radio spectrum for radio frequency identification (RFID) devices operating in the ultra high frequency (UHF) band, 23.11.2006

Commission Decision 2007/98/EC on the harmonised use of radio spectrum in the 2 GHz frequency bands for the implementation of systems providing mobile satellite services, 14.02.2007

Commission Decision 2007/344/EC on harmonised availability of information regarding spectrum use within the Community, 16.05.2007

Commission Decision on the harmonisation of the frequency band 3400-3800 MHz for terrestrial systems capable of providing electronic communications services in the Community

Commission Decision on harmonised conditions and spectrum use for the operation of mobile communication services on aircraft in the Community and Commission Recommendation on the authorisation of mobile communication services on aircraft

Commission Directive 2002/77/EC of 16.09.2002 on competition in the markets for electronic communications networks and services.

Decision C(2007) 249 on reserving the national numbering range beginning with '116' for harmonised numbers for harmonised services of social value, 12.02.2007.

Council Directive 89/552/EEC of 3.10.1989 on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities, as amended by Directive 97/36/EC of the European Parliament and of the Council of 30.06.1997 ("Television Without Frontiers" Directive). Current EU rules are limited to traditional broadcasting. The Commission has proposed a modernisation of the EU rules on audiovisual content services (cf. its proposal of 13 December 2005).

Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop.

Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights.

Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

Council Directive 2001/115/EC of 20 December 2001 amending Directive 77/388/EEC with a view to simplifying, modernising and harmonising the conditions laid down for invoicing in respect of value added tax.

Council Directive 2002/38/EC of 7 May 2002 amending and amending temporarily Directive 77/388/EEC as regards the value added tax arrangements applicable to radio and television broadcasting services and certain electronically supplied services.

Commission Decision setting up the Member States' Expert Group on Digitisation and Digital Preservation (2007/320/EC), 22.03.2007.

Directive 2000/31/EC on E-commerce provides the legal basis for electronic commerce and aims to harmonise rules on issues such as the transparency and information requirements for online service providers, commercial communications, electronic contracts and limiting the liability of intermediary service providers.[56]

Of relevance to semiconductors is Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products.[57]

Directive 93/83/EEC, applicable to satellite broadcasting and cable retransmission is also worth mentioning.

Environment

Manufacturing products: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1154&format=HTML&aged=0&language=EN&guiLanguage=en

Waste:

Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).

Directive 2002/96/EC and the related Commission Decision: Member States are required to calculate and report on collection, recovery, re-use and recycling targets on waste from electrical and electronic equipment (WEEE). Figures would be recorded by product category.

Prevention and recycling policy – tackle the issue of life-cycle thinking as a basis for setting waste policy targets – planned Communication on a Thematic Strategy for the Prevention and Recycling of Waste

Amendment of the Waste Framework Directive (Directive 75/442/EC – which waste treatment operations can be classed as recovery, changing recovery/disposal definitions, classifying when waste becomes waste.

Chemical products used in ICT manufacturing: *http://ec.europa.eu/enterprise/reach/index_en.htm*

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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56 http://ec.europa.eu/internal_market/e-commerce/directive_en.htm.

57 http://eur-lex.europa.eu/Notice.do?checktexts=checkbox&val=129312:cs&pos=-1&page=-1&lang=en&pgs=10&nbl=1&list=129312:cs,&hwords=&action=GO&visu=.

Directive 2006/121/EC amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances

Energy efficiency:

ICTs have an important role to play in reducing the energy intensity and increasing the energy efficiency of the economy, for which the document COM (2008) 241 provides a good basis.[58]

Directive 2005/32/EC on the eco-design of Energy-using Products (EuP) establishing a framework for the setting of eco-design requirements for Energy-using Products, including criteria such as the product's entire life cycle and environmental impact.[59]

Commission Decision on e-Commission 2006-2010: enabling efficiency and transparency, COM (2005) 4473.

Regulation (EC) No 106/2008 of 15.1.2008 on a Community energy-efficiency labelling programme for office equipment[60] provides that the Community institutions, as well as central government authorities, within the meaning of Directive 2004/18/EC on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts, shall specify energy-efficiency requirements that are not less demanding than the Common Specifications for public supply contracts having a value equal to or greater than the thresholds laid down in Article 7 of that Directive.

External competitiveness

ICT sector overall

Global ICT trade expanded strongly up to 2007. The weakening of the economic environment and declining demand in key markets led to a slowing of growth in ICT trade in 2007 and the first half of 2008. Europe continues to be a net importer of ICT goods. In 2007, the largest exporters of ICT goods were China (€ 238 billion), EU15 (€ 120 billion) and the United States (€ 86 billion). After the United States (€ 185 billion), the largest importers of ICT goods in 2007 were the EU15 (€ 179 billion) and China (€ 173 billion). The EU15 and the United States have had a steadily growing ICT trade deficit from 2003 onwards. More recently, the trade deficit in the EU15 decreased slightly by 6% from €63 billion in 2006 to €59 billion in 2007. Over the same period the US trade deficit decreased by 12% from €84 billion in 2006 to €74 billion in 2007. The direction and composition of trade in ICT goods can be attributed in part to the fluctuation of exchange rates and, more importantly, to the changing patterns of global production, with rapid growth of ICT markets and production both in developing countries and, to a lesser extent, in the new EU Member States. In that respect the European and US trade deficits in the ICT sector are the result of a shift of manufacturing activity towards Asia and other developing countries.

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58 http://ec.europa.eu/information_society/activities/sustainable_growth/docs/com_2008_241_1_en.pdf.

59 http://ec.europa.eu/enterprise/eco_design/index_en.htm.

60 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008R0106:EN:NOT.
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:039:0001:0007:EN:PDF.

ICT goods account for a substantial share of total trade between the EU and its economic partners. ICT goods represent 10.2% of all extra-EU exports of goods and 14.4% of all imports.

A key challenge is ensuring a global regulatory environment and an enforcement regime compatible with the fostering of EU competitiveness. Ensuring the effective protection of IPR is an issue of particular concern. In addition, access to markets continues to be a priority issue for several sub-sectors, especially regarding the internationalisation of SMEs' activities (OECD Information Technology Outlook 2008, DG Enterprise and Industry Competitiveness Report 2006, UN COMTRADE Database, DG Eurostat COMEXT database).

ICT manufacturing

High-value added electronic components (semiconductors) are exported to Asia, where they are assembled in notebooks, PCs, communication products and then imported back as final products. Regarding semiconductors, for example, the consumption level in Europe is 16 % of the world market for semiconductors, whereas manufacturing is only 11 %, which results in a significant trade deficit (OECD Information Technology Outlook 2008).

Telecoms equipment and electronic components are the main sources of exports and computers the main source of imports. (DG Information Society i2010 mid term review 2008). The EU ICT manufacturing industry also lost world export market share between these years. The market share for all EU25 countries in world trade in ICT (extra-EU trade only) was 11% for ICT manufacturing in 2006 compared to 13% in 2004. China's share of world exports increased by two percentage points to 21% between 2004 and 2006, while Japanese market share decreased by almost 5% during the same period of time and amounted to 8% in 2006. US market shares remained stable during this period. Vertical specialisation in different stages of production has led to rapidly growing trade in intermediate inputs. In the office, accounting and computing machinery industry, imported inputs make up 70% of the final product. Large parts of the production process, parts and components have become standardised and, being labour-intensive, have moved to low-cost countries in Asia. Manufacturing of office, accounting and computing machinery has experienced the most relocation of production (to the new Member States as well as Asia), whereas manufacturing of telecommunications equipment and micro-processors has largely remained in the EU due to higher labour productivity. EU is more successful in trade in ICT services, posting a trade surplus which has been growing steadily since the mid 1990's.

Non-European regions have recognised the importance of the nanoelectronics industry and are trying to attract investments in their area. For example, Australia, Canada, China, India, Japan, Korea, Malaysia, Singapore, Taiwan, USA, and the State of New York use horizontal or sectoral incentives (tax, subsidies) to attract and retain investment in R&D and manufacturing activities in R&D and/or capital intensive sectors (semiconductors, software, pharmaceuticals, etc.). If this migration trend continues, the cooperation between European SMEs and nanoelectronics producers overseas is likely to become more difficult. Companies from these regions will have shorter time-to-market responses for new products and devices.

ICT services

Belgium, Ireland, Germany, the Netherlands, Sweden and UK are specialised in trade in communication services. Belgium, Ireland and UK are also relatively more successful in trade

in computer services. This specialisation is also based on the ability of EU to produce services of relatively high quality and value added, thus reinforcing the pattern that EU has comparative advantages in the production of knowledge intensive goods and services of high quality.

Employment and geographical dimension

ICT sector overall

The share of ICT employment in business sector employment in the EU14 rose slightly from 5.2% in 1995 to 5.6% in 2006, whereas the US experienced a small decrease in terms of share of employment from 5.8% to 5.5%. The decline in the US figures could be an indication of the impact of the growing manufacturing and services trade with developing countries. Moreover, the ICT sector is likely to become less employment-intensive as the share of value added increases. Finland, Sweden and Ireland had the largest shares of employment in total business employment, at over 8%, and these shares have increased markedly, as they also did in Hungary, the Czech Republic and Denmark. The United States has about 30% of ICT employment across the OECD area, the EU has 35%, Japan 14% and Korea 6%. (OECD Information Technology Outlook 2008)

Employment in computer and related activities is also one of the top two in terms of the highest growth in employment.

The most recent statistics for value added from OECD and the Groningen Growth and Development Centre (GGDC) for the ICT sector cover only 19 of the Member States. According to those data, two thirds of the value added in the ICT sector is produced in the four largest countries: France, Germany, Italy and UK.

ICT manufacturing

ICT manufacturing sector witnessed a decline in overall employment over the last decade. Germany has the largest share of ICT manufacturing production.

In Finland and Ireland, ICT manufacturing accounts for the major share of the total ICT sector.

ICT services

The European ICT sector is becoming more service and software orientated, from which a great part is embedded. The highest share of ICT services production is held by UK ICT services firms. Employment in the ICT software and service sector is steadily growing and now represents two thirds of the total ICT sector in Europe (Wintjes and Dunnewijk 2008).

Belgium, Netherlands, Spain and Sweden produce relatively more ICT *services* than is suggested by the size of the respective countries. The telecommunications services industry accounts for around two thirds of total ICT services value added in Belgium, Netherlands and Spain, while computer services are responsible for a larger proportion of value added in ICT services in Sweden. Some of the new Member States, such as Czech Republic and Poland, also have comparatively large ICT service industries. Telecommunications services are the largest industry in the Czech Republic in relative terms, while the computer services industry

plays a larger role in Poland (OECD Information Technology Outlook 2008, DG Enterprise EU Industrial Location and Structure – Statistical Indicators).

Telecoms went through a process of re-organisation and rising labour productivity, which resulted in declining employment. However, during the same period, new and higher qualified staff have been hired. This trend will continue. There are no major structural problems, and the fundamentals of the telecoms sector are robust.[61] Considerable pressure on EU ICT employment is expected, mainly due to increasing competition from outside the EU and global industrial restructuring.

Growth areas (within the sector)

ICT sector overall

Prospects for the ICT sector are much less favourable than in recent years. With the unfolding of the financial crisis, economic conditions have progressively worsened over the last year, and both business and consumer confidence has declined. This has led to the economic outlook and for the ICT sector being revised sharply downwards. ICT growth in the OECD area will, at best, be slow in 2008 and will decline in 2009. The situation has deteriorated significantly since the end of 2008 and the crisis is now having an important impact on the sector.

In recent years, ICT investments have closely tracked GDP growth. This is likely to continue in the future due to the relative importance of ICT investment. The development of ICT investments will reflect the worsening macroeconomic conditions that began in 2008.

This development is made worse by weak short-term indicators for the ICT sector recently. In the United States, ICT production and markets were under pressure from a looming recession. This is also true for the EU and Japan, although ICT markets there have performed better than in the US. In the first half of 2008, ICT trade continued to perform better than might be suggested by the aggregate performance and ICT indicators. (OECD Information Technology Outlook 2008).

The growth of the ICT sector for 2008 is constrained to a maximum of 4% over the OECD area, with very different performances across segments and markets. There is likely to be considerable pressure on the ICT market in 2009, owing to weakening economic conditions. The impact might well be more severe for employment in the ICT sector, due to increasing competition from developing countries and global industrial restructuring of the ICT market.

ICT manufacturing

EU growth rates in manufacturing between 1995 and 2006, compared to the last three years of that period (2004 -2006), showed that ICT continued to be among the highest performers, with high radio and TV equipment growing faster still (10% compared to 6%); other numbers were: office machinery ((2.9% compared to 3.7%) and scientific instruments ((3.7 compared to 3.9%). The same applies to labour productivity growth, with radio and TV equipment growing at about 8% per year between 1995 and 2006 (14% for the years 2004-2006) and

[61] See e.g. J.P. Morgan: Telecom Services, Europe Equity Research, 23 January 2009; Sal. Oppenheim: Telecommunications Guidance Outlook 2009, 21 January 2009.

office machinery and equipment growing at 6% per year during both periods. With the exception of scientific instruments, where employment increased by 1% between 2004 and 2006, employment in ICT manufacturing decreased by around 3% in the same period (OECD Information Technology Outlook 2008, DG Enterprise, EU Industrial Structure 2007 challenges and opportunities).

According to estimates made by the European Regulators Group and by McKinsey, investments of up to 300 billion Euros are needed to roll out a Europe-wide fibre access network. Further investments will be needed to roll-out modern mobile broadband networks (UMTS and Long Term Evolution (LTE)) as well. These investments are essential during the economic downturn to help immediately stabilize the economy, to ensure the competitiveness of the sector and the European economy and to achieve its broader industrial and social goals. Therefore the November 2008 EU recovery package recognises that investments in broadband are essential during the economic downturn and earmarks 1 billion euros to achieve broadband for all and stimulate upgrades to fibre. As of June 2008, there were just over 1.3 million FTTH/B subscribers in Europe, compared to 3 million in the US and more than 21 million in Asia (IDATE FTTX Watch Service 2008). These differences can partly be explained by different industrial policy approaches. Further political initiatives to boost investment in new fibre optic broadband networks can be expected from the US soon, as President Obama has already highlighted the decisive role of broadband networks in overcoming the current downturn.

Response to structural change

ICT sector overall

Globalisation has changed the landscape of ICT production. Increasing shares of both ICT manufacturing and services production are being seen in Asian countries. In 2007, the share of OECD countries declined from 85% in 2003 to 78% of the global ICT market, as ICT markets grew by 9.6% globally, but only by 7.3% in the OECD area. This is not only the result of new competing Asian firms, but also the result of the relocation of ICT production that had previously taken place in USA and EU. Global restructuring of ICT production continued in 2007 and 2008, with the new EU Member States and developing economies occupying a more important role both as producers and as new growth markets. The changing landscape reflects changing comparative advantages and technological developments partly enabled by ICT, which has facilitated a fragmentation of production processes, allowing a slicing of the value chain according to comparative advantages in different locations.

The weakening of global economic conditions after the economic crisis will have an impact on the globalisation of the ICT sector, in terms of the restructuring of production, investment and R&D activities. The declining ICT activity in industrialised countries could level off to some extent as a result of the demand for new ICT products and related investments in production, coupled with growth in emerging economies (OECD Measuring Globalisation 2005, OECD Information Technology Outlook 2008, DG Enterprise Competitiveness report 2006, EU Industrial Location and Structure).

ICT manufacturing

ICT manufacturing industries are maintaining the same shares of total manufacturing in 2003 as in 1993. The changes that have occurred during this period have been only small, and

electronic valves and tubes and scientific instruments have even increased their shares of total manufacturing value added.

Structure of sector

ICT sector overall

The ICT sector is heavily concentrated in most sub-sectors. Large firms with more than 250 employees account for more than 60% of the employment and produce more than 70% of the value added in the sector.

ICT manufacturing

Manufacture of telecommunications equipment is most concentrated in ICT *manufacturing* and 80% of value added is produced by the largest firms (of more than 250 employees), who employed 75% of all those working in the industry. The industries manufacturing office machinery, electronic valves and tubes and radio and TV receivers are also highly concentrated. The relatively high level of concentration can be explained by the existence of high sunk costs and economies of scale [e-Business W@tch (2006)]. The concentration is less pronounced in the industries producing scientific instruments [European Commission (2005A)].

ICT services

The services industry is considerably less concentrated than ICT manufacturing, although there are large variations between ICT services industries. Telecommunications is the most heavily concentrated *services* sub sector. Former state-owned telecoms operators still have a large role in the telecommunications industry, although they have been increasingly being challenged by new firms in the last few years. The developments in the sector have been driven by market liberalisation and deregulation in the 1990s, followed by the entry of a large number of new network operators. Also the increasing convergence of platforms and technologies has dismantled barriers between different markets and resulted in increased competition from firms that were previously active in other markets. One example is the transmission of voice over Internet (VoIP) which has been driven by increased broadband penetration and has led to change in the telecoms market. Computer services are considerably less concentrated than telecommunications services. Around 0.5% of the companies that employ more than 250 people produce around 45% of the value added and employ some 30% of the labour force in the industry. The highest share of value added (some 60%) is produced by SMEs. This industry hosts two thirds of all ICT firms, and 90% of the ICT sector's micro firms are found in this industry (DG Enterprise Competitiveness Report 2006, DG Enterprise, EU Industrial Location and Structure).

Vulnerability to financial crisis

ICT sector overall

According to forecasts by EITO from November 2008 (EITO Special Report: The financial crisis and ICT markets in Europe, New market forecasts 2008-2009), the market for telecommunications remains largely unaffected by the current crisis and is expected to grow by 0.4 % to € 346 billion in 2009. Compared to earlier EITO estimations, a decrease in growth can be observed, but this is not only related to the economic crisis.

A key challenge is ensuring a sound and balanced regulatory environment and an effective enforcement regime, by providing incentives to innovate and invest whilst also taking into account the impact of the economic crisis. In the current economic climate, new investment must be funded largely by cash-flows from existing activities. Cash-flows are already under pressure from price deflation caused by strong competition, regulatory price cuts and an overall weakening macroeconomic climate. Therefore, upcoming regulatory initiatives in the EU, which could distress the capital situation of the industry, need to be reconsidered against the background of the current economic crisis.

Within the ICT sector at least two groups of companies can be distinguished: The first group – typically the services segment of ICT – is endowed with adequate own financial reserves and manageable debt ratios, and needs long term incentives to invest, thereby boosting the economy. According to estimates, investments of up to 300 billion Euros are needed to roll out a Europe-wide fibre access network. These investments are essential during the economic downturn to help immediately stabilize the economy, and to ensure the competitiveness of the sector and of the European economy. Therefore, the EU recovery programme underlines the importance of broadband and supports it.

The second group - typically the manufacturing segment of ICT - is being put under significant pressure by the crisis and has to struggle with lower revenues and high losses. They do not have significant financial resources and are finding it difficult to get loans due to their high debt ratios. These companies are in danger of quitting the market unless they can improve their financial conditions to overcome the crisis and re-structure their business model.

ICT manufacturing

In order not to lose leadership in the mobile and fixed-line sector, investments in modern broadband infrastructure are essential in order to provide high quality networks and a variety of services. Established Internet businesses are still maintaining very high growth rates. These are typically firms that are mainly engaged in digital content distribution. The semiconductor industry is struggling with the global downturn, mainly due to overcapacity and falling prices, and decreasing investments. As the semiconductors industry is steadily moving towards Asia, Europe's market share has been declining since 2000, from 21% to 16%. The semiconductors industry experienced a massive drop in sales during the fourth quarter of 2008 that extended in the first quarter of 2009. The fall in the production capacity rate over the last six months wiped out all profits or led to massive losses, several companies filling for bankruptcy protection.

From the macroeconomic indicators combined with business and consumer sentiment, it can be concluded that ICT growth in EU countries will slow down in 2008 and decline in 2009. The ICT sector is also under pressure, but the real impact has not yet fully been absorbed. We expect that some segments, such as telecommunications, will not be influenced to the same extent as the IT equipment segment. The manufacturing segment and the semiconductor industry in particular are struggling with the global downturn and asking for financial support. This is mainly related to the slowdown in manufacturing, especially in the automotive industry, which affects the supporting electronic systems and semiconductor component industry.

The economic downturn will lead to different business models and could accelerate the restructuring and consolidation process worldwide and in Europe. The most visible change is expected in manufacturing. This may trigger a new wave of mergers and take-overs, which needs to be coordinated from a European industrial policy perspective. Consolidation and restructuring of these segments is seen as crucial in terms of regaining strength and improving competiveness.

17. INDUSTRY-RELATED SERVICES

Basic facts and figures on the sector

Due to the extreme diversity of the services sector, the analysis presented here refers only to six service sectors which are heavily used by industry. The six sectors concerned are: **Engineering and technical services**; **Computer and (non-standardised) software services; Logistics; Recruitment and temporary employment; Private security services; Industrial cleaning.** The data are estimates based on the most recent official statistics and information provided by the sectoral associations. These six sectors employ around 14.7 million persons in the EU27 and have total turnover of about €1,150 billion. Approximately 20% of the total output is directly used by manufacturing industry, with the bulk being absorbed by other industrial and non-industrial clients. As a rough estimate, procurement for services by manufacturing industry in Europe is worth approximately €230 billion. Statistical classifications make it difficult to obtain detailed disaggregated data on the development and performance of these important sectors. There is considerable heterogeneity across Member States, such that European aggregates may mask big differences between countries. With the exception of logistics, the other five sectors belong to the NACE 74 classification (Business Services). The Business Services sector (in total) accounts for 8.8% of EU employment and 7% of value added (2005). The high growth rate is due in part to growth in overall demand, and in part to outsourcing of service functions that previously were performed in-house by manufacturing and other companies. The development of the logistics sector[62] has also been driven by outsourcing, but also by the privatisation of many transport and distribution functions which previously belonged to the public sector.

Competitiveness assessment

Business services are economically important, not only because of their relative shares in employment and value added, but because they have important interlinkages with the rest of the economy, thus contributing to the adjustment capacity of the European economy as a whole[63]. However, the heavy reliance on reputation, rather than other means of objectively assessing the quality of the services provided, and the relative absence of quality standards, appear to limit the scope for price adjustment as price stickiness hampers the reallocation of resources across activities, and reduces the passing-on of cost reductions to customers. Industry and professional standards – including codes of practice – is an area where many of the business service sectors are active, but the development of EU wide industry norms and standards is, to a large extent, at a relatively rudimentary stage. The declining growth rate of labour productivity in Business Services in Europe and the large disparity vis-à-vis the US are possible indicators of market malfunctioning, although it should be borne in mind that the measurement of services productivity is fraught with many difficulties. Although business services generally perform badly in terms of their own productivity growth rates, they can help to raise the productivity of their clients.

R&D and innovation

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62 Harmonised and comparable statistics for the logistics sector will only become available after data is reported in line with the NACE Rev. 2 which became effective in 2009.

63 SEC(2007)1517 Implementing the new methodology for product market and sector monitoring. Results of a first sector screening.

Sectors such as engineering and technical services, computer-related services and the more skilled (typically ICT-related) segments of logistics services are heavily reliant upon knowledge and skills to drive innovation and, in turn, productivity developments. R&D and innovation aspects also arise in the technical development of equipment and systems associated with less knowledge-intensive sectors, such as security services and also industrial cleaning. An important element is the relationship between the providers of equipment, materials and systems and the service providers themselves. There appears to be scope for strengthening the linkages between equipment manufacturers, service providers and, ultimately, service clients, in order that both technological and organisational innovations can make a greater contribution to enhancing the efficiency and effectiveness of service provision. A key aspect is the growing complexity of services being requested by clients. This results in an expanding scope of knowledge and skills requirements, combined with the management and organisational capacity to handle complex projects. Non-technological forms of innovation, for example based on response to specific customer requirements, organisational innovation etc., are of key importance. At the same time, low margins, increased client pressure to reduce costs and the prevalence of SMEs – particularly in engineering and technical services – all mean that firms within these sectors face considerable constraints as regards investing in R&D and innovation. There is concern that the intellectual property mechanisms offer little help to business services providers in safeguarding returns on investment in R&D and innovation. This may result in under-investment and lower than optimal take-up of innovation by business services. In a broader context, there is a perception that innovations in business services are under-recognised and under-valued when compared to tangible product innovations and innovations in (manufacturing) processes. Detailed R&D figures for the six sectors referred to here are not available; however, overall business enterprise expenditure[64] on R&D (BERD) in the services sector in EU-27 amounted to 0.18 % of GDP in 2004 compared to 0.13 % in 1998, i.e. a growth of almost 40 % in less than ten years. However, it is still low compared to total EU-27 business R&D expenditure, which is 1.17 % of GDP. Hence, only 15 % of all EU-27 business R&D is performed in the services sector.

Knowledge and skills

Labour force and skills and the inter-linkage with underlying demographic change are an area where all sectors face significant challenges. However, these challenges are very diverse and vary from sector to sector. On the one hand, for low skilled, labour intensive service sectors, a shrinking active labour force can be seen to pose the problem of securing a sufficient volume of labour, particularly where the work itself may be associated with relatively unsocial or poor working conditions and is therefore viewed as relatively unattractive. To some extent, this is reflected, for example, in the prevalence of minority and (im)migrant labour in sectors such as industrial cleaning. Here, raising standards, training and skills is not only about efforts to increase the professionalism and quality of services provision, but is also seen as a means of increasing the attractiveness of the sector to potential workers. On the other hand, shortages of workers with a high level of specific skills are a major concern for the knowledge intensive sectors, such as computer related services and engineering and technical services. These sectors face external challenges from countries which have a growing stock of technically skilled workers (e.g. engineers, ICT professionals, etc.) and hence, for example, the potential for off-shoring of activities. In addition, tight conditions in local labour markets means

[64] European Commission: Towards a European Research Area: Key figures 2007

increased competition from other sectors that may be able to offer more attractive employment conditions. For the sector of private employment agencies, who can be seen as an intermediary in the process of matching labour supply and demand, the increasing difficulty that their clients face in recruiting skilled and specialised workers is reflected in the fact that this is the fastest growing segment of the employment agency business in Europe. In this respect, demographic change and the changing needs for and availability of skills represent significant opportunities for the sector. At the same time, existing national regulation and restrictions on the use of temporary agency work are important for the sector – and their clients – in shaping the national skills profiles of temporary agency workers.

Market structure: Competition

National sector-specific regulatory measures have a significant impact on the market structure in the different countries. A high degree of regulation mostly goes hand in hand with a high level of market concentration. For example, in the private security services (PSS) industry, the Belgian market is characterized by heavy regulation. Only a limited number of companies (170) are active in the sector and the top five companies dominate the market. In Germany, on the other hand, regulation is far less strict. Around 4,000 companies are active in the German PSS industry and the large global companies have a much lower market share. The same scenario can be seen in the private employment agencies industry (PrEA) where, in the heavily regulated French market, the top five companies account for over 80% of the market. In the much more liberalised UK market, the top five companies only account for about 20% of the market. Concentration levels appear lower overall in the market for professional services of architects and engineers, and once again there is a weak correlation between profitability and concentration[65]. Renowned companies command significant premia and only a small group can aim at the very top tier of the market. However, for these top firms there is strong international competition for major projects. There are high levels of regulation in Germany, Italy, Luxembourg and Austria. There are concerns about high concentration and high profits in Austria, Latvia and Luxembourg, which are all small countries. There is in fact very little cross-border trade in services[66]. In engineering consultancy, however, cross-border contracting is common, particularly for larger contracts. Above a certain level, it is generally necessary to establish a commercial presence in the country concerned. Market segmentation and fragmentation can also be observed in particularly knowledge-intensive industries, often on the basis of the development of specialised services targeted towards specific client groups. It may well be the case that, in these segments, the market is characterised by oligopolistic competition, or even near-monopoly situations.

Market structure: Regulation

In general, national regulatory measures have far more impact than do EU regulatory measures on conditions in service markets. This is evident in national policies and regulations that affect the costs and conditions of labour, such as income tax, social security systems, minimum wage legislation and rules on employment conditions, which are of particular importance for labour intensive business services. Next to these types of provisions, several business service sectors are strongly affected by sector-specific national regulations that may

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65 DG ENTR: Study on competition in the service sector: an initial screening for market monitoring purposes (November 2008)

66 Eurostat: Statistics in Focus, 26/2006: Demand for services

differ considerably across Member States. Examples are found in a Commission study[67] in relation to the private employment agencies industry (PrEA), private security services (PSS) and the engineering and technical service industry (ETS). In the PrEA industry, for example, some countries (e.g. France, Belgium, Spain) maintain restrictions on the use of temporary workers in the public service sectors, whereas no such restrictions exist in other countries (e.g. the UK). Also, in the PSS sector and the ETS sector, there are big differences in the level of regulation as to who may (or may not) engage in certain activities within the sectors. The Services Directive[68] will significantly improve conditions for the provision of cross-border services in the EU, but it should be noted that two of the sectors referred to here (PrEA and PSS) are not covered by the Directive.

Environment

Services supplied by the industrial cleaning sector are affected by regulations and standards relating to the (client's) premises to be cleaned (e.g. health, hygiene and safety, and environmental regulations) and in relation to use (and disposal) of cleaning products and equipment (e.g. hazardous products and waste disposal). Environmental protection projects (water treatment, pollution control), natural resource related projects (mining, oil extraction) and planning (urban, transport) are responsible for the strong growth in the demand for engineering and technical consulting services. As the logistics sector is in practice often integrated with the transport sector, environmental standards and regulations have an important impact. Increasing fuel duties, introducing urban congestion charging and imposing emission taxes are examples of policy measures that have a significant indirect impact on the logistics sector. For example, the location of distribution centres depends on factors such as the location of production, the location of consumers and the costs of transport. Policies can also lead to shifts between different modes of transportation.

External competitiveness

From the perspective of international and global competition, there are important big differences between the sectors in terms of potential competitive pressures. For some, the provision of services requires close geographical proximity to clients; therefore international (global) competition *per se* is of limited relevance, except where foreign firms establish themselves in local markets. For engineering and technical consulting, and logistics, global competition is an important factor in the development of the market. For example, the engineering consulting services sector is already seeing some activities being outsourced to lower cost regions such as India, where there is a plentiful supply of engineers, and global competitors are starting to become more present even in European markets. For logistics, Chinese companies are becoming increasingly important competitors in the sector and an additional challenge is posed by the growing attractiveness of Eastern Europe as a location for logistics activities, due to both lower costs and the growth of markets in the region.

Employment and geographical dimension

There is no single clear picture across all sectors. Many of the services require proximity to the client and there is relatively little direct cross-border service provision. Market entry

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67 Ecorys: Industrial policy and services (2008) http://ec.europa.eu/enterprise/enterprise_policy/industry/index_en.htm

68 Directive 2006/123/EC

mainly occurs through Foreign Direct Investment (FDI) and establishment of a commercial presence in the market concerned. Geographical distribution is only partially linked to the pattern of industrial distribution, since all six service sectors are also providers of services to non-industrial clients. The level of employment also reflects the extent to which these services have been outsourced, or are performed in-house – a factor which varies from industry to industry and from one Member State to another.

Areas of growth (within the sector)

See below: Structural change.

Response to structural change

Structural change is regarded as an important issue for all of the six sectors. To a large extent this reflects the role played by these sectors in the externalisation process (e.g. outsourcing and off-shoring etc.) and provides an important driver of growth for the sectors. In particular, private employment agencies have a specific role in helping business adapt to structural change and changing labour requirements. At the same time, structural change is also taking place within service sectors themselves. One aspect is the greater segmentation of services markets and providers, reflected in consolidation among major players and 'niche' strategies being pursued by smaller firms and new entrants. Also, expanding the scope of services provided and the development of multi-service and 'one-stop shop' approaches, for example the development of facilities management services, is a further feature of the structural change taking place in the business services sector.

Structure of sector

In some sectors the market appears to be moving towards greater segmentation. For example, the private security market is clearly evolving towards a dichotomic market with large consolidated (and international) players delivering services to large industrial clients, as well as public authorities and specialized institutions such as banks, whereas smaller local players are mainly focused on smaller clients, SMEs and the private (individual) market.

Vulnerability to financial crisis

The industry related services are likely to be hit by the downturn in the "real economy" and manufacturing as well. A reduction in demand for manufacturing goods has an immediate impact, since, unlike manufacturing companies, it is difficult to mothball capacities or to simply operate at a lower level of production until demand recovers. Instead, reduced demand is likely to lead rapidly to job-shedding and (potentially) market exits. In general, most industry related services are not very capital intensive and are not likely to suffer unduly from a credit squeeze. The logistics sector is an exception, since logistics service providers have invested heavily in their vehicle fleet of trucks and/or aircraft. They are also likely to suffer from any downturn in demand from their industrial clients as a result of a drop in output. This is likely to have immediate and drastic consequences for the smaller operators. Furthermore, it should be noted that the failure of a sizeable logistics service provider could cause serious disruption of industrial production, given that many companies depend on such providers not only for distribution of their products but also for just-in-time delivery of components. Operational services, such as industrial cleaning and private security services are likely to be relatively unaffected, since they provide inputs for which demand is fairly constant and predictable. In addition, contracts are generally concluded for a longer period, although tighter

conditions will force many of their clients to pare services down to the absolute minimum when contracts come up for renewal. On the other hand, these same conditions may also lead industrial and other clients to re-examine the case for outsourcing of these services, which would lead to increased demand. Private recruitment agencies will be hard hit, since in the event of a decrease in industrial output temporary workers will be the first to be shed. Engineering and technical consulting services would be hit by any general downturn in overall activity resulting from falling demand from industry, but expect an increase in demand resulting from the bringing forward of investment projects as a result of government intervention. This would stabilise demand in the short term. When the infrastructure projects reach a degree of maturity in one or two years, it is expected that industrial demand will pick up again. This is not the case, however, for architects, for whom the slump in the housing market in many countries is already having serious consequences. Computer related services are less likely to be affected in the short term than, say, hardware manufacturers, since a large percentage of their business is underpinned by long term software licence and service contracts. Development work could, however, be slowed down, and clients for computer related services may choose to postpone investment in new projects until economic conditions are more favourable. As a result of the downturn, many companies under financial pressure may resort to outsourcing activities that were previously conducted in-house. However, this would not result in short term gains, but rather lead to growth in the medium to long term.

18. LEATHER TANNING AND LEATHER GOODS[69]

Basic facts and figures on the sector

According to the latest structural data available, in 2006, the leather tanning sector[70] comprised some 3,700 enterprises and generated a turnover of €10.7 billion. These enterprises employed around 52,000 people in the EU27. The leather goods sector[71] comprised 14,000 enterprises in the EU27 and generated a turnover of €10 billion. These enterprises employed around 109,000 people. In recent years, the number of enterprises and jobs has generally decreased. Within the EU, the weight of employment in this sector is disproportionately higher in several new Member States in the sector's employment than their weight in terms of turnover or value added, which is a clear indication of their high labour intensity.

In 2008, production fell by 6% in the leather tanning sector and by 2.5% in the leather goods sector For the leather and related products sector, the fall in production has increased from the end of 2008 (-11% in the fourth quarter as compared to the same period in 2007) into 2009 (-18.5% in the first quarter of 2009).

Competitiveness assessment

Hides and skins account for 50-70 % of the production cost of finished leather, which means that the leather tanning sector is highly dependent on the availability and price of raw materials.[72] EU industry considers the quality of European raw materials to be the best for

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69 Data in this section is derived from Eurostat, and COTANCE (Confederation of National Associations of Tanners and Dressers of the European Community).

70 NACE 19.1

71 NACE 19.2

72 Figures from COTANCE (Confederation of National Associations of Tanners and Dressers of the European Community).

certain specific products. Since access to European raw materials has become more difficult (slaughter rate and beef production have dropped in recent years), access to raw materials outside Europe is crucial. However, this is often hampered by tariff and non-tariff barriers. The increasing purchasing power of Asian competitors on global raw material markets is affecting prices and the availability of raw materials, to the detriment of EU tanners and many developing countries. The sector faces problems linked to significant copying and counterfeiting (of designs & models, brands & trade marks). The predominance of small and medium-sized enterprises means that enterprises often have insufficient information on their rights and the means of protecting intellectual property, or lack the financial resources to defend their rights. To remain competitive in the global market place, European leather producers must exploit their raw materials more efficiently and avoid wasting collagenous material (hides and skins) that constitutes valuable raw material for other industries and agriculture. Wasting raw materials creates waste, which has serious adverse environmental and cost implications. By-products should be either reused/recycled or converted into new, higher value products. EU tanners and leather goods producers are gearing their production towards higher quality output and products of high fashion content. However, lower production cost countries are constantly improving their quality and expanding their product range. In short, EU leather producers are faced with similar challenges to those of other industrial sectors where the major factors of competitiveness are research and innovation, skills and quality, design and value-added, knowledge and know-how, together with better access to third country markets.

The leather tanning industry utilises hides and skins, i.e. by-products from the meat and dairy industry, which would otherwise have to be disposed of by other means, such as in landfills and incinerators. Leather is the basic output from the tanning sector. It is an intermediate industrial product, with applications in downstream sectors of the consumer goods industry. The footwear, garment, furniture, automotive and leather goods industries are by far the most important outlets for the products of the EU tannery sector. The processing of hides and skins also generates other by-products, which find outlets in several industry sectors such as pet and animal food production, fine chemicals including photography and cosmetics, and soil conditioning and fertilisers.

R&D and innovation

The main technological challenge for the leather industry is to create higher value-added products, processes, materials and organisations that are eco-efficient and sustainable. Efforts also focus on environmental protection through waste reduction, recycling, recuperation and substitution of chemicals etc. Non-technological innovation, such as design and creativity, plays an important role in companies' innovation strategies. In addition to the quality of hides and skins, the quality of the finished leather depends on the chemicals used for the tanning and finishing process. Innovation in the chemical industry is therefore often related to the use of new substances with improved characteristics. The leather tanning sector is an important downstream user of a wide range of chemical preparations and as such is affected by REACH (see under "Environment").

Knowledge and skills

Market in emerging economies is growing, which means that new export skills and competences are needed, posing a challenge for a sector that consists mainly of SMEs. A significant effort is also required in order to improve competitiveness in terms of business

models, new materials, enhanced manufacturing processes, etc. In addition, there is an increasing demand for environmental experts in order to mainstream environmental considerations into business strategies. Due to the verticalisation of activities, there is a need for competences in supply chain management and, in an increasingly global business environment, there is a need for intellectual property expertise as well. Companies would also benefit from in-service and vocational training programmes that encompass all levels of employees and management.

Market structure: Competition

The sector is composed of small and medium-sized enterprises, and is highly diversified in terms of products and fragmented in terms of companies (since 1990, only two mergers have been subject to Commission scrutiny). The sector falls under horizontal State aid rules and does not have any sector specific State aid legislation.

Market structure: Regulation

There are no sector specific directives for the leather sector, but several horizontal directives have impact on the industry, covering the environment, social and employment issues, and the internal market. In addition, some Member States have regulations on the labelling of leather goods.

Environment

Environmental regulation has a big impact on the sector. Industry estimates that environmental protection costs amount to 5% of all operational costs.[73] The main environmental directive directly affecting the leather tanning industry is Council Directive 2008/1/EC concerning integrated pollution prevention and control (the IPPC Directive) which covers plants for the tanning of hides and skins where the treatment capacity exceeds 12 tonnes of finished products per day. The European IPPC Bureau organises this exchange of information and produces reference documents (BREFs), which Member States are required to take into account when determining best available techniques, either generally or in specific cases. The BREF for the tanning of hides and skins, adopted in 2003, is currently being revised. Under the river basin management plans (Water Framework Directive 2000/60/EC) the sector is obliged to take measures to reduce water pollution, if the discharge from a plant contributes towards the pollution of a body of water, thus preventing compliance with the "good status" criteria. The leather tanning sector is also affected by REACH, as it is a big downstream user of a wide variety of chemical preparations. Given the similarities in technology, firm size, competitive pressure, and the heavy use of chemicals, it could face similar risks to those of the textile industry in terms of the vulnerability of low volume chemicals that are of critical importance to leather production and products, such as potentially significant reformulation costs, withdrawal from the market and time-to-market problems. However, REACH could also bring benefits for business by increasing innovation in leather chemicals.

External competitiveness

[73] Data from COTANCE (Confederation of National Associations of Tanners and Dressers of the European Community).

The EU is the world's largest supplier of leather, but re-export of leather made out of semi-finished products from other origins is growing. The main export markets of EU tanners are emerging economies that have developed a large manufacturing capacity for the production of leather articles, namely Hong Kong, China and Turkey, while most imported semi-processed leather (wet-blue) comes from Brazil and the USA. Finished leather imports come mainly from India, Pakistan, Argentina and Brazil. The main EU export markets for leather goods are Japan, Switzerland and the USA, while most imported leather goods originate from China and India. The EU trade balance for leather goods is negative due to increasing imports. Exports, however, remain at the same level as in the past due to high quality and design. For the leather tanning sector the balance is close to positive due to improvements in export performance. The two main concerns of industry are access to raw materials and market access. Since access to European raw materials has become more difficult (slaughter rate and beef production have dropped in recent years), access to raw materials outside Europe is crucial. However, many third countries maintain export bans and restrictions on raw *hides and skins*. Improvements in market access are expected first and foremost in the context of the WTO, where the European Commission supports the overall withdrawal of all export taxes by various WTO members (China, Argentina, Brazil, Indonesia, Pakistan, India, etc.). As to market access for finished leather and leather goods, in third countries the EU leather industry is often faced with considerable trade barriers (high import duties and tariff and non-tariff measures such as excessive labelling or certification requirements), whereas the EU markets are open, virtually without restriction, to imports from all over the world.

Employment and geographical dimension

There have been significant numbers of job losses and company closures over the past few decades. This has been due to intense competition from low-cost third country producers, restructuring and modernisation, and technological progress. The sector is concentrated in the south of the EU, and thus the socio-economic life of certain regions is heavily dependent on the leather industry. Italy, which employs almost 30,000 people in this sector, is by far the most important leather producer. Italy is also the main producer of leather goods, accounting for 34 % of employment. The new Member States, for their part, are face major restructuring challenges and adjustment processes that can cause difficult situations at local and regional level.

Areas of growth (within the sector)

Flexibility, adaptability, design, quality and rapid response are the main assets of the EU leather industry. These features are strengthened by the fact that retailers and brands are paying more and more attention to issues such as traceability of products and better environmental care.

Response to structural change

There has been a significant amount of restructuring in the EU leather industry over the years. Companies try to concentrate their activities on improving market positions and becoming global, and family-businesses are letting new shareholders in. However, many companies, particularly in the new Member States, often lack the necessary financial resources. Regional concentration sometimes compensates for the lack of structural consolidation, and in Italy such cooperation is an integral part of companies' strategies. The ongoing restructuring has major social implications in terms of the number of jobs lost and the re-skilling of workers.

Addressing this issue involves taking into account the regional implications of job losses and the fact that workers' skills are often not based on degrees or diplomas, which is a major cause of low re-employability. In addition, due to the sector's image, it has become increasingly difficult to find workers with adequate qualifications. Access to finance is also a problem, both because the sector consists mainly of SMEs and because of its image.

Structure of sector

Companies in the sector are typically family-owned small and medium-sized enterprises (even the biggest tanners usually have fewer than 250 employees).

Vulnerability to financial crisis

The principal effects of the financial crisis on the EU leather industry are likely to be: reduced access to financing (especially for SMEs, which dominate the sector), lower domestic demand and weaker international trade growth. More difficult access to financing, together with plummeting business confidence, is likely to lead to postponement of investments, including those in research and innovation, which are crucial for the global competitiveness of the sector. Eventually, a fall in consumer confidence and spending will have a negative impact on the leather goods sector, in particular as regards luxury goods. As regards leather tanning, production and orders remained stable until May 2008, when they dropped and stayed at a lower level ever since. In the last quarter of 2008, production was 16 % and orders were almost 30 % lower than in the same period in 2007. In the leather goods sector, production in the last quarter of 2008 was 8 % down on the last quarter of 2007, whereas new orders fell by 18 % between 2007 and 2008.

For the leather and related products sector, the fall in production has accelerated from the end of 2008 (-11% in the fourth quarter as compared to the same period in 2007) into 2009 (-18.5% in the first quarter of 2009).

Developments in the leather tanning sector are closely linked to developments in its outlets, such as the automotive industry and the footwear industry. Recovery in the leather sector will also depend on developments in export markets. In 2008, exports of the leather tanning sector were €2.846 billion and imports €2.714 billion, which meant that the trade balance was slightly positive as imports fell by more than exports (16.9 % and 7.9 % respectively), while the trade balance for the leather goods sector stayed clearly negative (exports €5.392 billion and imports €8.405 billion).

19. LIME[74]

Basic facts and figures on the sector

In EU 27, production in 2006 was estimated at 28 million tonnes, or roughly 12% of the 227 million tonnes produced worldwide. Value added amounted to 3.3Billion €. The lime production process is highly energy-intensive, with energy costs generally representing up to half of total production costs, although - with recent surges in energy prices - this situation has probably changed. Employment in sector accounts for some 14.000 people. Lime kilns represent a very high, long-term investment which makes it difficult to respond to short term fluctuations in demand or to comply with new legislation affecting energy or emissions. Production of lime fell at the end of the 1980s as a result of changes in patterns of consumption, specifically due to the biggest consumer, the steel industry, drastically reducing its specific consumption of lime. Production started to grow again in the mid 1990s with increasing environmental applications, such as water, sludge, soil, acid gas, and disinfection treatment. Apart from the two applications mentioned above, lime is also used in construction and clay soil stabilisation, chemicals, paper, food and feed, healthcare, etc.

Competitiveness assessment

The EU lime industry's *strengths* are:

- the EU's biggest lime producers are operating on an international stage;
- this position gives industry access to global best practice and technology;
- because lime is, in general, a product which is not normally traded over long distances (> 300km) under normal circumstances because of transport cost[75], the industry is close to its markets. This means it can offer good customer service, low transport emissions, and is often able to react quickly to changing customer requirements;
- lime products have many different applications and in many cases lime is an essential and strategic material in the process chain of other products;
- raw materials are extracted mainly on-site, which avoids unnecessary transportation and the costs and environmental damage which that could cause;
- in some of its applications, lime plays a very positive role in terms of the environment, such as in water, sludge, soil, acid gas and disinfection treatments;
- it has a well trained and experienced workforce;
- it sustains a high level of employment in local areas;

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74 NACE 26.52

75 Transport cost is the main reason why lime is not traded over long distances, and transport cost is directly related to transport emissions. This suggests that the industry has very high transport emissions compared to the added value of the product.

- the industry's interests are well represented especially at European level;
- it makes great efforts to promote itself well enough to ensure that the significance of its contribution to society is appreciated.

The EU lime industry's *weaknesses* are:

- it is a big consumer of energy, with energy costs accounting for up to half of total production costs;
- it is capital intensive;
- lime kilns are long-lasting (about 40 years), which means that it can be difficult for producers to comply in the short term with legislation affecting energy or emissions, for example, depending on the stage in the life cycle of the kiln;
- the cost of compliance with environmental legislation can represent a significant proportion of production costs;
- the industry has reached a level of performance which in many cases cannot be improved upon with current technologies, so that further major improvements at the production stage would require access to breakthrough technologies;
- as in many other industries, the lime sector potentially suffers from an image problem. Whilst enormous improvements in environmental performance have been achieved over the years, certain environmental bodies in particular continue to regard it as a major polluter which produces lime with little regard for the effects on the environment. The lime industry addresses this by means of a continuous dialogue with all stakeholders and by participating in several initiatives aimed at better informing the public, such as the European Minerals Day and Countdown 2010;

Opportunities for the lime industry include:

- using the environmentally friendly applications of lime to further improve the industry's overall image;
- continuing research for more environmental applications and speciality products.

Threats to the lime industry include:

- continuing increases in energy prices will further threaten the industry's competitiveness;
- the imposition of a unilateral and tighter carbon constraint on European lime producers as of 2013 could to lead to increased imports of lime from countries on the periphery of the EU, and possibly even from further afield;
- the rising cost of complying with environmental legislation;
- the EU lime industry is in competition, especially around the periphery of the EU, with other producers in other countries which do not conform to European quality standards,

and do not necessarily meet European standards on emery use, environmental control, or working conditions;

- the lime industry is a relatively small user of biomass, so the sector will have only limited bargaining power to ensure its share of scarce biomass in the medium and long tem;

- legal access to the lime industry's unique raw material, namely calcium carbonate, despite $CaCO_3$ being one of the most abundant minerals.

R&D and innovation

As in many industries, research in the lime industry is a highly competitive issue that is therefore left to individual companies, which may thus obtain a competitive edge. R & D in the lime industry is leading to the introduction of new products, including some with a positive environmental impact.

Knowledge and skills

Technology in the lime sector is at a mature stage and no further revolutionary technical developments are likely in the short term. Further developments are likely to occur in the field of the environmental field (emissions abatement and possibly the substitution of fossil fuels by wastes). Some lime manufacturers have been experimenting with the use of wastes over the years, but it is unlikely that these will ever be used to the same extent as in the cement industry. Current use of wastes is limited for reasons of supply and product quality.

Market structure: Competition

The European lime industry is quite concentrated, with 65% of production in the hands of eight companies, the rest being produced by a large number of small companies. Consolidation is not high, and only the largest producers operate on a global basis. Most companies are vertically integrated upstream, as they quarry their own raw material and process it up to the finished product. The number of companies does not fluctuate greatly, but has gone down in recent years due to some acquisitions and mergers. There is thought to be no over-capacity in most EU Member States. The principal barriers to entry are capital intensity and regulation. Laying down a lime plant is thought to cost the equivalent of about three years' turnover. None of the mergers has had to be referred to the EU competition authorities. There have been no cases of State aid or concentration.

Market structure: Regulation

There is no legislation existing at European level which applies directly specifically to the lime industry. Other European legislation affecting the industry is of a horizontal nature, covering environment, social and employment issues, and internal market (there are European standards covering a number of lime products).

Environment

The principal items of European environmental legislation affecting the lime industry are:

- Directive 79/409/EEC on the conservation of wild birds

- Directive 82/278/EEC on sewage sludge
- Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
- Directive 2008/1/EC concerning integrated pollution prevention and control
- Directive 2003/87/EC establishing a scheme for greenhouse gas emissions trading within the Community
- Directive 2006/21/EC on the management of waste from the extractive industries (mining waste Directive)
- Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency

Because the lime sector is highly energy intensive, and because CO_2 emissions result from the mineralogical transformation process used in lime production, as well as from the use of energy, the industry has every incentive to reduce its energy consumption, and environmental concerns are of paramount importance. Although it is committed to reducing CO_2 emissions, the industry's main concerns are the emissions trading scheme, and the direct and indirect impact of this scheme, through electricity prices, on its costs. Besides CO_2 emissions, the lime industry's emissions can be NO_X, SO_2, CO, and dust, and primary measures have been taken to improve product quality. The quantity of wastes that can be used to substitute fossil fuels and raw materials is limited for quality and supply reasons. As to wastes produced during the lime production process, they are mainly in the form of unburnt or overburnt products. In modern kilns, very little product out of specification is produced, but when this occurs it usually consists of dust collected from the exhaust gases. Small quantities of partly calcined material can be produced when the kiln is started up from cold. These are recycled back to the kiln wherever possible, or otherwise sent to landfill in exceptional circumstances. Following the adoption of the emissions trading scheme with the aim of reducing CO_2 emissions at least cost across Europe, the EU lime industry fears being put at a severe disadvantage compared to third country competition. For this reason, an evaluation of the risks of carbon leakage is being carried out. The possibility of industry world-wide achieving an agreement in the area of CO_2 emissions might provide a level playing field to avoid the risks of carbon leakage. Soil is an important issue for the lime industry, since it has to be removed as a primary step in the quarrying of limestone, but is usually saved for use in quarry restitution. Access to raw materials and the complex permitting for planning and extraction are also important issues for the industry. The reference document on the best available techniques in the cement and lime manufacturing industries (BREF) was adopted in December 2001 under the provisions of the IPPC Directive, and its revision was completed in April 2009. It has to be taken into account when the permit conditions based on best available techniques are taken into account. It is currently being revised.

External competitiveness

Lime is a heavy product with a relatively low selling price, so transport costs dictate the distance over which it can normally be transported on a regular basis under viable conditions. Therefore, delivering lime over long distances is scarce except for certain speciality products, or to areas of the world with no natural source of limestone. Only a very small percentage of total production is exported, and this is usually to neighbouring countries. Where the biggest

producer has identified potential markets, it has usually taken the decision to invest in production capacity in those markets.

Employment and geographical dimension

Lime is produced in all Member States except Cyprus, Luxembourg, the Netherlands, and Malta. By far the biggest production is in Germany, followed by France, then Belgium.

Areas of growth (within the sector)

Some highly performing products in the environmental field (treatment of flue gas, water, waste, and waste water, etc) and some niche markets, such as the production of precipitated calcium carbonate, are expected to grow. Geographically, growth is situated in those countries with a booming and developing economy, where construction and civil engineering projects are flourishing.

Response to structural change

There has been a certain amount of restructuring, involving some mergers and takeovers, in response to structural change. The steel industry reducing its specific consumption of lime by 40% has prompted the lime industry to seek to increase its output of products going into environmental applications, such as soil stabilisation or water treatment, and into other speciality products.

Structure of sector

Of the eight major producers in the EU, five operate on a global basis. Whilst the others have more than one plant, they all operate within the European Union. The rest of the producers are small and medium sized enterprises with just one or two production facilities.

Sector-related services

As in many other industries, the European lime industry outsources some services to external firms, for example in the fields of maintenance, laboratories, etc, but there is no overall pattern. In turn, the lime industry provides a service to its consumers via the environmental benefits that some of its applications bring.

Vulnerability to financial crisis

The principal effects of the financial crisis on the EU lime industry are associated with higher costs of capital, reduced access to credit, and lower demand for lime, as reduced activity in the principal consuming sectors like the steel industry, construction, paper, chemicals, foodstuffs, healthcare, etc, begin to feed through. The construction industry has already started to see reduced activity in some Member States. Whilst environmental applications may be less strongly affected, reduced industrial activity will have a negative impact on applications such as flue gas cleaning.

The lime industry is a major consumer of energy, and is therefore highly vulnerable to the cost of energy and the volatility of energy prices.

Lime is a commodity product with relatively high transport costs and so is not commonly transported over long distances (>300km). However, as producers in non-EU countries see their domestic demand falling, it is likely that competitive pressure in the EU will increase, as producers try to export their surplus production to the EU or invest in new facilities to export to the EU. In addition, the reduction in dry bulk sea freight costs which have fallen dramatically (down almost 90% from their peak in May/June 2008), has made it more attractive to import from abroad, and in fact increased imports are being seen.

Producers are mothballing production facilities in some cases. One of the biggest producers, in Belgium, has stopped production on half of its kilns, and has stopped quarrying at its biggest site. Instead, it is shipping in limestone from a neighbouring quarry in the same group down the river Meuse. The prospects for an immediate recovery are not good.

20. MECHANICAL ENGINEERING[76]

Basic facts and figures on the sector

In 2007 mechanical engineering enterprises produced € 498,448 million worth of machines and other mechanical equipment, directly employing 3.25 million people.

The EU27 mechanical engineering sector has grown slowly but steadily from 1990 to 2007, and represents 9.78% of the value of the EU27 industrial production. Its weight in the total manufacturing industry increased between 2006 and 2007 (from 9.4 to 9.78). Its size makes the EU the largest producer of mechanical engineering equipment in the world, clearly surpassing the US and Japan.

Exports have increased by 43% in the last three years. Although imports have also increased, the trade balance is highly positive (at around €115 billion in 2007). Total exports of machinery represent 42% of total mechanical engineering production.

Internal consumption of machinery rose by 14% in 2007, from €337 billion to €383 billion.

Mechanical engineering tends to be a cyclical industry, whose performance depends on the investment cycles of its clients, many of whom are in the manufacturing and process industries.

Competitiveness assessment

Labour productivity in the EU is much lower than in Japan, and the sector's long-term productivity growth is lower than in the US, thus further widening the already existing gap. In constant terms, the value added per employee (in 2006) was € 115,200 in the US, € 95,700 in Japan and € 59,500 in EU25. This productivity gap, while also reflecting less capital-intensive production processes and the dominance of SMEs in Europe as compared to the US and Japan may in the longer run affect the sector's future competitiveness, as it is also coupled with the relatively high labour costs, increasing competition from emerging industrial countries and the currently unfavourable Euro exchange rate.

In addition to insufficient SME financing, which is considered a problem for the industry, the sector is very sensitive to the overall levels of investment, primarily in the European economy and, more generally, in the world economy. However, strong demand from several Asian countries and other emerging markets has been observed over recent years, before the crisis hit this sector.

R&D and innovation

R&D expenditure in EU Mechanical Engineering has remained stable over the last ten years, amounting to about 2% of the sector's turnover. This is relatively low, and is considered by some observers to be less than what the sector needs in order to stay ahead of its international competitors. The need for research incentives is therefore apparent. In high-tech equipment,

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the main challengers are the US and Japan, and more recently China, in medium and especially in low-tech equipment.

Community-wide R&D initiatives can provide opportunities for the sector's companies to benefit from EU-funded research activities. Efforts should be made to allow more SMEs (90% of the sector's firms) to benefit from EU-funded programmes.

Although mechanical engineering is a relatively mature technology with a relatively slow rate of structural change, continuous investment in new technologies is the key to remaining competitive.

Knowledge and skills

Manufacture of mechanical equipment is a knowledge-based business. The EU Mechanical Engineering sector is particularly strong in offering know-how intensive, customer oriented solutions of high quality and reliability, including the supply of specialised equipment and turn-key plants.

There appears to be a mismatch between the qualifications offered to students by the educational institutions in Europe and the skills needed by the industry. Both sides should, therefore, have an incentive to cooperate more closely in order to address this problem, which could have serious consequences in the future.

Respect for intellectual property rights by competitors is essential in a knowledge based industry like Mechanical Engineering.

Market Structure: Competition

The sector is very heterogeneous, with some multinational companies and a high proportion of SMEs. In the period from 1990 to 2007, 163 mergers have been approved by the Commission. Nine of these were approved subject to remedies and two were prohibited. There have also been two cases where the Commission found restrictive agreements by companies and imposed fines.

Market Structure: Regulation

This sector is regulated by some major pieces of Community legislation, such as the Machinery Directive, which has in fact de-regulated the market by introducing the New Approach principles of the manufacturer's self-declaration of conformity and reference to the use of voluntary standards.

The Pressure Equipment Directive harmonises the European market for equipment entailing hazards resulting from internal pressure, for example boilers in power stations, certain chemical installations or consumer products such as pressure cookers or portable fire extinguishers. It applies to a large group of products, the yearly production of which is estimated to have a value of about €90bn, and allows for the introduction of innovative technical solutions without the need to change legislation.

Another important Directive affecting this part of the sector is the Lifts Directive, the aim of which is to ensure free access to the internal market for lift installers and equipment, while guaranteeing the safety of the users and maintenance staff.

The Personal Protective Equipment Directive, which contributes to the prevention of occupational accidents and illnesses, and the ATEX Directive (equipment to be used in potentially explosive atmospheres), are also part of the body of Community legislation affecting the sector. These "New Approach" Directives have proved successful in terms of improved safety and liberalisation of EU trade.

While recognising the need for and benefits of harmonisation, the industry believes that the cumulative effect of legislation originating from various policy areas and levels poses problems, particularly for SMEs.

Environment

The sector is affected by horizontal environmental legislation such as the Waste Directive, the Packaging Directive, REACH, etc. Moreover, the sector will be affected by the Directive on establishing a framework for setting eco-design requirements for energy-using products (EuP). In addition, Directive 2000/14/EC lays down environmental noise requirements for fifty-seven types of machinery used outdoors. The noise levels are in part already so low, that the product needs a complete structural redesign in order to comply with the Directive. The extra costs (including in terms of extra energy consumption) can only be justified within the EU, where the Directive is binding. On external markets, however, where levels are lax, the over-engineered products for the EU market are simply too expensive to compete with structurally simpler products.

Lastly, Directive 97/68/EEC and its amendments 2002/88/EC and 2004/26/EC on the harmonization of measures against emissions of gaseous and particulate matter pollutants from internal combustion engines on Non Road Mobile Machinery set emission limit values to reduce the amount of pollution in the air for the benefit of the environment.

External competitiveness

EU Mechanical Engineering is a highly export-oriented industry – equipment exports worth €210 billion in 2007 represented 42% of the total value of its production.

In high-tech equipment, the EU has to compete internationally, first and foremost with the US and Japan. These three account for about three quarters of world production of machinery and mechanical equipment. The US and Japan are the EU's major challengers in terms of production volume and technological standards. Moreover, China is considered as a serious competitor in medium- and especially in low-tech equipment.

Speedy, affordable and less bureaucratic granting of EU-wide patents would be a significant competitive asset for this sector.

Another important asset is that the EU is the world's largest market for mechanical equipment. Its weaknesses include a relatively low level of investment in capital goods, a lack of skills, limited access to finance for SMEs, high labour costs, the increasing productivity gap with the US and growing competition from emerging industrial countries in the field of standard equipment.

There is also a clear need to improve the market surveillance systems in the EU. For non-consumer goods, in particular, the delay between an infringement being noticed (e.g. in respect of unsafe, non-CE compliant machinery) and the goods being removed from the

market is too long. Counterfeiting, especially from China, is estimated at 5% of the sector's turnover, posing a serious problem.

Employment and geographical dimension

From 1995 to 2001, the sector grew considerably in terms of both employees and the number of enterprises. Given the increasing complexity of the equipment produced, engineers now make up a larger share of the sector's overall employment: Between 2001 and 2005, however, the sector recorded a slight reduction in both the number of employees and the number of enterprises.

In 2006, both the number of employees and the number of enterprises increased (around 2.6 million employees and 23,500 enterprises). Therefore, the earlier reduction does not indicate that the sector had been facing an acute crisis, but rather that productivity is increasing. There appears to be no need for significant restructuring.

The EU is the largest producer of mechanical equipment in the world and is successfully present on all significant export markets, except Japan.

Structure of the sector

The sector is very heterogeneous. There are many hidden champions, some of whom are world leaders in, for example, market share. There are also still a few multinationals, even though subsidiaries and subcontracting are common in the sector. Many of the companies are niche players, known only to sector specialists. Also, many of the companies are family owned and have a long tradition of being a key regional economic factor and employers, often producing close to steel producers – a relic from historical times.

Nevertheless, geographical closeness provides the necessary feedback loops between upstream and downstream users, which is beneficial to both. Hire and fire employment policies are rare, as companies which have had to lay off key skilled personnel will subsequently not be able to make up that loss of skills and inherent know-how. Staff turnover tends to be very low in this sector, as loyalty from both employers and employees is high.

Areas of growth (within the sector)

All sub-sectors again performed satisfactorily in 2007 following a positive progression in previous years.

Response to structural change

Mechanical Engineering plays a key role in the economy as a supplier of goods for other sectors, thereby determining the potential of these sectors to increase their productivity. The sector may be less affected in the short-term by the financial crisis than other sectors which have faster production cycles.

Payment delays, particularly when the customer base is very small, may create bottlenecks in working capital, which can put even product champions out of business. Preproduction financing and difficulties in obtaining letters of credit have also become a serious issue, particularly when exporting outside of the EU.

Sector-related services

One market in the sector that is growing strongly is after sales maintenance. For some companies as much as 25% of revenue comes from maintenance, providing important long-term, stable, non-cyclical revenue. For example, new installations of elevators are often sold at a loss, as the revenue is made up by maintenance. Because of this structural change in business models, factors that prevent original manufacturers from taking the opportunity to link their sales to a maintenance contract may increasingly have an adverse economic impact on the financial performance of businesses, and will thereby hamper their capacity to innovate. Because machinery is more "intelligent", i.e. uses more software, updating as a form of maintenance is also a way to increase revenue and retain customers.

Machinery producers are increasingly becoming process designers, where the product is only a part of the production. This is not to be confused with turn-key production, but should be seen rather as sub-parts of a production process.

Vulnerability to financial crisis

There are signs of incipient problems of small numbers of new orders and this may become a challenge in the near future, depending on the subsector. There has been a considerable fall in the number of enquiries from potential customers (depending on the sub-sector).

For example, the European construction equipment industry sector is facing difficulties; purchases in 2008 dropped by 45% compared to 2007 due to reductions in building activity and, connected to this, in the sales of construction equipment. The building industry will continue to suffer in most European countries in 2009 and 2010. This will also have major impacts on the lifts industry. It is expected that orders for lifts and escalators in 2009 will decrease by 20% in Central Europe, 30% in Northern Europe and 50% in markets such as Spain or Ireland compared to 2008. In the Central European Member States orders for lifts and escalators have almost completely dried up since the beginning of 2009.

Furthermore, the Industry technology subsector is looking at declining growth as, by comparison with the above-mentioned sub-sectors, its product is closer to the end-customers.

It is assumed that the short-cyclic part of this business is already feeling the crisis directly, whereas the long-cyclic business still seems to be stable. The healthcare technology subsector (including hospitals, etc.) is still stable, as investments in this sector are mostly funded by public money.

The mechanical engineering industry mainly consists of SMEs, and their liquidity is usually supported by short-term credits because of their limited own equity, in particular letter of credits and working capital. Credit availability for SMEs has decreased and is becoming more expensive, as banks increasingly amortize their previous losses. The result is a further increase in the interest rate.

21. MEDICAL DEVICES[77]

Basic facts and figures on the sector

Covering a wide range of products, from simple bandages to the most sophisticated life-supporting products, the medical devices sector[78] plays a crucial role in the diagnosis, prevention, monitoring, and treatment of diseases and the improvement of the quality of life of people suffering from disabilities.

Medical devices are a key component and provide a key input into health systems. In 2007, 8.9 percent of GDP was spent on healthcare in Europe, and spending on medical technology makes up 6.8% of total healthcare spending (i.e. 0.55% of GDP). By comparison, in the US, 15.3% of GDP is spent on healthcare, and 5.5% of healthcare spending (i.e. 0.84% of GDP) is on medical technology. The average spending per head on healthcare is €2,073 and, of this, €128 is spent on medical technology. In the US, an average of €4,906 per head is spent on healthcare, of which €271 is spent on medical technology.

Medical devices are also an important part of the European manufacturing sector. Despite growing pressures from national cost-containment policies, that have curbed the positive trend of growth of the sector, the industry is extremely vital, driven by growing income, ageing populations and, in general, society's commitment to improving the quality of life. The medical device industry contributes at least 1.1 percent of total EU-25 manufacturing value added and 1.3 percent of total EU-25 manufacturing employment (around 530,000 people). In 2007 the European medical technology industry had sales of €72.6 billion. This total includes all 27 European Union Member States, as well as Norway and Switzerland. The annual growth rate of the industry is between 5% and 6%. The global medical technology market was worth about €216 billion in 2007, of which one third is the European market and 45% is the United States market (€98 billion).

Competitiveness assessment

The medical devices industry is largely sheltered from economic fluctuations, because numerous medical device products are used in essential healthcare. Demand in the medical device market actually depends on three major factors: life expectancy and aging of the population, consumers' need for products (determined by the severity and "curability" of illnesses and increased recognition of care needs (e.g. skincare)), and the ability / willingness of healthcare systems to pay for products. Another factor is currently posing a major challenge to the medical device industry, as it affects the full range of their products: that factor is the domination of the healthcare market by third-party reimbursement from governmental agencies (e.g. the NHS in the UK, the Joint Federal Committee in Germany), private insurance companies and managed care providers, resulting in a situation where demand is increasingly being controlled by a few bodies. There are big differences in

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[77] Data in this section is derived from http://www.eucomed.be/sitecore/shell/Controls/Rich%20Text%20Editor/~/media/pdf/tl/2007/portal/publications/compsurvey.ashx, and 'Identification of industrial sectors with weak competition, analysis of causes and impacts' - Final Report to EC DG Enterprise and Industry, Prepared by London Economics in association with ZEW and RPA, August 2007.

[78] NACE 33.1

reimbursement systems between countries. In recent years, policies in the US and the Europe have tried to limit increases in healthcare spending, and this has led to demands on service providers to limit costs, improve efficiency and improve patient outcomes. Further pricing pressure has been due to recent consolidation in the healthcare industry, resulting in more concentrated pricing decisions (from group purchasing organisations and integrated health delivery networks).

R&D and innovation

The research and development spending of the European medical technology industry amounts to between five percent and eight percent of total sales. This translates into annual R&D spending of €5.8 billion across Europe. By comparison, in the US the average is estimated at between 12 and 13 percent of sales.

Knowledge and skills

The provision of health insurance – public and private – has been key to innovation in medical technology and devices. The expansion of healthcare insurance in all national systems has nourished innovation in medical technology; and vice versa new technologies and new medical capabilities have expanded the demand for insurance, i.e. insurance that includes more people and embraces more health procedures and products. Theoretical and empirical analysis shows that the dissemination of a number of existing technologies has been highly responsive to insurance-related incentives.

Market structure: Competition

Increasing Growing competition in the provision of health services is leading to increased demands for quality. To meet these demands, companies are looking to streamline their production and distribution structures, including moving production activities to low-cost economies. Maintaining a strong product pipeline is at the heart of medical device activities, thereby ensuring that research and development remains a key part of industry strategy.

Market structure: Regulation

The sector is regulated by three main Directives:

- Council Directive 90/385/EEC of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices;
- Council Directive 93/42/EEC of 14 June 1993 concerning medical devices; and
- Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on in vitro diagnostic medical devices.

These three legal texts form the core legal framework. They have been supplemented over time by six amending or implementing Directives. The latest revision of Directive 93/42/EEC concerning medical devices aims at improving the safety and quality of medical devices, in order to obtain a higher level of health protection. In addition, these harmonised rules are intended to improve the functioning of the internal market.

Environment

The existing legislation set out in Directive 2002/96/EC on waste from electrical and electronic equipment (WEEE) applies. The Communication on a Thematic Strategy for the Prevention and Recycling of Waste was adopted in 2005 and an amendment of the Waste Framework Directive (Directive 75/442/EEC) is about to be published in the OJ. The Directive on energy using products applies. This provides a framework for the setting of ecodesign requirements for energy-using products, based on criteria such as the product's entire life cycle and environmental impact. In addition, the RoHS – i.e. Directive 2002/95/EC of the European Parliament and the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) – is currently under review. For the time being, medical devices are excluded from this Directive. However, their possible inclusion is under consideration.

External competitiveness

Data from 2005 on trade in medical devices shows that the position of the US is more competitive than that of European countries, and particularly that of Japan. However, the US trade balance has decreased in recent years, while the position of European countries has not changed substantially over time. Moreover, the analysis at the sub-market level reveals a highly heterogeneous situation across sub-sectors and shows the "vocation" of the EU as a producer (and net exporter) of electro-diagnostic equipment – a segment where the EU maintains a leading position. According to data from 2005, the largest exporting countries are Germany (€14 billion), Ireland (€6.6 billion), France (€6.1 billion), and the UK (€5.6 billion). The largest importing countries are Germany (€9.2 billion), France (€6.7 billion), Italy (€5.7 billion) and the UK (€4.5 billion). There are a number of cooperation instruments at international level, such as GHTF – the Global Harmonisation Task Force (Australia, Canada, EU, Japan, US) – and Bilateral Regulatory Cooperation with the main trading partners (US, Japan, China, India, Korea). Continued efforts in these areas are critical to ensuring market access for European manufacturers. The purpose of the GHTF is to encourage convergence in regulatory practices, in order to ensure the safety, efficacy, performance and quality of medical devices and to promote technological innovation and facilitate international trade. The main way in which this is accomplished is via the publication and dissemination of harmonised guidance documents on basic regulatory practices. Future challenges will consist in increasing the market share of the European medical devices industry, in particular by comparison with the US based industry.

Employment and geographical dimension

Approximately 529,000 people were employed in the European medical technology industry in 2007. This number is 25% up on 2003, and the fact that it is growing is a further indication of the importance of the medical technology industry in the wider European economy. Germany accounts for one fifth of total employment (110,000), followed by the UK, France, Italy, Ireland, and Spain. The new Member States (ten in 2004 and two in 2007) represent 10% of the total. Growth is particularly pronounced in Spain, where the share of the total has roughly doubled since 2003.

Areas of growth (within the sector)

With mature markets in the US and Europe the industry is looking to emerging markets for growth opportunities. These markets offer a number of opportunities due to their high economic growth, increased medical spending, aging population and the introduction of

reimbursement by several governments. However, given the very large number of emerging markets, prioritisation of key markets is crucial.

Response to structural change

Movement in and out of the medical devices sector is relatively small, and entry and exit rates are low.

Structure of sector

The medical device industry is highly heterogeneous and characterised by sub-markets at different stages in the product life cycle, and requiring different amounts of resources. There are about 11,000 medical technology companies in Europe. More than 80% of these are SMEs. The UK has the largest share (20%), followed by Germany, Spain, France and Sweden.

Vulnerability to financial crisis

SMEs make up around 80% of the MedTech industry. Their access to finance (bank credit, venture capital) has become considerably more difficult. Less money is spent on R&D and this delays the development of innovative devices. The situation is made worse by late payments in the public health sector and pressure to reduce expenditure on public health. There are reports of job cuts in the MedTech trade journal (see Clinica 1329 of 12 December 2008). A survey of US hospitals documents delays in investment and lower patient numbers.

22. NON-ENERGY EXTRACTIVE INDUSTRY[79]

Basic facts and figures on the sector[1]

In 2006 the non-energy extractive industry of the EU27 (hereafter referred to as NEEI or the 'extractive industry') generated a turnover of about €45 billion and provided employment to about 295,000 people. The extractive industry is a vital supplier of raw materials to major downstream industries, such as roadbuilding and the construction, chemicals, automotive, aerospace, machinery and equipment sectors, which provide a total value added of €1.324 billion and employ about 30 million people. The three main NEEI subsectors are metallic minerals, industrial minerals and aggregates. Downstream users of non-energy raw materials have been confronted with a doubling or tripling of the prices of many metallic minerals between 2002 and 2007.

Since mid 2008 the prices of many metallic minerals have displayed a significant downward trend towards levels common in 2003-2005. However, this drop seems to be relatively smaller for specific rare or high tech metals, or for industrial minerals and construction aggregates.

Obviously, higher prices in the NEEI sector offer opportunities to invest, innovate and continue to explore for new resources, in particular in some of the more remote regions of the EU, based on an increasingly advanced provision of pre-competitive data by national/regional geological surveys.

The EU's non-energy extractive industry is striving to remain competitive by supplying high quality materials. Increasing automation, particularly in deep mines, has resulted in a reduced work-force and higher productivity. The number of workers continues to decline, particularly in the new Member States, as they bring their sites and practices into line with modern standards. The industry needs to continue to advance technologically in order to remain competitive in Europe's highly regulated environment, and to keep producing products with sufficient added value for end users.

The Commission Communication "Raw Materials Initiative - meeting our critical needs for growth and jobs in Europe"[80] adopted on 4 November 2008 highlighted that raw materials are essential for the sustainable functioning of modern societies and that access to and affordability of mineral raw materials are crucial for the sound functioning of the EU's economy. Industrialised countries like Japan and the US have recognised their critical dependence on particular raw materials and are pursuing specific policies to safeguard their raw material supply. The Raw Materials Initiative provides an initial response to this issue at EU level and proposes an integrated raw materials strategy, consisting of 10 actions, and based on three pillars:

(1) ensuring **access to raw materials** from international markets under the same conditions as other industrial competitors;

(2) setting the right **framework conditions** within the EU in order to foster sustainable supply of raw materials from European sources;

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79 NACE 13 and 14

80 COM(2008) 699 and the associatiated SEC(2008) 2741 (annex 1: Eurostat data).

(3) boosting overall resource efficiency and promoting recycling to **reduce the EU's consumption of primary raw materials** and lower its relative dependence on imports.

This Communication, as well as the Commission Staff Working Documents SEC(2007) 771 and SEC(2008) 2741, illustrate that, domestically, access to land is a key requirement for the extractive industry, as it is obliged to operate only in locations where raw materials occur under economically viable conditions. The land area available for extraction in the EU is constantly decreasing due to other types of land use. As it is not unusual for at least a decade to elapse between the discovery of deposits in the EU and actual production, there is a clear need to further streamline the administrative conditions and speed up the permitting process for exploration and extraction activities. At the level of the EU, in particular the Natura 2000 legislation is often perceived by the extractive industry as an important barrier to development. As indicated in the Commission's Raw Materials Initiative, both Commission and Member States have undertaken to develop guidelines with the aim of providing clarity to industry and authorities on how extractive activities could take place in or near Natura 2000 areas, while safeguarding environmental protection. The guidelines are to be finalised in 2009 and will be accompanied by an exchange of best practices, where appropriate.

Competitiveness assessment

The *strengths* of the EU NEEI are:

- the majority of the metal mining and industrial mineral producers operate on a global level, which gives them access to global best practices and technologies;
- the aggregate and industrial minerals sectors produce bulk materials which are not normally traded on land over long distances under normal circumstances due to high transportation costs (this does not apply to distances by sea or waterway);
- raw materials are extracted on-site, which avoids not only unnecessary transportation, but also the costs and environmental damage which that might cause;
- in general, the industry remains in close contact with its markets, and is able to offer good customer service and react swiftly to changes in demand;
- production technologies are the best possible in terms of environmental performance;
- the current workforce is well trained and highly experienced;
- the NEEI sector provides a high level of employment in local (and sometimes remote) areas thanks to a wide network of indirect jobs and activities related to the main production process;
- the NEEI interests are well represented at national and European level;
- the NEEI sector has become much more conscious of its image in recent years and has been making considerable efforts to improve it;
- the sector makes great efforts to promote itself well enough to ensure that the significance of its contribution to society is appreciated.

Its *weaknesses* are:

- by definition, the extractive industry can only operate where the geological resources are present in sufficient quantity and quality, and at depths that can be worked economically with the available technology;

- the extractive industry can only operate on the basis of very long-term investments. As such there is an acute need for legislative stability, and a reduction of lead times for permit procedures, for both exploration and exploitation;

- the sector is rather vulnerable to economic sentiments: recent relatively high metal prices provided a clear incentive for renewed exploration, emphasising known locations ("brownfield exploration") over new exploration ("greenfield exploration"), but the current financial crisis is rapidly putting an abrupt stop to exploration;

- some sectors have a relatively high energy consumption. This is the case for metal mining, calcium carbide, graphite, magnesia and lime, with energy costs accounting for over one third of total production costs;

- the extractive industry is very capital intensive, and the costs of laying down a new production facility can often be well over €100 million;

- whilst enormous improvements in environmental performance have been achieved over the years, the extractive industry has traditionally suffered from an image problem, with certain environmental bodies still regarding it as a major polluter and not as a vital sector for downstream industries and growth and jobs in the EU at large;

- the metals and industrial minerals sectors are in competition with other countries which do not conform to European quality standards or meet European standards on energy use, environmental control or working conditions.

Opportunities for the extractive industries include:

- a growing need for "tailor made" raw materials by downstream industries, due to the development of new high tech products with a very positive environmental impact (e.g. fuel cells in hybrid cars, LED/OLED for energy efficient lightning, advanced aircraft alloys, as well as energy, resource and CO_2 efficient buildings and products);

- adaptation to climate change by downstream industries.

Possible *threats* to the industry are:

- competition from imports sourced from economies outside the EU with lower environmental and/or health and safety standards. This competition may become even more fierce for some sectors under the EU Emission Trading Scheme (EU ETS). The unilateral imposition of a tight carbon constraint may reduce the industry's competitiveness and lead to carbon leakage;

- high energy costs, especially electricity costs, as an indirect effect of climate change legislation (higher than in competing companies),

- as transport may have a considerable influence on the price of a metal or mineral, the recent significant decrease in freight rates is encouraging competition from low-cost and low EHS standard production sites;

- access to land, and the ability to plan ahead, in order to remain competitive;

- the very high cost of compliance with environmental legislation;

- an aging work force, and a lack of available skilled personnel;

- a rather persistent negative public image.

R&D and innovation

R&D and innovation are very important for the competitiveness of the NEEI. Developments in exploration techniques are helping to find new and, in the case of metal mining, deeper-lying resources, both onshore and offshore. Improvements in metal extraction and processing, coupled with higher prices, mean that lower quality resources can be extracted economically, while creating less waste. Automation makes the working environment in mines safer, while improvements in site closure and rehabilitation techniques enable excavation sites to be returned to other beneficial uses once extraction ceases, thus improving the sustainability and public image of the industry. In May 2008 the Commission recognised the European Technology Platform on Sustainable Mineral Resources (ETP SMR). The ETP SMR will focus on new exploration technologies as well as innovative extraction technologies to maximise resource utilisation and energy optimisation and to work in the area of closure and reclamation of sites. It will also focus on research in areas where the aim is to support and strengthen ties with global raw material producers.

Knowledge and skills

The industry is becoming increasingly innovative in an effort to remain competitive in an increasingly global market. Developments in exploration techniques are allowing new resources to be discovered at lower cost, while increased automation in mines is pushing up productivity. The industry continues to make progress in environmental performance through the transfer of knowledge and the use of best available techniques. The implementation of environmental legislation, such as the Environmental Impact Assessment Directive, also requires the industry to be more knowledge based. Further improvement is both necessary and achievable, although the scope for such improvements will vary depending on the sub-sectors involved. The introduction and dissemination of improved technology throughout the EU will continue to be a key factor in improving performance. The extractive industry, both globally and in the EU, is faced with a growing problem of skills shortage. The short-term impact on employment due to the economic crisis alone will not resolve this issue in the longer term. The number of graduates in subjects that are relevant to the sector is falling, while at the same time the average age of the workforce is increasing, with a significant percentage of professionals likely to retire over the next 5-10 years. More effective partnerships between universities, geological surveys and industry are needed in order to tackle the growing problem of skills shortage, such as the European Mineral Courses, and the Erasmus Mundus Minerals and Environmental Programme.

Market structure: Competition

The largest sub-sector of the industry within the EU produces materials for the construction industry. Because these materials have a high mass and a low value, transport costs are the dominant factor in the price. The sub-sector operates in all Member States and any international trade is limited. There is therefore strong competition at company level, but little at international level. However, industrial and metallic minerals are traded widely both between Member States and globally. The uneven geographical distribution of different types of minerals means that some Member States have rich mineral resources and active extractive industries, while others do not. There is therefore strong competition from non-EU countries, as well as at company and Member State level. Because of the wide diversity of minerals extracted in Europe, there is very little consolidation within the industry overall, with few exceptions. There are some major international companies, but these tend to specialise in particular mineral types. In the metal mining sub-sector, a process of major worldwide consolidation has taken place amongst the leading companies over the past decade. There are many small companies, particularly in the construction materials sector (aggregates). There is some vertical integration. For example, most companies which produce cement, bricks or products such as plasterboard operate their own quarries to produce the raw materials. Their capacity utilisation is not known, as in many cases the maximum rate of extraction is limited by permit conditions rather than by how quickly the companies can produce the materials. In general, the number of firms in the industry is stable. Barriers to entry are significant and involve high initial capital investment and a high degree of specialisation. It can also take a number of years - in some cases more than a decade - to obtain a permit to operate a new site.

Market structure: Regulation

The industry is strictly regulated by both EU and national legislation. The majority of EU legislation, which has an impact on the industry, is horizontal in nature, e.g. the Birds and Habitats Directives ("Natura 2000") and Environmental Impact Assessment, although two Directives (92/91/EEC and 92/104/EEC) deal with Health and Safety; and a Directive on the management of waste from the extractive industry has recently been adopted (2006/21/EC). No impact analysis has been done as of yet on the cumulative effects of the legislation. One of the actions proposed in the Commission Raw Materials Initiative will focus on improving the regulatory framework related to access to land by promoting the exchange of best practices in the area of land use planning and administrative conditions for exploration and extraction; any subsequent recommendations will be sent to the Council in 2010. Many of the controls on the industry are through national legislation, and in particular in relation to access to new resources. This is usually controlled through land use planning, which is falls within the competence of individual Member States. The biggest concern of the industry is access to new deposits, since obtaining permits is becoming increasingly difficult and expensive. Because of the long life of many sites, it is often necessary to implement regulatory changes at mineral sites which are already in operation. This can even be more difficult and expensive, compared with new operations. Screening of legislation is important in order to ensure that it is proportionate to the potential environmental impacts that the industry can cause. A voluntary multi-sectoral agreement between employees, employers and the Commission on 'Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products containing it was signed on 25 April 2006. This is the first use of such an agreement as an alternative to legislation.

Environment

The Communication[81] on promoting sustainable development in the non-energy extractive industry identified two types of potential concerns around extractive operations: Firstly, the extensive use of non-renewable resources may mean that these resources will not be available for extraction in the future. Secondly, the potential environmental impact of a particular operation, which depends on the management of the operation, is a cause of concern. The risks associated with the extractive operation (e.g. water pollution, changes in groundwater flow patterns, loss of biodiversity, air pollution, dust and noise) can vary depending on several factors. Therefore, management practices in the industry vary considerably from site to site. Mineral type, location and chemicals used are important factors. Managing these impacts effectively requires that activities must be in line with all relevant legislation that covers these areas. The Directive[82] on the management of waste from the extractive industries, implemented by Member States on 1 May 2008, puts in place measures, procedures and guidance to prevent or reduce any adverse effects on the environment, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries. It lays down the principles for waste operations and provides specific (permit) requirements for the safe management of waste management facilities. The industry has made very large strides in recent years to improve its environmental performance, which is reflected in the wide variety of good examples throughout the EU whereby, following closure, the extractive site is restored to uses that are beneficial for local areas. In some cases the area gained a higher environmental, economic and/or social added value compared with the situation before extraction began. Broad-based community support is essential for mining and quarrying operations, as it is part of their "social licence to operate".

External competitiveness

The EU is a net importer of minerals, with a rapidly increasing trade deficit (€20.6 billion in 2007). Most of this relates to metallic minerals, for which the trade deficit was €19.1 billion (2007), having more than doubled within four years (2003: €7.9 billion), partly also due to sky-rocketing commodity prices. The origin of imports differs for each mineral, as global resources are essentially unevenly distributed. In terms of value, the main sources (over €1 billion) of metallic minerals were Brazil, Chile, Australia, Peru, Canada, South Africa and the US. For industrial minerals (including precious stones), imports from South Africa, Israel, Canada and South Africa had the highest value. Imports of construction minerals were less significant compared with domestic production, although some specialist minerals such as ornamental stone are being imported in relatively significant quantities from countries such as India, Brazil, South Africa and, increasingly, China. External competitiveness is affected by a range of factors including increasing production and the availability of raw materials from low-cost developing countries and increased exploitation by EU neighbours of their domestic resources rather than imports from the EU. It has also been necessary to use trade defence instruments in recent years, mostly regarding value added products such as zinc oxide, magnesia and graphite electrodes.

Employment and geographical dimension

The number of people registered as employed in the NEEI in 2007 was about 295,000 (about 0.5% of total industry employment) of which the vast majority was working in the

81 COM (2000) 265 final, Brussels 3.5.2000.
82 Directive 2006/21/EC, Brussels 15.3.2006.

construction minerals sub-sector. The number of persons employed has generally been falling in recent years. The sector is dominated by companies with fewer than 10 employees, although in the metallic minerals sub-sector the average number of employees per enterprise is much higher (about 100). The geographical distribution of the sector varies depending on geological availability. An important characteristic of the extractive industry, which distinguishes it from other industrial sectors, is that it can only operate in places where suitable minerals are located, which is a result of past geological processes. This means that some minerals are extracted widely in all Member States, while others are only present in a limited number of areas. Some mineral types which are important for manufacturing industries are geologically not present in the EU, resulting in a complete dependency on imports or the use of recycled materials. Construction minerals are being extracted in most Member States, including the continental shelf.[83] The EU is among the world's largest producers of some minerals, including feldspar, kaolin and potash. The metals mining sub-sector is located in many of the EU-27 countries, and in particular in some of the more northern and more southern countries, such as Sweden, Finland, Greece, Spain and Portugal. There is also substantial metal mining in Poland, Slovakia, Bulgaria and Romania. New mines continue to be developed, and provide employment and economic growth in regions which have difficulties attracting other forms of investment. A European social dialogue was set up in the sector in 2002. The social dialogue makes a practical contribution to the competitiveness of the sector, enabling the social partners across Europe to address the common challenges facing their sector in a consensual and innovative way. The challenges being addressed by them are: the economic and social management of restructuring; improving the quality of industrial relations through corporate social responsibility, as well as initiatives to improve workplace health and safety. As indicated above, a multi-sector social dialogue agreement on the handling and use of crystalline silica was adopted on 25 April 2006 as an alternative to legislation.

Areas of growth (within the sector)

Globalisation is both opening up new markets and increasing the level of competition from developing countries. In particular, competition is strong from large-scale, high-grade overseas operations capable of producing metalliferous ores under low-cost conditions. The EU extractive industry tries to compete by supplying high quality materials, diversifying its products and markets and continuous cost-cutting. Furthermore, future mines will require cutting edge technology to extract resources from increasingly remote and deep locations on land, as well as from the seabed and ocean floor, in line with strict environmental regulations.

Response to structural change

This sector, and in particular the metals mining part, has a long history of adapting to structural changes due to the shifting balance between supply and demand. However, both the commodity boom due to growth of emerging economies in 2002-2003 as well as the slump in demand due to the current financial and economic crises took many companies by surprise.

Structure of the sector

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[83] Most Member States exploit at least one type of industrial mineral, but the pattern is variable. Germany, for example, is a major producer of kaolin, bentonite and potash. France is an important producer of gypsum, talc and industrial silica while within the UK, the extraction of kaolin and potash is significant.

Globally, the metal and industrial minerals sector is dominated by transnational companies. Within Europe, the majority of the companies are SMEs, but there is a tendency for to both horizontal and vertical integration.

Sector-related services

The major sector related services are mining (equipment) engineering and environmental consultancy, and the (multi-modal) transport sector, in particular related to bulky (construction) minerals.

Vulnerability to the financial crisis

- As the use of industrial minerals is very much spread over several downstream markets, this subsector seems somewhat less sensitive to the "ups and downs" of specific economical sectors, compared to metallic minerals. This may be reflected by the fact that prices for a series of industrial minerals have increased only moderately (several percentages) in recent years. However, the sales of some industrial minerals (such as graphite, calcium carbide, magnesia) are closely linked to specific “hard-hit” downstream markets, such as the steel and the aluminum industries.

- The extraction of construction raw materials typically follows infrastructure demand and, apart from already planned major infrastructural works and new housing projects in regions with a relative shortage, is likely to slow down, and in response to the crisis, companies are ending temporary employment contracts.

- For industrial minerals, and for metals producers in particular, the smaller enterprises as well as the so-called “junior mining companies” (largely responsible for worldwide exploration activities) have not only been suffering as a result of recent high energy prices, but are now also being hit in particular by the restricted availability of (high risk) capital. Several transnational “mining majors” are responding with lay-offs, temporary mine closures and the stalling/deferral of new mining projects.

- The costs for long-term financing are expected to increase due to the need to mine in more remote, deeper located or politically unstable areas, which are likely to increase the overall costs of new mining projects. This may well lead to a relative scarcity of such resources in the future.

- More stringent emissions regulations will bring additional costs, unless provisions to prevent carbon leakage are put in place effectively and in time.

- The Commission Communication on the Raw Materials Initiative is expected to provide positive signals in terms of encouraging continued exploration and showing the political will to continue improving the legislative framework (better regulation).

- The sharp fall in freight costs may have a significant effect in prompting more competition from outside Europe. Low cost products, which are often produced at much lower social and environmental standards than in Europe, may increase their market share.

- A depression in consumer markets due to the current crisis will cause a knock-on effect, which will be felt further up the supply chain in the medium and longer term.

As stated above, the current financial and economic crisis will have the effect of delaying exploration in general and the extension and development of new technologies in particular, as mining investments have dropped dramatically. As an illustration, the prices of shares in mining companies fell by between 40 and 75 % in early 2009.

23. NON-FERROUS METALS[84]

Basic facts and figures on the sector[85]

The non-ferrous metals sector accounts for 1.37% of EU manufacturing value added (i.e. €23.4bn) and 1.0% of employment (334,700 people). Turnover of the sector was €139.04bn (2.0%). Employment remained stable between 2003 and 2006, whereas productivity increased.

Non-ferrous metals are the first port of call for a considerable number of applications in manufacturing, such as mechanical engineering, transport, aerospace, construction, packaging, electricity and energy, consumer electronics, medical devices, the steel industry, etc. Therefore, demand for these metals has increased steadily with the growth in manufacturing. This situation has changed since mid-2008 due to the global economic crisis.

The EU is the biggest consumer of non-ferrous metals worldwide and has a large non-ferrous metals refining capacity for processing ores and concentrates, as well as for melting recycled metals (scrap). In the whole area of manufacturing of basic precious and non-ferrous metals in the EU 27, aluminium represented the largest activity, with €9.1 billions of value added in 2006, ahead of copper and zinc. The production volume of the non-ferrous metal industries has been growing slightly during the past 10 years (1998-2007) but, overall, the EU is losing its share on the world market, and its dependence on imported raw material for metal production and metals is growing rapidly.

The prices of most non-ferrous metals' are determined by the London Metal Exchange (LME) and therefore they do not necessarily correlate with the output volumes of an individual plant. Contracts between non-ferrous metals manufacturers and their customers always quote the LME price, regardless of the size of the contract.

Competitiveness assessment

By reducing costs and moving to higher segments of the market, the EU non-ferrous metals industries have remained competitive worldwide. The sector is characterised by high capital intensity and thus low flexibility due to high establishment and closure costs, high energy intensity (as much as 37% in the case of primary aluminium) and medium/low labour intensity. The most influential factors in the (long-term) investment decisions of metal producers are access to raw materials and energy at competitive prices, plus proximity to end-users.

Strengths

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84 NACE 27.42, 27.43, 27.44, 27.45, 27.53 and 27.54

85 Data source: own calculations based on Eurostat data; World Metal Statistics (World Bureau of Metal Statistics http://www.world-bureau.com/site.html,) London Metal Exchange (LME http://www.lme.co.uk/), CRU Monitor (www.www.crumonitor.com); European Aluminium Association (http://www.eaa.net/) Eurometaux (http://www.eurometaux.org/), European Copper Institute (http://www.eurocopper.org/), International Zinc Association Europe (http://www.iza-europe.com/)

- The non-ferrous metals industry is a key component of the EU's sustainable production strategy by ensuring the recycling of metal and by contributing to finding technological solutions in energy savings (transports, aeronautics and construction);

- The European non-ferrous metals industry has developed most of the industrial processes in the metallurgical area through leading technologies and skilled labour;

- The industry has established firm business relations with the main downstream users and can provide them with guaranteed high standards in terms of product quality and delivery conditions;

- The proximity and size of downstream industries remains the biggest incentive to keep certain activities in the EU.

Weaknesses

- Mature technologies – there is no expectation of a breakthrough technology to reduce energy consumption and CO_2 emissions in the next 2-3 decades;

- The production cost structure is heavily dependent on prices of imported raw materials and energy;

- Low flexibility due to the high costs needed to establish a new plant and high closure costs;

- Relatively low level of R&D investment, insufficient participation in publicly-financed R&D programmes.

Opportunities

- Increasing demand for non-ferrous metals in the EU, especially for high quality products

- Liberalisation of EU energy markets

- Changes in industry structure (vertical and horizontal integration)

- New product and process development, innovative applications

- Substitution of other materials by aluminium, copper and other non-ferrous metals in new applications (e.g. lighter means of transport) may help meet the EU climate change and renewable energy objectives by reducing CO_2 emissions, fostering renewable energies and improving energy efficiency.

Threats

- In some newly emerging countries, lower energy prices, and lower social and environmental costs are causing a shift of production to these countries;

- Trade restrictions, protection practices and/or State aid in some third countries;

- Rising costs of electricity in the EU, but cheaper electricity contracts available in Russia, the Middle East, South Africa and Iceland;

- Unfair international competition jeopardising access to scrap at competitive prices;
- Increasing dependency on third countries for imported materials;
- Cyclical nature of the price of commodities which is determined on the basis of global demand and supply.

R&D and innovation

R&D and innovation can play an important role at product level and in the production process. The sector remains a world leader in metal refining technology, processing and recycling. Total R&D expenditure has remained fairly stable in recent years, and non-ferrous metals belong to the group of industries where research and development input accounts for less than 5% of value added. R&D expenditure for the EU aluminium industry was estimated at €260 million in 2005. It should be noted that much of the research expenditure takes place in research institutes of the first processing industries, which are not covered by this data. R&D focuses on energy efficiency, eco-efficiency and reduction of emissions, with a strong emphasis on recycling. As far as production processes are concerned, the current technologies are relatively mature. However, industry is looking for new technological solutions and applying newly developed techniques. In terms of environmental performance and optimum use of energy and raw materials in the refining, recycling and processing of non-ferrous metals, the sector has already achieved substantial efficiency gains.

In 2005, the aluminium industry formed a voluntary European Aluminium Platform, focusing on new modelling tools that integrate nano- and macro-scale data and models, the ultimate aim of which was to reduce the time for development of new alloy routes by 30%, to lower energy consumption in semi-products by 10% and expand the product range through better tailored semi-product properties. The non-ferrous metals industries can also participate in the European Technology Platform on Sustainable Mineral Processing.

Knowledge and skills

While one of the industry's major strengths is a skilled and available workforce, it is nevertheless faced with a problem of an aging workforce and the need to attract new employees. Industry is also focusing on the life-long learning concept, on-site training and e-learning. Concrete initiatives have been launched within the aluminium industry, thus increasing the number of life-long learning internal training programmes to improve the effectiveness of its staff.[86] At EU level, the issue of sector-specific skills shortages has been addressed in the Sectoral Social Dialogue Committee.

Market structure: Competition

The EU metal industries are operating on the global market. The recent economic developments in many emerging economies have contributed to the increase in demand and prices for metals and metal products, heightening the pressure on global markets for raw

[86] The aluMatter, innovative and interactive e-learning platform, run by the European Aluminium Association (EAA), http://aluminium.matter.org.uk/content/html/eng/default.asp?catid=&pageid=1 contains learning modules on aluminium technologies and material science, which receives over 1000 visitors daily.

materials and their prices until the first half of 2008. For example, in 2007 China - formerly a net importer of metals - took over first place in the worldwide production of aluminium (27%), copper (17%) and lead (34%), and even 74% of magnesium. Prices at LME had decreased steadily for two decades until 2003, and then started gradually to increase, posting rapid growth for copper, zinc and nickel in 2006. This price increase continued, but at a lower rate, until July 2008. In the last ten years, aluminium prices have doubled, while prices for copper, nickel and silver went up almost fourfold. The peak prices were reached in the summer of 2008. By end 2008, the prices of non-ferrous metals were falling steadily. The drop in demand led to an increase in stocks. The primary aluminium price is back down at its 2002 level, having fallen 50% from the peak in August 2008. The price mechanism limits the capacity of non-ferrous metals producers and processors to pass their costs on to their customers. Therefore, instead of directly reflecting production costs in Europe, prices are influenced by the growth of worldwide demand for both raw materials and metals.

The EU non-ferrous metals industry accounts for one fifth of the world's refined metal production and at least one third of the world's output of semi-manufactured products.

Demand for metals in Europe is significantly higher than production. For primary aluminium, EU imports in 2007 supplied approximately 38% of its needs. 39% was met by recycled metal and only 23% by EU primary aluminium production. EU copper production accounts for 25% of world demand (23 million tonnes). Various forecasts stress that the situation will become even worse, for example, for zinc. Local demand - at around 2.4 million tonnes - was met by EU production until 2005, but in 2012 the shortfall is expected to be around – 0.4Mt).

The level of integration of the EU non-ferrous metals industry differs from metal to metal. In the period 2006-2008 there were 17 merger/acquisition cases, of which the largest number was in the aluminium sector (with five cases concluded). The EU primary aluminium sector is the most integrated, being dominated by three multinational companies. The most recent big merger took place in 2008 in the copper sector, leaving practically no future scope for mergers in the primary copper sector.

Market structure: Regulation

Better regulation and simplification are issues that are relevant to the environment, as they include chemicals legislation (REACH), waste and recycling legislation and energy policy.

Environment

More than 70% of EU refined lead production, nearly 60% of aluminium production and over 40% of refined copper production originate from scrap metal. Consequently, recycling of scrap metals is one of the most important elements determining the competitiveness of the sector. A first set of "end-of waste" criteria determining when certain recyclable materials cease to be waste is expected to be adopted by the end of 2009. Better implementation of the waste legislation, especially the Waste Shipment Regulation, is another challenge, because of irregularities and illegal shipments.

The REACH Regulation is another related legislative initiative, where consistency with waste legislation is of the utmost importance. The implementation of REACH started with a pre-registration of substances, and the non-ferrous metals industry formed numerous consortia

and set up a special helpdesk. The risk assessments (RA) on zinc, nickel, lead and copper will provide estimates of the individual risks to health and the environment resulting from their use. The lead and copper RA are voluntary risk assessments developed by the industry in close cooperation with the competent authorities. In this context, to assess the hazard and risk, appropriate methodologies are being discussed in order to take account of the specificities of metals, their compounds and alloys. Also, consistency with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is of the utmost importance.

As large emitters of CO_2 (in the form of both direct and indirect emissions from electricity use), the non-ferrous metals industries are very concerned about the legislation concerning green house gas emissions and climate change. Under the revised ETS directive the non-ferrous metals sector will (from 2013) be covered by the EU's emissions trading regime. As the sector is generally highly energy intensive, different sub-sectors such as aluminium, copper, zinc and other non-ferrous metals are under scrutiny in the currently ongoing assessment of energy intensive sectors that may be subject to carbon leakage. Sectoral approaches based on industry-specific conditions that are especially relevant to the aluminium industry are being explored.

The non-ferrous metals industries are included in the IPPC Directive. The Reference Document on Best Available Techniques (BAT) for the non-ferrous metals sector, which is used to issue permits, is being revised and is expected to be finalised in 2009. The recast of the IPPC Directive proposes to simplify existing legislation on industrial emissions while strengthening the role of BAT. It follows the co-decision process (EP 1st reading opinion in March 2009).

External competitiveness

The European Union has become the main net importer of refined non-ferrous metals in the world, and its dependence on imported metals has grown in recent decades. In 2006 the EU-27 had a trade deficit of €25.9 billion in basic precious metals and other non-ferrous metals. A large part of the deficit is explained by the sharp rise in prices. The main exporters of basic precious and non-ferrous metals to the EU overall were Russia (14.8%), Chile (12.4%) and Norway (10.4%). The main imports to EU 27 were aluminium and aluminium products, copper and precious metals. Germany was the biggest exporter of non-ferrous metals.

Prioritising the establishment of a level playing field for metals and raw materials in its trade policy remains the main challenge for the EU in its relations with the industrialised countries and emerging economies. The industry is concerned about specific policies and practices put in place by third countries to restrict their exports of scrap metal to the EU or to foster their imports of scrap and other raw materials imports (Russia has export taxes of up to 50%). In particular, as regards aluminium and copper scrap, the EU market has seen significant reductions in imports and rapid growth in exports due to the high demand in emerging economies, especially China. Over the past 8 years (1999-2007), EU imports of non-ferrous and precious metals scrap have fallen by nearly 40%, while exports have risen by more than 125%.

Employment and geographical dimension

There were some 3,590 enterprises in the EU27's basic precious and non-ferrous metals manufacturing sector, which employed 217,700 persons across EU27 in 2006, as well as 4056

enterprises employing 117,000 people in the casting sector for light metals and other non-ferrous metals. The biggest producer country for non-ferrous metals and precious metals in EU27 is Germany, which leads the field in refined (primary) aluminium and copper (including semis), refined (but also secondary) lead, and cadmium production. France, Spain and the UK are also big producers of aluminium. Other copper producing countries apart from Germany are Poland, Belgium and Spain. Italy is a big producer of aluminium and copper semis. The biggest producer of zinc is Spain, followed by Finland and Germany. For nickel the biggest producer is Finland, followed by UK and Greece, and Belgium for tin. The level of production has remained relatively stable over the past four years (2004-2007).

Areas of growth (within the sector)

Further development of the non ferrous metals industries in Europe will be based on innovation, improving quality of products, the search for niche markets and new products to respond to market needs (i.e. making use of the antiseptic qualities of copper, new advanced alloys for conductors, etc). For copper, 65% of annual European demand is currently used in the generation, distribution and use of electricity. This area has the biggest potential for the promotion of renewable energy use by wind turbines and in vehicle technology. As for new applications, the aluminium industry sees huge potential in the further use of aluminium and aluminium alloys in the automotive industry. For zinc, the new area is electronic applications with transparent displays, where silicon will be replaced by a thin layer of zinc tin oxide. Another trend is the use of zinc-air batteries, which give benefits compared to lead batteries and weigh less. Further use of nickel in batteries is planned. The demand for platinum will remain high in the automobile sector, with a new focus on its application in fuel cells. Greater use of magnesium is expected in waste water treatment and to replace lime in eco-cement, as magnesium burns at temperatures four times lower than lime.

Response to structural change

Several closures and mergers have taken place during the past 15 years in the aluminium, copper and zinc industries and have resulted in a large-scale consolidation of the primary metal sectors.

In the case of primary aluminium production, energy prices determine the location of smelters. It is possible that most primary aluminium smelting capacity in Europe might be shut down over the next 20 years and new investments made in countries with lower energy costs. The current crisis may result in further plant closures. As a first step, the industry has reacted by announcing cuts in production. The downstream sector is being hit hard by the difficulty in accessing raw materials at competitive prices, so special measures are needed to ensure a level playing field. Low profitability may cause some plant closures in the downstream sector.

Structure of sector

Vertical integration is uncommon, except in the aluminium sub-sector; companies mostly specialise either in metal refining or in metal processing. In general, raw materials for non-ferrous metal production are supplied by specialised, independent mining companies or scrap dealers. Most companies in the refining segment are large groups with an international presence. The processing segment is composed of a large number of SMEs, with only a few big groups.

In 2007, 24 primary aluminium smelters were operating in the EU, and a further nine in the EEA Primary aluminium is a global market that is highly concentrated: The top three producers account for more than 32% of the global market. In Europe, the number of companies involved in secondary aluminium production is much larger (265). There are over 2 300 plants in the semi products and casting sectors combined. In the copper sector there were around 15 copper smelters and refineries in Europe in 2007. In the zinc sector there were 11 zinc smelters operating in Europe. Due to the economic crisis, one zinc smelter closed down in late 2008 and a primary aluminium smelter was closed in early 2009.

Sector-related services

The most important services for the non-ferrous and precious metals industries are related to transport, logistics and the supply of electricity (energy). Because non-ferrous metal production is highly electricity-intensive, the EU non-ferrous industry has been affected by increasing electricity prices. Some of the industries (aluminium, copper) have traditionally been covered by long-term energy contracts. As most of the existing electricity supply contracts will be coming to an end between now and 2013, the industry will have to replace them by new contracts potentially at less favourable terms. This remains a major concern, as the predictability of prices and access to energy is crucial to the industry.

LME warehouses are located on all continents (15 locations in Europe, eight in Asia and eight in North America). The price of the transport of metal is included in the premiums added to the LME metal price. Transport costs are heavily dependent on the market segment (e.g. containers, oil tankers, dry bulk). As transport by sea is more efficient than land transport, decisions made on the location of installations take this into consideration.

Vulnerability to financial crisis

- The main expected effects of the financial crisis on the sector are higher capital costs, reduced access to credit, lower domestic demand and weaker growth in international trade.

- The sector is highly dependent on demand from its main consumer sectors, such as construction, mechanical engineering, aviation or the automotive sector. The demand for non-ferrous metals is closely tied up with the development of industrial investments and demand for final products.

- Reduced activity in the automotive and construction industry has already resulted in a decrease in metals production. The existing overcapacity in some sub-sectors in Europe is expected to increase.

- The processing segment is made up of a large number of SMEs, which are facing problems of financial liquidity due to limited access to credit, the reduction or cancellation of orders and delayed payments. This will have an impact on the various stages of production up to the finished product.

- These industries are very capital intensive. It is difficult to reduce or increase production levels in response to changes in demand in the smelting and refining business because it is not easy to adapt the capacity of furnaces or electro winning installations; this leaves the metal industry with high operating costs. Where it is technically possible, however, the industries are reducing their production (cuts of 13% in primary aluminium production in Europe were announced in January 2009, for instance).

- For this reason, cancellations of orders have already led to stock increases, with the corresponding financial costs to industry. There is a serious risk of closures due to overcapacity.

- Metal prices fell substantially in the closing months of 2008 and this will have an impact on companies' profitability. It will also affect their financial situation and the possibility of getting credit either for investment or as working capital.

- Moreover, the financing of working capital is becoming more difficult, which has led to a request from the semi-fabricators to delay payment in their commercial transactions. This could lead to serious delays in payments in the near future. Another immediate effect is the insecurity of transactions, since in the majority of cases these are not guaranteed by the banks.

- The non-ferrous metals sector is facing strong and growing competition from emerging markets. Because of its global nature, a decline in demand could further stoke the competitive pressure on metals markets.

- Due to high energy intensity and high energy costs, the sector is highly vulnerable to the level and volatility of energy prices. While metals prices have dropped considerably, electricity prices have stayed high.

- Under the unilateral European carbon constraint, the costs of CO_2 allowances for electricity generation have already been passed on to the electricity price. This is a matter of concern for the non-ferrous metals industries.

- Production cuts (felt particularly acutely in the aluminium industry) are expected to reduce excess capacity over time.

24. PHARMACEUTICALS[87]

Basic facts and figures on the sector

In total manufacturing, the pharmaceutical industry represents a workforce of over 600.000 employees in the EU27, with more than 100,000 in R&D alone. The industry has experienced steady growth, but at a slower pace than in the US. Value added per employee is very high – about one third higher than in other high-tech industries.[88]

Competitiveness assessment

Several factors are likely to drive down investment returns and limit the industry's ability to attract money for R&D in future medicines. These factors are: declining R&D productivity; major blockbuster drugs whose patents will run out by 2010; patents with shorter exclusivity periods, due to public pressure and subject to challenge by developing countries and newly industrialising countries; the rising costs of commercialising a new drug; and mounting price-pressures exerted by governments and/or private insurance schemes. Other concerns are the lack of competitive national markets in Europe and the fragmentation of the European market; the inadequate protection of intellectual property due to the delays in the implementation of the Biopatent Directive, and the lack of a Community patent; poor coordination between private and public funding of research and across borders; and the inadequate level of exchange between the academia and the business community.

A balance has to be struck between competitiveness based on market considerations on the one hand and public health (including issues related to limited public financial resources) on the other hand in order to ensure patients' access to innovative medicines. Another element contributing to the competitiveness of the industry and the acceptance of its products by patients and healthcare providers is product safety. Europe has traditionally put safety first and has recently taken steps to raise the level even further by adopting legislative initiatives aimed at tightening the rules on pharmacovigilance and the safety of medicines in the distribution chain.

R&D and innovation

The EU is lagging behind the US in R&D spending (US R&D budgets are more than one third higher than in the EU). Increased R&D investments seem to have led to more pharma/biotech patents in the US. Declining productivity results in increased R&D costs. For every 13 compounds discovered, only one now makes it to the market and is tested in pre-clinical trials; this compares with a rate of one out of eight between 1995 and 2000. The main reasons for candidate drugs failing to reach the market are: lack of efficacy and of pre-clinical and clinical safety. This may be due to the fact that the industry is adopting new technologies to create new medicines (biotech, nanotech) and is still acquiring the necessary expertise in applying new methods and technologies. The experience base with these technologies is relatively low compared to chemical technologies, which have formed the technological basis for R&D since the beginning of the modern pharmaceutical industry. However, breakthroughs

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87 NACE 24.4

88 Source: 'The Pharmaceutical Industry in Figures 2008 edition', European Federation of Pharmaceutical Industries and Associations.

in life sciences are transforming the process of drug R&D, which will lead to more individualised medicines and ultimately to tailor-made medicines. In this context, the Innovative Medicine Initiative will provide a technology platform to accelerate pharmaceutical drug development and to tackle the current bottlenecks in the pre-competitive phase of the drug development process, thus helping to restore Europe as a leading centre for pharmaceutical R&D.

Knowledge and skills

The pharmaceutical industry is a specific industrial sector with an important health aspect. Another factor which needs further attention is the skills base in Europe, as there seems to be divergence between the needs of industry with regard to skills, particularly in the field of chemical and biotechnological research, and the skills available in the labour market.

Market structure: Competition

Access to finance for SMEs, especially to venture capital, is increasingly becoming a problem as it creates a barrier to the development of new bioscience companies. EU-investors (as compared to those in the US) tend to be more risk averse, an attitude which aggravates this problem. Low revenues also affect those SMEs which are engaged in low-margin markets, such as herbals and over the counter, i.e. prescription-free medicines (OTCs). There seems to be a need for more support for SMEs, both for clustering and for innovation policy. The Commission has published its report on the competition inquiry into the pharmaceutical sector (launched in January 2008), which states that there are certain hurdles to competition.[89] Furthermore, it voices concerns that originator companies have engaged in practices to delay or to block the market entry of competing medicines. The inquiry focused on causes which may block or delay generic competition and/or block or delay the development of competing originator products. As the industry is strongly regulated, the sector inquiry also looked at possible shortcomings in the regulatory framework or its implementation which may lead to these phenomena.

Market structure: Regulation

Market Authorisation legislation is harmonised at EU level and guarantees a high level of product safety. The legislative framework was the subject of a major review, the main aim of which was to support the competitiveness of the sector, as well as ensuring a high level of public health. The new legislation came into effect in November 2005. The G10 Group highlighted some critical areas of national competence that have a major impact on the European industry, in particular the variety of national pricing/reimbursement schemes and the divergence in the increasing use of cost and clinical effectiveness criteria by national administrations. Given the current strong pressures on national healthcare budgets, Member States' authorities are trying to curb costs by focusing on pharmaceutical expenditures. The use of relative effectiveness assessments of new medicines (so-called HTA) is now being adopted by almost all EU Member States in order to obtain information about which medicines they should spend their limited pharmaceutical budgets on. This approach will probably require companies to provide increasing amounts of data on the value added of new medicines. The Pharmaceutical Forum has started increasing transparency and potential

[89] COMMUNICATION FROM THE COMMISSION (2009), Executive Summary of the Pharmaceutical Sector Inquiry Report

convergence in the field of pricing/reimbursement and relative effectiveness/HTA. The field of relative effectiveness seems to be particularly relevant, given its complexity and the general acceptance that the knowledge/expertise in an individual Member State is often insufficient. Nevertheless, the big differences between EU Member States in wealth (GDP/capita) and in the approaches taken by national authorities in pricing and reimbursement in this field will have to be dealt with. The lack of conversion/harmonisation, and the consequent duplication of efforts and the need for additional resources, makes regulation a major barrier for companies in the EU. This means not only that companies are unable the reap the full economic reward by not being able to be present in all European Member States, which is in particular a problem for SMEs, but also that patients in smaller or less wealthy markets are less likely to have access to a number of new medicines.

The EU is facing major health, economic and scientific challenges which may cause it to lose ground in pharmaceutical innovation, and European patients are suffering from inequalities in availability and affordability of medicines and from the rise in counterfeit medicines. To address these challenges, the Commission proposed a regulatory 'Pharmaceutical Package'[90] on 10 December 2008.

Environment

The impact of REACH will mostly have an indirect impact, as chemical substances used in the pharmaceuticals sector are excluded from registration and authorisation. In addition, pharmaceuticals research can benefit from a 15-year exemption for Product and Process Oriented Research and Development (PPORD). Like other sectors, the pharmaceutical industry is subject to the legislation on waste. Pharmaceuticals industries and laboratories (as well as the health and survival of our species) depend on the discovery of new molecules often found in bio-diverse ecosystems such as forests. They therefore share the responsibility to protect those pools of remedies for future generations.

External competitiveness

The EU generates a trade surplus in innovative pharmaceuticals (approximately €28 billion) which has increased in the past decade. The pharmaceutical sector is the single most important sector contributing to the trade surplus when compared with other high tech sectors. The EU industry is becoming increasingly dependent on the US, both for its exports and its imports. Since the early 1990s, there has been a decline in the competitiveness of the industry, particularly when compared to the US. Since biotech began in the US the first-mover advantages still seem give the US a competitive advantage, leading to a constant brain drain from Europe. Market access to third countries is still a major source of concern for European companies, particularly as a result of regulatory hurdles. Some of these markets are growing rapidly, in particular China (now already as important as a market as France) and India. Furthermore, the partial or non-implementation of the TRIPS agreement in many important overseas markets puts European industry at a disadvantage. Indian and Chinese companies will play an increasingly important role in the global market. Indian companies are traditionally strong in the generics field, which will grow significantly in the coming year given the expected patent expiries. Chinese companies are already playing a major role in production, while the Chinese government has selected the field of pharmaceuticals as one of

[90] For more info go to ec.europa.eu/enterprise/pharmaceuticals/

its primary focuses for research investment. Both countries have recently adopted IP/patent rules, but their historical lack of IP has definitely helped develop their local pharmaceutical sectors.

Employment and geographical dimension

The sector employs over 630,000 people, of whom around 117,000 are employed in pharmaceutical R&D. Most of the jobs in the sector are located in Germany, France (over (100.000), Italy, UK (around 70.000), Spain (40.000), Switzerland, Belgium (around 30.000), Ireland and Poland (around 25.000). After a significant increase at the beginning of the decade, the level of employment has remained stable since 2005.[91]

According to EFPIA (European Federation of Pharmaceutical Industries and Associations), the research-based pharmaceutical industry is one of Europe's leading high-technology industrial employers. Besides, it generates three to four times more employment indirectly than it does directly, a significant proportion being high value added jobs (e.g. clinical science, universities, etc).

The Eurostat data for 2004 shows that the main generators of value added in pharmaceutical products in the EU-27 were Germany (19.6 % of the EU-27 total), France (18.2 %) and the United Kingdom (15.4 %). However, Slovenia, Sweden, Belgium and Hungary were the most specialised pharmaceutical producers (data for Ireland are not available) with contributions to the value added of their respective national, non-financial business economies.[92]

Areas of growth (within the sector)

The generic segment is expected to enjoy constant growth rates over the coming years, given the multiple patent expiries. The relatively low number of new medicines that is reported in the R&D pipeline of research-based companies will probably lead to a restructuring in the innovative sector. As biotechnology and nanotechnologies are becoming more mature, new active substances that have been developed by applying these technologies are likely to be used more frequently by the pharmaceutical industry, although there is a development time of five years before these active substances can be developed into medicines entering the market. The OTC segment is likely to be less influenced by technology and/or economic changes. We can expect to see efforts to relaunch medicines that have come to the end of their patent life as prescription-free medicines in order to extend their economic "life span". The herbal medicines segment is also likely to grow in response to societal preferences, as is the importance of traditional medicines, including those of non-European origin. Finally, medicines to be developed for the needs of an aging population should also see dynamic growth over the next decades.

Response to structural change

The introduction of the Innovative Medicines Initiative will address some specific bottlenecks in development of new medicines, particularly in relation to new technologies. This will accelerate the development of new medicines by harmonising the regulatory steps needed to

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91 Source: The Pharmaceutical Industry in Figures 2009 edition, European Federation of Pharmaceutical Industries and Associations.

92 Source: European business. Facts and figures 2007 edition, Eurostat

enter the market. Marketing authorisations have been successfully harmonised in the EU over the last ten years. Some steps might be expected in the field of relative effectiveness/HTA, which is gaining in importance. Pricing and reimbursement will always remain a national competence, where inter-governmental collaboration can at best only be promoted and facilitated.

Structure of sector

The sector is currently dominated by about 25 global big pharma players, each with an annual turnover of more than €10 billion, tailoring their products portfolio according to key segments (cardio, gastro, oncology, neurology etc.) based on their specialist expertise and/or sales market potential. In addition, there is now a larger number of relatively small global players, which focus on one segment of the pharma market and are often market leaders in their respective fields. In addition to a multitude of generic producers that vary in size and market share (from very small SMEs to multinationals, sometimes integrated firms, i.e. covering innovative as well as generic products), the sector is also characterised by numerous start-ups and SMEs, developing one or more new candidate medicines, increasingly in the biotech field. Often these become linked to big-pharma through licensing deals or acquisitions, at a stage when the candidate medicines have proven potential and need to undergo costly late-phase development and marketing effort.

Sector-related services

In addition to the companies developing and marketing medicines, there is also a large group of different SMEs, who carry out just one task in the pharma-process: e.g. Clinical Research Organisations (CROs), technology platform developers, production facilities, and marketing offices. Lastly, a network of wholesalers and pharmacists is needed in order to bring the medicines to the patients. Some consolidation has been seen in these groups in recent years.

Vulnerability to financial crisis

While the financial crisis has spread to the wider economy, the potential ramifications for the biotech and pharmaceutical sector are still difficult to gauge, given the early stage of the crisis and the diverse nature of the sector concerned. This is particularly true for biotech, since biotechnology is applied as an enabling technology in various industries. As for the European situation, it seems that European biotech companies are less exposed to cash shortages than their American counterparts. In Europe fewer than 20% of biotech micro-caps have less than 1-year resources, as compared to 65% in the U.S.[93]

Companies in the pharmaceutical and biotech sectors are likely to be less directly affected than most others, because the demand for health care is relatively independent of the trends troubling the wider economy. The fundamental drivers of demand for drugs, i.e. the prevalence of disease, unmet medical needs, population growth, and an aging population, are relatively independent of the wider economy. Consequently, demand is expected to continue to grow over time and is relatively inelastic compared, say, with the demand for cars, holidays or restaurant meals. This makes the sector more attractive than others in tougher economic conditions, and this is reflected in the health care sector's relative stock market performance

[93] Source: Nature Biotechnology Number 1, Volume 27, Jan. 2009.

through 2008, since some investors consider stocks of big pharmaceutical companies a "safe haven".

However, tougher economic conditions, particularly in industrialised countries, are bound to have an impact on society's ability and willingness to pay for drugs. This factor will become apparent both in the publicly funded health-care systems and in the private-payer market. It remains to be seen whether market shares in emerging economies can offset this potential slowdown.

The pressure on public health care budgets and drug spending will arise from a combination of several likely developments. The pharmaceutical industry – including generics - as part of the wider healthcare industries can expect to come under significant pressure from major purchasers, e.g. governments and insurance companies, to contain spending on medicines.

Compared with some other sectors, the biopharma industry is relatively underleveraged and many companies have significant cash reserves. Average net debt as a proportion of capital employed for the top 20 pharmaceutical companies is just 6 percent, compared to 95 percent for financial institutions. At the end of June 2008, nine of the largest U.S. biopharma companies had more than $105 billion in cash and short-term investments between them.[94]

Smaller specialty pharmaceutical companies and "red biotech" companies are likely to be more exposed. Unlike large pharmaceutical companies, biopharma companies tend to be relatively new entities, which have not yet launched their own products and therefore have no operational revenues. Consequently, these firms depend heavily on external financing from the financial markets. Many of these are niche companies with little in-house research and often lower credit ratings that limit access to capital markets. As a result of the financial crisis they are likely to face difficulties raising the funds they need to fuel the flow of the new products on which they rely. As sources of future funding become tighter, the effects are likely to be felt increasingly, in particular by the smaller biotech companies.

[94] Source: Collateral Damage; Industry Focus, Implications of the Financial Crisis for the Biopharmaceutical Sector, The Boston Consulting Group, November 2008.

25. PRINTING[95]

Basic facts and figures on the sector

According to the latest structural data available, the printing sector[96] employed 960,000 people in 133,000 firms in 2006. Altogether these firms have a turnover of €106 billion and an added-value of €42 billion. Production in the printing industry has declined since 2000, picking up from 2004 onwards. However, in 2008, production declined by 4.5%, posting a sharper fall of 6.5% in the fourth quarter. A similar decline close to 6.5% in production occurred in the first quarter of 2009 as compared to the same period of 2008.

Competitiveness assessment

The various electronic/digital printing processes represent a growing share of the printing activity and are a significant asset for the industry in that they help strengthen new market opportunities and niches. The specificities of each process make them complementary rather than being a substitute for conventional printing processes.

Strengths:

- all stages of the graphic industry value chain present in the EU;
- good technology endowment;
- modern and efficient production facilities, with a dense and reactive network of small companies;
- tradition of research and innovation;
- efficient environmental approach.

Weaknesses:

- average size too small and divided;
- overcapacity and low utilisation of capacity;
- poor international experience;
- weak negotiating power/position.

Opportunities:

- differentiation strategies available and possible according to size or activities of companies;

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95 Figures in this section are from Eurostat.

96 NACE 22.2

- increased "service-orientation";
- development of multimedia technologies.

Threats:

- increased global competition;
- relocation of customers' activities in emerging countries;
- intense price pressure and difficulty to build sustainable and qualitative differentiation;
- potential disconnection from innovation proposed by suppliers likely to jeopardize structural innovation.

R&D and innovation

The sector is focusing on the development of innovative printing solutions and services to facilitate customer differentiation and development, aimed at establishing a knowledge transfer network involving other stakeholders, in particular research centres. Investment geared towards final customer expectations, services management, and multi-channel solutions are key current and short-term requirements. The printing industry needs to integrate new technological standards of content management (XML, etc.), quality management (ISO standards) and workflow management (JDF and JMF). In the field of market research developments and foresight, printers need a good overview of trends not only in printing, but also in advertising, internet and mobile communication use, in order to adapt their services.

Knowledge and skills

In printing production, skills requirements are widening and there is a need for more flexibility and mobility. The most significant developments are to be found in pre-press, which acts as an interface between customer and production. Thanks to both creative skills and in-depth technological insight, their involvement enables optimization of printed products.

Market Structure: Competition

Both the printing and publishing industries typically focus on national or regional markets. The industries are generally fragmented, although there are some large European corporations which are both publishers and large-scale printers. The printing industry is facing various new competition factors, which range from the growth of electronic media, moving into new markets, and developing a more customer oriented market strategy, to competition from low production cost countries.

Market structure: Regulation

The printing industry relies on adequate commercial regulations in the publishing sector. In addition, one of the main regulatory issues is environmental legislation.

Environment

Complying with air quality legislation remains a major requirement for the printing industry. The recast of the IPPC Directive, which will merge this instrument with, inter alia, the Solvents Emissions Directive, proposes to simplify existing legislation on industrial emissions while strengthening the role of BAT. It currently follows the co-decision process. The printing industry is also affected by other environmental policy areas: the implementation of REACH, the Thematic Strategy on the Prevention and Recycling of waste, and the Thematic Strategy on Air Quality, Integrated Product Policy and Water Quality. In the printing industry there has been a proliferation of certification schemes, i.e. Chains of Custody or ISO schemes, such as ISO 14001 which specifies the requirements for an organisation's environmental management system. A specific Quality Standard, mostly used in offset print production, allows the printer to print to the highest possible quality with the existing equipment. Quality standards, which require a rationalisation of processes, are also beneficial to environmental protection.

External competitiveness

The internationalisation of the printing sector is growing in some market segments as a result of the enlargement of Europe and increased competition world-wide. Globalisation affects mainly book printing and packaging print, including manuals. At European level some characteristics of the printing industry in individual countries strengthen its competitive position for some specific products, such as the development of gravure printing in Germany, which serves the magazine printing market. The EU is traditionally a net exporter of printed products; its trade surplus reached €2.5 billion in 2008, slightly lower than in 2007. Exports have fallen slightly from €5.8 to €5.7 billion, while imports have broadly remained stable at €3.2 billion. The main export markets for the EU are Switzerland, Russia and the United States. The major suppliers are the USA, China and Switzerland.

Books and packaging products are the main product traded on the world-wide market. Imports from Asian countries, particularly from China, have been growing steadily over the last ten years, particularly on the market for books and printing of children's books.

Employment and geographical dimension

Employment in the printing industry has declined regularly in recent years. In 2008, a further decline of 2% is anticipated. The great majority of printing companies are SMEs who operate in very localised markets. As a result the industry is widely dispersed throughout the EU. In each of the bigger Member States there are large global players, but no individual country has a particularly high concentration.

Areas of growth (within the sector)

The fastest developing market segment is digital printing, which is making it possible to satisfy new market requirements for the individualization and personalization of printed products.

Response to structural change

Structural changes and new competition factors were analysed in-depth in a survey on competitiveness, with the support of DG Enterprise and Industry. An industry-wide Action Plan was prepared with the aims of managing production costs, finding a new growth base, developing the European printing industry, investing in human resources, making the EU printers a reference in the field of environmental and H&S performance, and improving the image of the printing industry.

Structure of sector

The sector essentially consists of SMEs, who make up some 80% of companies. Consolidation and various forms of partnership are developing, particularly among the larger companies. SMEs are particularly involved in niche markets.

Sector-related services

The printing industry is also developing the range of complementary services it offers to customers. Examples of new service areas are: web to print services, content management services, community printing (related to the community websites) services, fulfilment services or logistics management.

Vulnerability to financial crisis

As in other industrial sectors with a large number of SMEs, the current financial market conditions make access to financing difficult. Furthermore, growth in the printing industry relies in various respects on trends in upstream industry sectors. The printing industry's production level depends on orders for advertising, commercial printing etc. The marked economic slowdown/recession is therefore having a negative impact on business prospects.

Production in the printing industry had been enjoying positive trends in 2006/07 and during the first half of 2008. The market segments performing particularly well were book printing, advertising material and posters. Customized printed products, particularly in advertising and direct mail products, were becoming increasingly important. However, newspaper printing was facing structural changes already before the onset of the economic crisis of 2008/9 due to changing habits among the population and in orders from directory publishers. In some countries this trend led to less newspaper printing, although this is balanced out to some extent by free sheet printing.

A deterioration of business trends was visible in the fourth quarter of 2008 and in the first quarter of 2009, which impacted on various products and particularly on advertising printing, which represents about 30% of the total market for printing (NACE 22.2).

Although the situation has the potential to evolve rapidly, the employment level in 2009 has not yet been significantly affected by the negative business trends. The sector had already implemented rationalization plans in recent years. In addition, the work force of the printing industry is strongly affected by ageing trends, and the number of workers leaving the sector is higher than those coming in. Up to the end of 2008, some countries were reporting a shortage of skilled workers.

26. PULP, PAPER AND PAPER PRODUCTS[97]

Basic facts and figures on the sector

Apart from a slight fall in 2005, production in the "pulp, paper and paper products" sector[98] has increased steadily, by more than 12% between 2002 and 2007. However, in 2008, production was 2.5% lower than in 2007, and turnover in 2008 was almost the same as in 2007, marking a change in the trend from the previous years. Employment fell by 15% between 2000 and 2008. According to the latest structural data available, there were 19 377 firms employing 715 000 people in the sector in 2006. Turnover reached €166 billion and added value €41 billion. Wage-adjusted labour productivity (the relationship between apparent labour productivity and average personnel costs) was 145% and the gross operating rate (the share of operating surplus in turnover) was 9.9%. Within the sector, in 2006 "pulp manufacturing" represented 5 % of the added value and 2% of employment, "paper manufacturing" 39 % and 29 % and "articles of paper and paperboard" 56 % and 69% respectively.

Competitiveness assessment

As is the case for other forest-based industries, the costs of energy and wood, which provides about half of the fibre source for paper-making, play a crucial role for the pulp and paper sector. The overall costs for paper-making break down as follows: fibres 32%, capital 18%, personnel 14%, energy 13% and chemicals 12%. The sector has high levels of post-consumer paper recovery and recycling, and provides renewable energy by burning wood bark and rejected wood, as well as using black liquors from chemical pulping to produce CHP and steam. Overall, just over half the process-making process energy consumed is produced in this way. Some pulp mills even export electricity to the grid.

Although paper production in the US already peaked several years ago and has been declining for certain graphic papers, during the last two decades overall production in the EU has continued to rise, even though grades such as newsprint have slowed. As a result, over the last two decades, the growth of EU paper production has averaged + 2.8 % p.a., whilst consumption has climbed on average by + 2.5 % p.a. Whilst some graphic grades in the former 15 EU Member States are maturing, the expansion of IT for business, education and packaging is leading to faster growth in the new Member States. Carbon paper production has shrunk. The converting sector has not seen much overall growth, but an ageing population means a long-term increase in household and sanitary products, but a slowing down for certain stationery goods. The stable but ageing EU population offers little long-term scope for growth in overall demand, especially once the new EU Member States' "catch-up" phase is over. EU pulp production has grown more slowly, averaging +1.6 % p.a. since 1991. This is mainly due to the increased use of recycled fibre for paper-making, but also because some old pulp mills have closed, thus partially offsetting the increased output from the up-grades or re-

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97 Data in this section is derived as following: Eurostat (for production, employment, turnover, labour productivity), - For the statements on major pulp and paper groups and the economic crisis (falling in net benefits, need to curtail production): specialised press, confirmed by press releases from the pulp and paper groups (for ex Storaenso and UPM – which are the first and third most important groups respectively in the EU).

98 NACE 21

builds of remaining plants. There have been very few opportunities in the EU for new pulp mills since EU companies find the sub-tropics more attractive for their "green-field" investments.

Non-EU competitors do not have to bear the high costs of compliance with strict environmental regulation that prevail in the EU. Since most pulp and paper grades are effectively commodities, prices are set by the lowest-cost producers on the global market. The continuing development of electronic media has meant a reduction in certain paper-based printing and publishing segments, such as newsprint. Distribution patterns are also changing, for example smaller, local print batches of publications; this is partly to offset increasing road transport costs. Nonetheless, other "smart" applications of technology, such as intelligent paper and packaging, are providing new market opportunities.

Strengths:

- sustainable and increasing forest resources, producing most of the EU fresh wood raw material;
- high level of know-how and continuous innovation for: raw material collection, recovery and use; products; production processes; distribution.
- excellent sectoral knowledge centres, including for RTD;
- proximity of large, sophisticated domestic market and nearby export markets.

Weaknesses:

- non-mobilisation of legally harvestable but uncut wood growth from EU forests.
- high fixed and variable costs, including: wood, chemicals, energy and (for conversion) labour;
- investments becoming more attractive in the sub-tropical regions;
- poor public image, especially amongst young people;

Opportunities:

- harnessing increased mobilisation of wood for both paper products and renewable energy (for wood manufacturing and grid supply);
- even higher level of post-consumer paper recovery, re-use and recycling, including energy extraction;
- development of innovative and added-value products and systems, including "smart papers" and packaging;
- export markets (e.g. India, Mercosur, Near East) for added-value items such as security and other high-grade graphic papers, as well as speciality products;
- ageing population with growing need for hygiene products.

Threats:

- increasing competition for wood raw material from the renewable energy sector;
- growing supply of low-cost and high-quality imports of commodity-grade papers, especially from China;
- constricted supply of imported wood raw material from Russia;
- continuing market access restrictions (e.g. India, Mercosur; Near East);
- phytosanitary issues (e.g. pinewood nematode outbreak risks reducing raw wood supply from EU forests);
- impact of climate change on forest health and productivity;
- indirect impact of competition for fertile land by agriculture and bio-energy crops;

R&D and innovation

Energy and environmental issues, and developing more added-value, specific user qualities and production technologies, are the main RTD challenges for this sector. The Forest-based Sector Technology Platform (FTP) was set up to address these and other sectoral issues and is based on the "value chain" from forests to wood-based consumer products. The FTP finalised its Strategic Research Agenda (SRA) in May 2006. The SRA has groups for forestry, wood products, pulp and paper products and bio energy which link, where relevant, to other TPs, such as those for Bio-fuels and Sustainable Chemistry. Research on pulping and paper-making is normally carried out by specialised institutes under contract from industry, but often some State support is also available.

Knowledge and skills

In recent decades, the EU has been the world leader in pulp and paper know-how, but in order to retain this position the technology lead must be constantly up-dated, because technology spreads worldwide as experts are globally mobile.[99] A wide range of education, training and skills at all levels is needed to support the diverse occupations throughout the pulp, paper and converting industries, including chemical, electrical and mechanical engineers, environmental, energy and IT specialists and many others. Most specialist preparation is acquired in universities or technical colleges. With rapidly advancing technology, the areas of vocational training and life-long learning are becoming increasingly important. These issues are addressed in part by the FTP.

Market Structure: Competition

Whilst State aid offers flexibility and growth possibilities to individual firms or consortia, the main tools for restructuring are mergers and acquisitions. Some internationally competitive

[99] Examples are: process innovations to support sustainable development; improving flexibility in the production process; improvements in on-site energy generation – especially from renewables; reducing chemical and energy consumption,

EU–based corporations have been formed from amongst the mergers which the Commission authorised between 1990 and 2005.

Market Structure: Regulation

The recently proposed regulation under the EU FLEGT Action Plan, laying down the obligations of operators who place timber and timber products on the market, is likely to have less impact in the relatively highly concentrated pulp and paper subsectors. However, the downstream consequences for SMEs as regards conversion may be more substantial. Legislation implementing EU climate and energy policies, such as the directive on renewable energy, the new ETS and liberalisation of energy markets, will continue to have a major impact on the European paper industries and their competitiveness.

Environment

Environmental issues, together with energy, are key priorities for the sector. Forest bio-diversity and Natura 2000, sustainable management and illegal logging are major concerns at the beginning of the chain (fresh fibre). This sector (as well as all forest based industries) is likely to be impacted by the RES directive, according to which the Commission is to issue sustainability criteria for Biofuels and Biomass.

The increasing competition for wood as a raw material has to be taken into account, by better matching supply and demand via active sustainable forest management.

Additionally, the following legislation is very important for the pulp and paper manufacturing process:

- The unilateral imposition of a carbon constraint on European industry impacts the sector both directly (cost of allowances) and indirectly (increase in the price of electricity). The Commission is currently determining the energy intensive industry sectors and subsectors that are exposed to a significant risk of carbon leakage. Installations in these sectors and subsectors will be allocated allowances free of charge at the level of the benchmark of the best available technology. Both pulp and paper sectors could be concerned.

- Directive 2008/1/EC on integrated pollution prevention and control covers industrial plants for the production of pulp and paper and cardboard with a production capacity exceeding 20 tonnes per day. These installations must have an IPPC permit to operate, that must stipulate emission limit values based on the best available techniques, for preventing or reducing emissions in the air, water and land, including measures concerning waste. The pulp and paper BREF (best available techniques reference document), currently under review, establishes the best available techniques for the sector.

- This industry is also affected by REACH as a downstream user of chemical products, an importer of chemicals and articles and a producer of substances, such as pulp. The sector is working together towards the joint registration of substances, intermediates and by-products.

- At the end of the paper chain, Directive 2008/98/EC on waste obliges Member States to set up a separate collection for paper and establishes a target to reuse or recycle paper and other materials from households at a minimum of 50% by weight by 2020. This Directive also stipulates that certain waste, under specific conditions, could no longer be considered as waste. Recovered paper might be among the selected waste streams for which criteria

will be developed. Currently, about half of the EU paper production is based on recovered paper. Europe has become a world leader in this field, with the EU's recycling rate well above world average levels. Recovered paper is increasingly being used for environmental reasons, since it is subject to several pieces of EU legislation (i.e. Waste Framework Directive and Directive on Packaging and Packaging Waste) and, moreover, is responsive to enhanced consumer awareness. For many grades of paper there are complementarities between primary or virgin fibre and secondary or recovered fibre, whilst some may be 100% of one or the other, depending on the technical requirements. The Second European Declaration on Paper Recycling 2006-12, which is a voluntary instrument signed by 12 partners from the paper value chain, is a very important instrument in this field. The target is a 66% recycling rate (use of recovered paper plus net trade as a % of paper production) by 2012.

External competitiveness

The EU is a net exporter of paper and articles of paper, with a trade surplus of €11.5 billion in 2008, and it is a net importer of pulp with a trade deficit of €3.5 billion in 2008.

In 2007 the EU accounted for 21.3 % of the world pulp production of 194.2 Mt., but it remains a net importer, mostly from the Americas. 80% of the pulp imported by the EU comes from Brazil, the US, Canada and Chile. The pulp producers in the southern hemisphere are playing an ever-increasing role, due to lower material and labour costs, and this is leading to a situation where the pulp and paper companies, including European ones, are investing in these countries.

For paper, the EU was the world's largest producer in 2007, providing 26 % of the global total of 394 Mt. The main destinations for EU exports of paper and articles of paper are Russia, the US and Switzerland, which account for 12%, 10% and 9.5% respectively of total EU27 exports. Imports from Asia are developing rapidly, and in 2008 China became the third EU supplier for paper and articles of paper, after Switzerland and the US. Imports from China have risen by 76% since 2005.

All tariffs for pulp and paper on European markets have been abolished since 2004. To service the EU's growing need for paper sector exports, it is vital to have good market access. However, some third countries have persistently high tariffs and/or non-tariff barriers, which limit the access of EU pulp and paper to some foreign countries.

Major trade concerns of the EU paper industry include increasing supply costs for raw material from certain sources (notably Russian hardwood further to tariff hikes as from 2006), distortions of competition resulting from subsidies to companies in third countries (e.g. fuel tax credits granted to US paper producers), and access to new markets. EU producers have also expressed interest to extend to new countries and products the WTO sectoral agreement that allowed elimination of pulp and paper duties for a number of members in 2004.

Employment and the geographical dimension

Since 2000, employment in the pulp, paper and paper products industry has steadily declined, by 15 % between 2000 and 2008. Employment in 2008 was 2% lower than in 2007, which is in line with the situation in previous years. Most of those employed in the pulp, paper and paper products industry are medium- and low-skilled workers. High-skilled workers are estimated to represent less than 20% of the employed workforce. Geographical markets for

pulp, paper and converted products are determined by their bulk/price ratio. Thus, even high-value pulps may be shipped globally in large batches. Paper reels may also travel internationally, but cut paper and converted products - especially very bulky packaging and lower value household and sanitary goods - are normally produced and distributed on a regional or even a local basis. Traditionally, paper merchants have handled the matching of production output with the needs of different customers. Whilst this remains the case for many stationery and specialist products, cut forms of commodity papers are increasingly being sold directly from the bigger firms formed by recent mergers.

Areas of growth (within the sector)

Intelligent papers have potentially very wide applications with high added value. Increased management of both primary and secondary fibre supplies and their efficient use, including for energy both within the pulp, paper and converting industries and elsewhere, offer the prospect of diversification.

Response to structural change

Office papers are still continuing to grow, but overall they may peak in the coming years; moreover, some grades are even declining as second-generation IT users have less need to print hard copies of documents. In sanitary papers there will be a slow move away from baby goods to goods for old people as the EU population pyramid becomes top-heavy.

Structure of sector

The pulp manufacturing industry consists for the most part of large and very large firms, often multi-nationals and frequently integrated with paper operations. They are very capital-intensive industries, as a new state-of-the-art pulp mill costs around €1 billion, or even more if it is integrated with a paper mill. Paper mills for "commodity grades" of paper, i.e. those intended for further cutting into sheets or rolls or subsequent conversion into products, are most often also large or very large and also quite capital-intensive, especially if there are several paper machines on one site. Plants producing speciality grades may be smaller. Conversely, most converting mills, i.e. those producing usable paper products, are SMEs. Ranked by the index CR_{10} for degrees of concentration (i.e. market share of the ten biggest suppliers), concentration in the paper-making subsector is as follows: high (> 85%) for coated mechanical paper, uncoated mechanical paper, newsprint and coated wood free paper; medium (65% to 85%) for cardboard, market pulp, and tissue paper; low (< 65%) for uncoated wood free, container board, and wrapping papers.

Sector-related services

Machine design, development and manufacture, together with chemicals for pulping, surfacing and printing, as well as fibre development (including genetic work), are the main physically related sectors. Finance and consultancy also play important roles.

Vulnerability to financial crisis

The financial crisis is spreading negative effects throughout the global pulp and paper industry, including for EU producers. Overall EU and global demand for pulp and for paper goods is likely to fall, with some paper grades, such as packaging or graphics, being hit harder by the downturn in advertising and by the general downturn in output. Slowing GDP growth

and shrinking exports, especially to the US (one of the main markets for EU paper products), plus reduced domestic demand, have put many European mills in a difficult situation, with production cut back and new investments and expansion postponed.

Production in 2008 was 2.5% lower than in 2007, while the figure for turnover was almost the same in 2008 as in 2007; this was a change from the trend in the previous years. The situation in the last months of 2008 clearly shows the decline, with the production of pulp, paper and paper products in the last quarter of 2008 being 8.8% lower than in 2007. New orders in the last quarter of 2008 also decreased substantially and were almost 9% lower than in the last quarter of 2007. As a result, some large EU paper producers have announced that they will continue to curtail production to adjust to weakened demand. Several EU paper groups have also announced a fall in net profit in the fourth quarter of 2008 due to sales slowing down. In the packaging sector, at the end of November 2008 the year-on-year decline for the box business was up at 3.8%. The sanitary and household paper subsector, however, seems to be less affected. In the first quarter of 2009, the production of pulp, paper and paper products decreased further to be 15 % lower when compared to the same period of 2008.

Since pulp and paper is a very capital intensive sector, the global financial crisis is having direct negative consequences on it through the higher cost of capital and reduced access to credit. SMEs, in particular in the EU paper converting subsector, are likely to suffer reduced access to financing for both working capital and investment capital. To some extent, though, the need by all three subsectors for financing may be postponed by increased market uncertainty, which seems set to continue for at least a couple of years. However, the likely effects on investment in innovation, RTD and education can only be negative in the medium-to-long term. Within the EU, the new Member States should continue to show growth, even if the rate of increase is slower than in recent years. Export markets will be more competitive, especially as low-cost producers such as China are increasingly competing for them. In the medium-to-longer term, the pulping subsector will have the potential for energy production and export, especially if it is transformed into bio-refineries capable of switching production between different mixes of products and energy.

27. RAILWAYS – RAILWAY SUPPLY INDUSTRY[100]

Basic facts and figures on the sector

The railway sector should be seen as the sum of three types of actors: infrastructure managers, operators and supply industry. The "railway supply industry" encompasses companies active in the design, manufacture, maintenance and refurbishment of rail transport systems, subsystems and related equipment and components. The main segments of activity of these companies are rolling stock, control-command and signalling, infrastructure and services. Rolling stock covers different segments:

- high speed trains;
- conventional trains;
- urban rolling stock: commuter trains, metros, light rail and trams;
- freight locomotives and wagons.

In terms of products, rolling stock includes locomotives, electric multiple units, diesel multiple units, coaches and wagons, metros, trams and light rail vehicles. Rolling stock subsystems include brakes, doors, bogies, wheels, etc. Control-command and signalling includes trackside and on-board signalling systems as well as control centres. Infrastructure products encompass among others rails, sleepers, points, switches, and electrification systems. Services include maintenance of infrastructure, rolling stock and subsystems and refurbishment. The accessible worldwide market volume for railway equipment (infrastructure, control-command and signalling, rolling stock and maintenance) is around €86 billion per year. The European rail supply industry has an 80% market share in Europe and manufactures more than 50% of the worldwide production of rail equipment and services. Additionally, the European rail supply industry is expected to have an annual growth rate of between 2.0% and 2.5% over the next nine years. Urban rail accounts for a significant share of the production of the European railway industry (20% of the total) and the main manufacturers are almost all the same as those for conventional and high speed rail.

Competitiveness assessment

The railway supply industry is a dynamic sector. European companies are the main players on a world scale and almost cover the needs of the EU internal market. The turnover of the rail supply industry amounts to 0.84% of the value of global European manufacturing. Rail transport is competing with road and air transport. In the field of passenger transport, the rail supply industry is therefore investing heavily in reducing travel times through very high speed connections and upgrading passenger comfort. For freight transport, the rail industry is producing increasingly efficient, powerful and environmentally-friendly locomotives.

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100 The data in this section is derived from the following sources:
- The railway association Unife and data from the study "Worlwide Rail Market Study -status quo and outlook 2016" commissioned by Unife.
- The Interfleet Study commissioned by EC (DG ENTR), "Survey of Competitiveness of the EU Rail Supply Industry" and Eurostat.

Europe, NAFTA and the Asia/Pacific region are the key markets today. Asia/Pacific is set to surpass the other geographic markets and become the second largest accessible market for the industry by 2016.

R&D and innovation

The European rail supply industry is at the forefront of technological innovations in the sector: high speed technologies, mass transit solutions, European Rail Traffic Management System (ERTMS) signalling system, etc., and it provides competitive products. Continuing investment in research has endowed the European rail sector with comfortable, safe and fast trains. Modern technologies contribute to reduce life cycle costs of rolling stock, infrastructure, signalling, maintenance procedures, etc.

The rail supply industry continues to achieve a very good performance compared with other forms of transport, thanks to innovation. The development of a European high-speed network based on new technologies allows passenger trains to run at over 300 km per hour.

Knowledge and skills

The development of the European railway sector will need well managed and collaborative research and targeted, research-led education. Achieving understanding and cooperation between leading system stakeholders, including railway infrastructure managers, operators and specialist suppliers, is fundamental.

Market structure: Competition

The rail supply industry operates in a unique market. There are two types of customers:

- incumbent operators and infrastructure managers who, in most countries, are the main customer of the rail supply industry. Big players can place huge orders and enjoy considerable negotiating capacity (power of demand);

- private operators, which are usually much smaller.

Competition is much stronger on the rail supply industry market. The rail supply industry is composed of big system integrators operating with a high level of competition and many subsystem suppliers. In Europe, the market - governed by European procurement law - is very open.

Market structure: Regulation

In the last 20 years the Commission has been very active in restructuring the European rail transport market and strengthening the position of railways vis-à-vis other transport modes. Commission efforts have concentrated on three major areas, which are all crucial for developing a strong and competitive rail transport industry: (1) opening of the rail transport market to competition, (2) improving the interoperability and safety of national networks and (3) developing rail transport infrastructure.

(1) Greater competition makes for a more efficient and customer-responsive industry. The legislation is based on a distinction between infrastructure managers who run the network and the railway operators that use it for transporting passengers or goods. As well as encouraging

greater competition within national markets, EU legislation gives rail operators the ability to run services in and between other EU countries, opening up competition in a cross-border sense. Rail freight transport has been completely liberalised in the EU since the start of 2007, for both national and international services. This means, in principle that any licensed EU railway company with the necessary safety certification can apply for capacity and offer national and international freight services by rail throughout the EU. The EU will liberalise the market for international rail passenger services from 1 January 2010. Any licensed, certified rail company established in the EU will then, in principle, be able to offer such services. Some obstacles at the level of transposition of the rail legislation by Member States are still being removed. The market for purely national rail passenger services is not yet being opened up to competition, although this could change in the future.

(2) The creation of an integrated European railway area also calls for improved "interoperability" – or technical compatibility - of infrastructure, rolling stock, signaling and other rail systems, as well as less complex procedures for approving rolling stock for use across the European rail network. Over the years, national rail networks have developed different technical specifications for infrastructure. Specific EU legislation exists to promote interoperability and overcome these differences. The European Railway Agency plays a central role in promoting interoperability and harmonizing technical standards, a process in which cooperation between EU Member States and rail stakeholders is essential. EU Member States can exclude urban rail from the scope of the Interoperability Directive.

(3) The construction of the trans-European transport network (TEN-T), based on the interconnection and interoperability of national transport networks, including rail, is very important for the EU's economic competitiveness and its balanced and sustainable development. As part of the EU's TEN-T programme, a number of European Coordinators are tasked with facilitating the implementation of certain multi-country rail projects (six including ERTMS) that are regarded as a high priority for the network. One of the EU's aims for the rail sector is to upgrade a number of important freight routes by 2012–2015 by deploying ERTMS systems along them. The six routes carry around one fifth of Europe's rail freight traffic. The EU is also working towards the creation of a rail network giving priority to freight, including the creation of a number of international freight-oriented "corridors" - at least one in each EU Member State - by 2012.

Environment

The increasing impact of limited fossil fuel availability and resulting rising prices, as well as a rising ecological awareness, are paving the way for growing demand for rail transport. Deregulation and liberalisation, for freight and regional transport, leads to better performance, higher customer satisfaction and an increasing intermodal market share for rail. The rail supply industry is responding with new product development, and by further reducing emissions and improving noise control. Rail networks and hence rail industry products could play a major role as part of a sustainable and environmentally friendly transport system.

External competitiveness

Europeans are pioneers in railways and own the leading edge technology. The European railway industry is the major supplier for the railway market not only in Europe but also at global level, since it is the leader in terms of manufacture of rolling stock, signalling and safety equipment and infrastructure. The Japanese and the American rail supply industries are

the traditional competitors of the European industry. The Japanese, in particular, have also developed high-speed technology. The South Korean and Chinese supply industries are also becoming growing competitors.

Employment and geographical dimension

There are about 1,780 separate firms in the sector in Europe, employing around 225,000 people.

According to the most recent Eurostat data Germany has the highest share in EU-27 employment in the sector (16.7%), followed by Romania (15.9%), Poland (10.1%), France (8.3%) and the United Kingdom (7.4%). In terms of value slightly more than one quarter of the EU-27 total was accounted for by Germany (26.3 %), followed by France, Italy and Spain (each with more than 10 %). In relative terms, this sector accounted for 46.2 % of transport equipment manufacturing value added in Latvia, by far the highest share, and was also relatively important in Slovakia and Romania.[101]

Areas of growth (within the sector)

In terms of market segments for the total market, the rolling stock segment is expected to grow steadily. However, it is the control-command and signalling subsystem and infrastructure which are displaying the highest growth rates.

Response to structural change

The European railway industry needs to confront the challenges of globalisation, rapid technological advance and concerns over climate change and the environment. However, these challenges also present new opportunities for competitive and innovative businesses. One of the key issues for the railway industry is the arrival on the European market of new competitors from outside Europe. Traditionally, the internal market has been served by European companies with hardly any external competition. However, for the past few years, the European industry has faced increased competition from Japanese, South Korean and Chinese suppliers. Nevertheless, European companies are in a position to continue conquering markets all over the world, particularly in the emerging economies. Also, liberalisation in Europe has resulted in a growing number of private operators (particularly freight operators). This development has attracted private investors to buy and lease locomotives and freight wagons and operate freight services. The planned liberalisation of the passenger services may be a challenge for incumbent operators, but should offer good prospects for manufacturers, with the emergence of new operators who will need to buy new trains.

Structure of sector

The industry is characterised by a small number of large suppliers; ten European firms have 32% of the world market. Also, the growing demand for intermodal infrastructure might constitute the potential for dynamic growth for companies supplying related technology and solutions.

Sector-related services

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[101] Source: European business. Facts and figures 2007 edition, Eurostat

The European rail supply industry is capable of producing the most technologically advanced and safest trains in the world, and they are very much in demand by railway companies in many countries. Over short and medium distances the rail transport can compete with other means of transport. In the field of passenger transport, the rail supply industry is therefore investing heavily in reducing travel times through high speed connections and upgrading passenger comfort. Concerning the transport of goods, the gradual introduction of intermodal freight handling equipment has allowed more efficient rail freight traffic. The development of EU wide telematics applications are expected to support a further increase of market shares in passenger and freight railway transport.

Vulnerability to economic crisis

The current economic downturn in Europe is seriously hurting the rail freight industry which reported for January 2009 a decrease of 36 % tonne-km compared to the previous year. Railway operators are responding to the downturn by cutting and postponing investment or even closing temporarily certain line. Although at a lesser extend, rail passenger transport reports a similar situation, which are expected to have a significant negative impact on the rail supply sectors.

28. SHIPBUILDING

Basic facts and figures on the sector

There are around 150 large shipyards in Europe, around 40 of which are active in the global market for large sea-going commercial vessels. Around 120,000[102] people are currently directly employed by shipyards (civil and naval, new building and repair) in the European Union (EU). With a market share of around 15% in volume terms, Europe is still vying (with South Korea) for global leadership in terms of the value of civilian ships produced (€15bn in 2007). European yards are global leaders in the production of passenger and cargo ferries, cruise ships, dredgers and a number of highly specialized smaller vessels. The marine equipment industry has an annual turnover of around €26bn[103] of which over 45% is exported. It provides direct and indirect employment for approximately 300,000 and 450,000 people respectively; and it has a 35% share of the global market. The production ranges from fabrication of steel and other basic materials to the development and supply of engines and propulsion systems, cargo handling systems, general machinery and associated equipment, environmental and safety systems, electronic equipment incorporating sophisticated control systems, advanced telecommunications equipment and IT. European equipment industries are world leaders in propulsion, cargo handling, communication, automation and environmental systems. While a number of European shipyards still have full order books and ships to deliver until 2010/2011, there have been several contract cancellations esp. for cargo ships and new orders contracted in 2008 are 45% to 90% below 2007 levels (depending on the EU Member State). This currently leaves even the still busy European yards struggling for work from 2011. The yards' design, innovation and development departments are increasingly running out of work, as their main contributions occur during the very early phases after contract conclusion) onwards.

Competitiveness assessment

EU yards have stopped producing low-value vessels such as oil tankers. They maintain a strong position in passenger ships (world leader) and specialised tonnage. In shipbuilding, the level of sub-contracting can be as high as 80% in value terms. Shipbuilding (which used to be seen as a subsidised 'sunset' industry) is now widely recognised as part of a modern and efficient European manufacturing sector that is driving growth in transport, trade, tourism and other areas. Nevertheless, the market environment for Europe's world class shipyards is likely to become more demanding in the years ahead, although the Commission believes that the sector can face the future with relative confidence.

Strengths

- innovative products;
- serving market niches;
- strong cooperation within the supply chain

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102 Source: CESA annual report 2007/8; figure for 2007.

103 Including naval technology; this figure will be further refined in 2010 when Nace 2.0 figures will become available and allow for better separation from other mechanical equipment.

- strong historical industry tradition and thus a robust and solid knowledge base in Europe

Weaknesses

- lack of pre-financing guarantees for yards could endanger ship projects;
- European yards are smaller and more fragmented than Asian competitors;
- difficulties both in retaining the existing workforce and in recruiting new personnel
- long production cycles (up to several years) with exposure to volatile raw material markets (esp. steel);
- intellectual property is not sufficiently protected;

Opportunities

- new regulations favour the introduction of new technology;
- offshore (esp. energy) market is growing;
- growing demand through short sea shipping in Europe;

Threats

- shipbuilding is a highly cyclical business;
- lack of financing available to ship operators could lead to ship order cancellations / avoidance of new ship contracts;
- lack of international level playing field (alleged extensive State aids and interventions in Asia);
- potential market oversupply (a large number of new yards in Asia);
- market downturn (maritime transport is directly linked to global trade and economy).

R&D and innovation

Improving Research, Development and Innovation is a key pillar of the LeaderSHIP 2015 initiative and the Waterborne Technical Platform. Europe's competitive advantage has been and will continue to be based upon its ability to construct the most advanced vessels. In fact, Europe accounts for almost all ship innovations made possible by the successful and continued development and application of innovation and research. That is why the Seventh Framework Programme is important for the sector. In addition, the shipbuilding State aid framework – prolonged in 2008 until the end of 2011 - includes specific provisions on innovation aid that are tailored to meet the unique needs of shipyards - in particular the fact that ships tend to be produced in small series, that research and innovation are often embedded in the construction stages of the ships and that unlike other industries, prototypes are generally sold on the market. The high-tech nature of the shipbuilding industry is further

underlined by the fact that yards, on average, invest more than 10% of their turnover on research, development and innovation.

Knowledge and skills

In Europe's technologically advanced shipbuilding industry, a highly-skilled workforce is a key factor in turning knowledge into wealth and ensuring productivity, innovation and competitiveness. Yards need to recruit, retain and retrain quality workers in order to maintain their skills base and know-how and secure their long-term success. However, the sector still has an image problem, as shipbuilding is too often misleadingly portrayed as an old industry. Hence, young graduates and highly skilled workers have long been unaware of opportunities in shipbuilding. The issue of protection of Intellectual Property (IP) is important, as the future of the European shipbuilding industry hinges on its technological lead. Yards and marine equipment manufacturers can and must do more to protect their IP. Another problem is the enforcement of IP rights. As shipbuilding and shipping are truly global, more needs to be done to facilitate the detection of IPR infringements.

Market Structure: Competition

The huge demand (partially on a speculative basis) for all types of new ships between 2003 and early 2008 has led to the built-up of huge additional shipbuilding capacities, especially in Asia (China, Korea, Vietnam). Initial estimates assume that existing and planned shipbuilding capacities could exceed global demand by 30-50%, based on a "normal" (i.e. post financial crisis) market scenario. This might lead to competition for new contracts based on price rather than quality of the products (2.5 to 4 years can elapse between signature of the contract and delivery of large sophisticated ships). Compared to its main competitors in Japan and Korea, the European shipbuilding industry is more diversified, has more small and medium sized yards; however, its process of consolidation and restructuring is not yet completed, which would make European yards more vulnerable to ruinous competition based on prices.

Market Structure: Regulation

The Commission has neither a mandate nor the vocation to define the structure of Europe's shipbuilding industry. This is up to the market and the forces and principles that rule it. However, from a competitiveness perspective the fragmentation of the European shipbuilding industry is less than optimal. Strong European shipbuilding groups with the requisite financial and technological capabilities will be better equipped to compete successfully in the increasingly competitive world market. LeaderSHIP 2015 has facilitated some convergence of national policies towards the shipbuilding industry by providing a benchmark framework for the competitiveness of the sector. In the EU, shipbuilding is regulated through EU competition law, and national shipbuilding policies have practically ceased to exist. There is no specific EC legislation for the building of large commercial ships, as shipping and shipbuilding are traditionally regulated globally at the level of the International Maritime Organisation (IMO).

Environment

Shipbuilding is considered a comparatively clean industry, and maritime freight transport is the cleanest mode in terms of tonnes/km. Nevertheless, given the total number of global ship movements and the increasing dependency of global trade on shipping goods, emissions by ships have attracted attention in the context of general emission reductions. Furthermore, the

increase in the number of operational ships requires higher safety standards in order to avoid environmentally hazardous incidents and accidents. Shipbuilders and maritime equipment suppliers are part of the solution to the challenge of reducing emissions from ships.

External competitiveness

European shipbuilders hold around 15% of the world market in terms of volume (CGT), but nearly 30% in terms of turnover. EU shipbuilders are technology leaders in many fields, but they are struggling to take advantage of this as global competition is mainly about prices. The EU marine equipment industry is the world leader, followed some distance behind by Japan. Korea and China are making great efforts to gain a foothold in the equipment sector, which provides most of the value added in shipbuilding. It is worth noting that ships are never physically imported (no cross border control for trade in ships), which makes the enforcement of patents very difficult. European yards are world leaders in the export of military vessels and dominate the markets for conventional submarines and fast attack vessels. As shipbuilding contracts are almost entirely priced in USD, EU shipbuilders often see a strong Euro as a handicap. Historically, the industry has suffered from the absence of global rules and a tendency towards (state-supported) over-investment, due to the fact that shipyards offer a wide range of technologies, employ a significant number of workers and generate foreign currency income. Shipbuilding is, therefore, an attractive industry for developing nations. Japan used shipbuilding in the 1950's and 1960's to rebuild its industrial base, Korea made shipbuilding a strategic industry in the 1970's and China is now in the process of repeating these models. As a result, the world shipbuilding market suffers from low profit margins, trade distortions and widespread subsidisation generally. Therefore, after a first attempt in 1994 failed to deliver results, the major players decided in October 2002 to launch a new round of negotiations within the OECD framework to address both unfair pricing practices and subsidisation, in order to restore normal competitive conditions in the worldwide shipbuilding market. These negotiations were paused in 2005 and have yet to resume.

Employment and geographical dimension

From a country perspective, the building and repairing of ships and boats sector is quite unevenly distributed across the EU-27. Shipyards are practically absent in the five landlocked Member States of Czech Republic, Luxembourg, Hungary, Austria and Slovakia, and have more or less disappeared in the UK, Ireland, Sweden and Belgium. Nevertheless, some of these States (esp. UK as one of the largest European marine equipment producing countries) are very active in exporting goods and services to shipyards around the globe. In economic terms, the sector plays a very important role in countries such as Malta, Lithuania, Romania, Greece, Estonia and Latvia, where more than 1.5% of the total manufacturing value added is generated by the analysed sector. Interestingly also, the sector seems to be of relative importance in countries such as Finland, The Netherlands, Bulgaria and Poland, with percentages ranging from 1.4% to 1.1%. Meanwhile, in countries such as Italy, France, United Kingdom and Spain, the sector represents between 0.7% and 0.9% of the value added generated by the national manufacturing sectors, whereas in Germany this percentage is only 0.4%.

90% of the employment in EU shipyards (new constructions) has been lost in the last 30 years (the corresponding figure for new building and ship repair combined is 75%), although actual shipbuilding output has increased. This is a sign of the dramatic productivity increases achieved. A European social dialogue was set up in 2003 enabling the social partners to address major challenges such as economic and social management of restructuring,

vocational training and the improvement of the sector's image to attract qualified younger workers.

Areas of growth (within the sector)

The European shipbuilding industry is the global leader in the construction of complex vessels, such as cruise ships, ferries, off-shore structures, mega-yachts and dredgers. It also has a strong position in the building of submarines and other naval vessels. The European marine equipment industry is the leader in technology for the worldwide shipbuilding sector. Companies in the European sector have introduced the majority of new innovations in shipbuilding and are world leaders for a wide range of products, from large diesel engines to electronics, and the value of the fitting out (products, services and systems) on board a vessel can be as high as 70%. Further opportunities for European industry are provided by responding to the increasing environmental (emissions, energy efficiency) and safety requirements on ship designs and marine technology. Another area of growth is the increased need for vessels for intra-European Short Sea Shipping.

Response to structural change

Highly innovative ships, custom made ships, prototypes, outsourcing of components: these developments show how European shipyards are playing to their strengths and adapting to structural change by concentrating on the niches of ship types, such as cruise ships, which can only be built with the European infrastructure of thousands of suppliers and subcontractors (many of them SMEs). In these markets, European yards are world leaders and are endeavouring to maintain this position by continuing to invest intensively in research, development and innovation. Yards also maintain high standards in quality and reliability of delivery times, and are continuing to improve efficiency and protect their intellectual property against drainage and theft.

Structure of sector

Ships are produced by shipyards mainly above SME size (up to several thousand employees). Marine equipment suppliers are mainly SMEs (specialised in marine equipment) and some larger companies which also deliver products for other sectors (e.g. engine manufacturers).

Sector-related services

A range of maritime services is linked to shipbuilding (shipping, inland navigation, seaports services, offshore supply, recreational boating, research and development, education, classification and inspection, bunkering, maritime works, maritime insurance, maritime financing, maritime brokerage, maritime law, crewing, associations, government services, rescue, diving, ship supply). According to a 2008 Commission study on maritime clusters, these services account for a direct production value of around €267 billion annually. In the wider sense they also include maritime works/dredging/construction, port services, fisheries, marine tourism and exploitation of marine resources)

Vulnerability to financial crisis

According to industry, shipbuilding is today "facing its deepest ever slump". New orders for ships have almost completely dried up since the last quarter of 2008. Several yards face an acute shortage of work and even in well placed companies, certain functions like project

departments, are now running out of work and starting to downsize. This is potentially very damaging as the competitive advantage of European yards depends on their innovative edge and once the key people and their knowledge is lost, irreparable damage could be suffered. Moreover shipyards are highly dependent on external financing. There is a strong risk of shipyard closures.

The problems facing the shipbuilding sector are also compounded by the massive global overcapacity existing as a result of additional capacity build up in Asia during the last 10 years. Current order books (new ships contracted before the crisis) will increase the global fleet by another two thirds (bulkers) and half (containerships) respectively, while currently more than 10% of the existing global fleet is laid up due to the effects of the crisis. Asian yards are most heavily affected as they are specialised in these ship types; there are reports on substantial state support (China, South Korea) to avoid the closure of shipyards in Asia. Furthermore there are reports on Asian yards trying to enter the niche markets occupied by European yards by offering ships at prices that seem not even to cover material costs.

29. SPACE[104]

Basic facts and figures on the sector

Satellite information provides critical information for the environment, weather forecasts, defence forces and synchronising of financial markets. Many governments have therefore invested heavily in space technologies and space systems. European space segment suppliers had a turnover of €5.3bn in 2007, with a workforce of 29,000 (Eurospace). They are distributed across Europe, influenced by ESA's "Industrial return" rule and national procurement policies. Four large industrial holdings are directly responsible for more than 70% of employment. This niche strategic sector is embedded in the wider European aerospace and defence industry, and highly concentrated, with few SMEs but many small space units within large firms. Two thirds of the European space segment turnover comes from institutional customers, while the proportion is around 85% in the US, where not only is industry less dependent on the commercial market but budgets for space are five times larger and technological developments therefore more numerous. Europe's high technology-based space industry supplies a significant part of the world's commercial requirements for satellite manufacture, launch and services. Business cycles and market developments drive this commercial market. In the early 90s, the generalisation of broadcast by satellite brought a growth cycle which turned down in 2000, although recovery is now on the way.

Competitiveness assessment

The European space industry has maintained its competitiveness, achieving 40% of the international commercial market, despite adverse exchange rate movements. Emerging space powers such as China or India are now becoming significant competitors. This commercial market is substantial and growing: space has given rise to numerous and ubiquitous products and services, particularly in the telecommunications and broadcasting industries. Space thereby created a substantial value chain in derived services, but also produced socio-economic and indirect benefits. The adoption of the European Space Policy Communication[105] and its endorsement by the Space Council on 25 May 2007 gave Europe its first space policy, which will help maintain competitiveness and develop derived services. In the future, space will become even more important and will offer new opportunities for business and services for citizens. Improved positioning or timing systems and global environmental monitoring will provide areas for innovative companies to flourish by providing new services.

R&D and innovation

The space sector is highly dependent on technology. Space technology cycles are longer than the average high-tech cycles. From concept validation to actual implementation and qualification in orbit it may take up to 10 years. This involves very high technological and financial risks that the private sector cannot bear. The technological evolution is driven by institutional programmes based on public sector needs (defence and science) or anticipated

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104 There is no space sector Eurostat data. Therefore, the figures come from the Industry association, EUROSPACE. Other sources might provide different figures since there is a huge discrepancy between the few sources.

105 COM(2007) 212 final, Brussels, 26.4.2007.

commercial requirements. Research and development activities on space technologies are funded mainly through national specific programmes and ESA programmes, on a roughly equal basis. In total, almost €380 million are invested yearly by ESA Member States in space technology R&D programmes, corresponding to 6% of the total European investment in civil space applications. Telecommunications is the area where Europe spends the most of its R&D budget (34%), followed by Earth Observation (12%), Space Transportation (10%), Science & Exploration (9%) and Navigation; 20% of the budget is spent on horizontal R&D activities that are applicable across a number of technology domains.

Knowledge and skills

The major technological and scientific breakthroughs achieved in the space industry make a significant contribution to the European economy's competitiveness as a whole, support the creation of a highly-skilled workforce and generate many highly innovative small and medium-sized businesses, particularly in the space services sector.

Market Structure: Competition

Space programmes have always been driven by strategic considerations. The European space industry was created to respond to institutional needs and is now a substantial economic sector, distributed across Europe, influenced by ESA's "Industrial return" rule and national procurement policies. This strategic niche sector is embedded in the wider European aerospace and defence industry and is highly concentrated, with few SMEs but many small space units within large firms. Two thirds of the European space segment turnover comes from institutional customers, while it is around 85% in the US, where industry is not only less dependent on the commercial market but budgets for space are five times larger. The European Space industry is therefore far more dependent on the highly cyclical commercial market than are its counterparts. This cyclical pattern is amplified in the launcher market.

Market Structure: Regulation

In June 2007 the European Commission issued mandate M/415 to the Comité Européen de Normalisation (CEN) [RD01], Comité Européen de Normalisation Electrique (CENELEC) and the European Telecommunications Standards Institute (ETSI) and the European Standards Organizations (ESOs) to develop a feasibility study and a work programme in the field of space industry standards. It states that the standardization programme is an element of the European Space Programme, aimed at:

- Ensuring an adequate safety level for space hardware and services;
- Fostering European Union projects such as the Galileo satellite navigation system, Global Monitoring for Environment and Security (GMES) and projects in the satellite telecommunications field;
- Stimulating the emergence of European end-user terminals;
- Mitigating space-related threats such as debris;
- Supporting the international competitiveness of the European space industry.

Environment

The space industry is affected by other policy initiatives and EU regulations, for example the implementation of REACH, legislation on chemicals, environmental legislation, etc. Space capabilities are important tools in addressing the global environmental challenges by making use of their global monitoring capabilities. The GMES initiative on global monitoring for environment and security is already providing the first environmental services and its aim is to provide a global tool to monitor environmental trends.

External competitiveness

The space institutional market is vital to the space industry as it provides a large and stable source of revenue and defrays development costs. However, it is often a captive market to the domestic industry, i.e. strong competition from foreign suppliers may be prevented. The international commercial market represents 40% of the European satellite and launcher manufacturers' turnover and is necessary in order to reach a critical mass and be able to maintain a minimum of employment and specialised know-how. This commercial market is highly cyclical, and this feature represents a strong constraint, because the industry has to maintain manufacturing capabilities even in down periods. Market shares show that European companies are very competitive, having managed to acquire around 40% of the international commercial market. For the moment, the US industry seems to be focusing on its institutional market. However, this is not the case for emerging space powers, such as China or India, which are gradually entering the market.

Employment and geographical dimension

The European space manufacturing industry is a niche strategic sector, employing about 30 000 people in Europe for a turnover of €5.3 billion in 2007. It is embedded in the wider European AeroSpace and Defence industrial complex.

Areas of growth (within the sector)

Space business cycles and market developments have affected space industry revenues in different ways in recent years. Commercial markets (including sales to Arianespace) show the highly variable profile of commercial business in space. To date, the commercial satellite market has evolved through three demand cycles, each corresponding to a new generation of spacecraft technology with improved performances. Since the early 1970s:

- the average bandwidth available on a satellite has almost doubled;
- the operational lifetime of communications satellites has now doubled to 15 years;
- the launch mass of commercial communications satellites has quintupled to about 4,000kg.

In the early 90s, satellite communications entered a new era with the generalised spread of DTH broadcast by satellite. The GEO commercial market showed significant growth until 2000. After the market downturn of 2000 and the restructuring of satellite operators, expectations on the commercial market were revised. Institutional markets, in contrast, exhibit a fairly stable profile and do not compensate for commercial market variations. Between 1985 and 1995, European institutional budgets grew on average by 10% a year. After 1995, they remained stable (in current terms). Defence customers have been the only factor of institutional business growth.

Response to structural change

The situation of the European space manufacturing industry has changed significantly in the past decade. Mergers and acquisitions have restructured the manufacturing sector, starting at the higher level of the value chain (system integrators) pursuing strategies of vertical and horizontal integration. Industry restructuring explains some of the reduction in employment suffered by the sector since the mid nineties, but market factors also apply. Indeed, with the take up of commercial and defence businesses, employment began to grow again in 2006 and 2007.

Structure of sector

Four large industrial holdings are directly responsible for more than 70% of total space industry employment. SMEs represent significantly less than 5% of total space industry manufacturing employment, whereas small space units (within larger companies) represent around 20% of the total.

Sector-related services

Space has given rise to numerous and ubiquitous products and services, particularly in the telecommunications and broadcasting industries. The commercial space market has reached different levels of maturity in the various sectors: satellite communications, Earth observation and satellite navigation. Globally, total revenues were over €120 billion in 2005 (ESA study - figures vary considerably):

- The largest segment of the industry is value-added services, with revenues of €73bn in 2005. The North American market accounts for €35bn, Europe €21bn, Asia €11bn and the rest of the world €5.4bn.

- The user ground equipment and terminals industry has a turnover of about €37bn.

- Satellite operators, essentially in satellite communications, have €7.5bn of turnover.

- The space segment industry, encompassing satellite manufacturing and launch service providers has a global turnover of about €4.2bn on the commercial market.

Vulnerability to financial crisis

- Two thirds of the space industry's turnover comes from institutional customers, and sustained pressure on the public budget could therefore have a long-term effect on relevant demand, whereas short-term effects might be limited.

- The space commercial market is typically cyclical, with the industry having to maintain manufacturing capabilities even in down periods. In addition, competitiveness on a global scale depends very much on technological development, which is in turn driven mainly by institutional programmes (see above). However, the short-term influence of the financial crisis is likely to be limited, given the cash-flow of operators and also current sustained level of multi-media expenditure by consumers.

- Most space SMEs are subsidiaries of industry holdings, and thus any short-term financing difficulties they face should be limited.

30. STEEL[106]

Basic facts and figures on the sector[107]

Steel is one of the main inputs for many industries producing investment goods (mechanical engineering, transport, construction, etc.). Production of steel therefore represents the first upstream step in the manufacturing value added chain. To produce steel, the EU imports raw materials such as coal and iron ore, but steel is also 100% recyclable and is actually recycled to a large extent in the EU. It therefore contributes extensively to the sustainability of our society. With a production of 198 million tonnes, the EU-27 accounted for 15 % of world steel production in 2008. Turnover in the EU steel sector is approximately €150 billion and the sector employs around 440 000 people. The average productivity level of the EU is estimated at 566 tonnes per person/year. The EU is the world's second biggest steel producer after China. About 60% of steel in the EU is produced from iron ore and 40% is produced from steel scrap. The EU steel market is mature, and the EU steel industry is highly competitive, thanks to its modern technology and capacity for innovation. The steel production process is very energy- and capital-intensive. During the last five years, a spectacular change has taken place in the overall landscape for steel, with the rapid emergence of new players on the world market, like Brazil, Russia, India and China (BRICs). The growth of emerging economies pushed up demand for and prices of steel and related raw materials. Prices reached peak levels before mid-2008 and started to decline in the second half of the year as a consequence of the economic crisis. The BRIC economies have become big producers of steel, with China currently being the biggest producer with a 38% share of world production. The recent downturn in the economy and the financial crisis are having an impact on the sector at world level; demand and prices are declining.

Competitiveness assessment

The challenges for the EU steel industry are linked to the cost and availability of inputs (raw materials, energy, and labour) and to competition from third country producers operating under a different legislative framework. A very large part of the iron ore, coal, and energy needed is imported, while ferrous scrap is sourced mainly within the EU. The iron ore market is dominated by three producers controlling 75% of world trade. The entry of China on to the demand side of the market has pushed input prices to record levels. Between 2003 and the first half of 2008, iron ore prices went up by a factor of 4.5. A sharp decline in iron ore and scrap prices due to weak demand was seen in the second half of 2008. The strengths of EU competitiveness are based on the high quality and added value afforded by the integration, organisation and efficiency of production, skilled manpower, and innovation.

The *strengths* of the EU steel industry are:

- EU steel production is technology intensive and highly innovative. Only 30% of the steel products on the market today existed ten years ago.

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106 NACE 27.1

107 Data source: own calculations based on Eurostat data; Economic and Steel Market outlook 2009-2010 (Eurofer 2009); CRU Monitor (www.crumonitor.com); Study on the Competitiveness of European Steel Sector (Ecorys 2008).

- The industry has a strong position on domestic markets and particularly in high value added products.

- Strong technological links have been established with the main client sectors, such as the automotive, aerospace and high performance engineering industries, to develop tailor-made products.

- It has highly skilled manpower and a competitive edge in terms of productivity, organisation, logistic and services.

The *weaknesses* of the EU steel industry are:

- Heavy dependence on imported raw materials and energy, making it highly sensitive to fluctuations in raw materials and transport prices and to measures applied by third country suppliers.

- The steel production process is energy- and capital-intensive.

- Compliance with environmental legislation represents a growing proportion of production costs. Moreover, compliance might pose problems because the production process is at a mature stage, and there is only limited potential for improving energy efficiency in the short term while no major breakthrough technology can be expected in the near future.

Opportunities for the steel industry include:

- Reinforcing the capacity to innovate and manage the sustainability of the sector, in particular with respect to the ambitious EU objectives on climate change.

- More efficient use of raw materials which offers the potential for dealing with the consequences of rising raw materials prices.

- Investment in clean technologies, improved energy efficiency, reduced emissions and energy costs.

Threats to the steel industry include:

- The challenges of EU steel industry are linked to dependency on imported raw materials such as iron ore and coal and to the competition from third country producers.

- EU steel producers increasingly have to compete with new players on the world market (namely China, Brazil, India and the CIS countries).

- High energy costs, especially electricity costs resulting from incomplete liberalisation of European energy markets and from climate change legislation.

- Increasingly strict regulation concerning energy use, CO_2 emissions, pollution prevention and control, and waste are the major challenge that the industry has to face.

- Trade in steel raw materials (ores and scrap) is being increasingly affected by national measures in third countries aimed at limiting the export of such materials.

- Recruiting sufficient numbers of qualified employees is becoming increasingly difficult due to the declining overall workforce, increasing competition for skilled workers and a decreasing number of young people applying for technical education.

R&D and innovation

The EU has a specific, focused strategy in this field, supporting steel research with a unique, three-fold set of complementary research instruments: the Framework Programmes (FP), the Research Fund for Coal and Steel (RFCS) programme, and the Steel Technology Platform (ESTEP). The Framework Programmes and RFCS are financial instruments established to promote research in the steel sector. While the FP focuses on basic research, the aim of the RFCS is to support pre-competitive, co-operative and applied research as well as pilot projects, thereby creating a link between research, innovation and industrial application. The main pillar of the RFCS is a network of researchers and production engineers engaged in innovation projects for both steel producers and users. Consequently, an effective exchange of information and a rapid transfer of technology from the research stage towards its industrial implementation have been made possible. The Steel Technology Platform (ESTEP) brings together the whole European steel industry, research centres, universities, the European Commission and Member States, as well as the other European institutions and trade unions, with the objective of defining visions and responses to the strategic challenges up to 2030. Amongst the proposed topics included in the Strategic Research Agenda of the ESTEP is the ULCOS (Ultra Low CO_2 Steel) programme, the objective of which is to develop innovative technologies for the reduction of greenhouse gas emissions by 50% in the medium-to-long term. Today, CO_2 emissions per tonne of steel have almost reached the theoretical limit for the existing technologies, and fundamental innovation is required in order to meet the ULCOS objective

Knowledge and skills

The skills of the European labour force are among the current competitive advantages of this sector in relation to its competitors. The skills challenge for the European steel industry is related to structural change and the development in technology that the sector is facing. There is a need to develop new competencies and continuous training, particularly in the areas of new engineering fields and managerial skills. There will be a demographic problem in the future, as many people working in the steel sector will be retiring in the next ten years. The same applies to the situation in science and technical universities related to the sector. In the future this may affect the capacity to innovate, which is one of the main strengths of the European steel industry.

Market structure: Competition

The steel sector is subject to specific, more restrictive State aid legislation, than that generally applied to other industrial sectors. Currently, no operational or restructuring State aid is allowed except for closing down a plant in EU25. The industry in EU15 completed its restructuring in the 1990s. In the new Member States which joined the EU in 2004, restructuring was completed in 2006 and they have had to comply with EU state aid rules since then. Bulgaria and Romania will finish their transitional period by the end of 2008. During the restructuring phase, the productivity of the steel companies in the new MS has improved considerably.

Market structure: Regulation

The steel sector is concerned by specific regulations only in the field of State aid (see § on Competition). The main horizontal legislation is environmental (e.g. IPPC directive, REACH, ETS, Thematic Strategies) and in the area of health and safety.

Environment

The following pieces of environmental legislation affect the steel industry specifically:

- Directive 94/62/EC on packaging and packaging waste,
- Directive 2006/12/EC on waste.
- Directive 2008/98/EC on waste and repealing certain directives
- Directive 2008/1/EC on integrated pollution prevention and control (IPPC),
- Directive 2002/95/EC on the restriction of certain hazardous substances in electrical and electronic equipment,
- Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community,
- Regulation 1907/2006 concerning the Registration, Evaluation, Authorisation, and restriction of Chemicals (REACH).

The issues related to the environment are as follows.

i) Under EU legislation, steel scrap is classified as waste and its management and shipment are regulated within the framework of EU waste legislation; similar considerations apply to certain by-products (e.g. slag) from the steel industry. The future recycling of scrap metal and slag will be facilitated by new provisions in the Waste Framework Directive (adopted on 19 November 2008) which, among other things, includes definitions of by-products and end-of-waste status and will allow the identification of appropriate end-of-waste criteria. The Directive will also require Member States to meet collection targets for the re-use and recycling of metals, paper, glass and non-hazardous construction and demolition waste.

ii) The steel industry is a major industrial emitter of CO_2 in the EU. In assessing the impact of the EU ETS on the sector's competitiveness, it is necessary to distinguish between two different processes of steel making: basic oxygen furnace (BOF) in integrated mills producing from iron ore, and Electric Arc Furnace (EAF) producing from steel scrap. The integrated route emits five times more CO_2 per tonne of steel than the EAF route. Most of the emissions in EAF are indirect emissions resulting from electricity consumption, because the EAF process uses a substantial amount of electricity. In BOF only 10% of emissions are indirect. As fossil fuels and energy represent significant costs in steelmaking, the EU steel industry has always worked hard to reduce its energy consumption. In January 2008, the Commission adopted a proposal for the ETS to be reviewed as part of a climate action and renewable energy package with the aim of strengthening the single, EU-wide carbon market after 2012. The final compromise on the energy and climate change package, including the ETS review, was reached in the European Council and the European Parliament in December 2008. The

final text includes specific criteria for identifying the sectors that are potentially at risk of carbon leakage. Based on these criteria, an evaluation covering all energy intensive sectors will be carried out by the Commission in the course of 2009. Moreover, industry and the Commission are currently exploring the possibility of industry world-wide reaching a sectoral agreement in the area of CO_2 emissions at world level, which might provide a level playing field in order to avoid the risks of carbon leakage.

iii) The specific characteristics of metals and the need to differentiate alloys as special preparations have been recognised under REACH. Industry will, in close cooperation with the authorities, develop recommendations and guidance to fulfil the requirements related to alloys under REACH.

iv) The industry is covered by the IPPC. This Directive is now under a recast procedure which proposes to simplify existing legislation on industrial emissions while strengthening the role of BAT. It follows the co-decision process (EP 1st reading opinion in March 2009). BREFs (Best Available Techniques Reference Documents) for steel and for the ferrous metal processing are currently under review.

External competitiveness

The European Union is the world's second biggest steel producer (15%) after China, which is by far the world's largest producer (38%) and way ahead of Japan and the US. The EU steel market is the most open in the world, and from 2004 all tariffs were fully abolished following the 'zero for zero' agreement for steel under the Uruguay Round. As a consequence of the high level of prices in 2006 and 2007, the EU market became and still remains an attractive market for steel-producing third countries. Consequently, the EU moved from the position of net exporter to one of net importer, with 5.3 million tonnes of net imports in 2006, 14.8 million tonnes in 2007 and an estimated 5.3 million tonnes in 2008. Consequently, the main external challenges are trade distorting measures applied by third countries. The difficulty of access to third markets is due to tariff and non-tariff barriers, and protectionist legislation (for example, export duties for scrap from Russia and Ukraine, and for coke from China). In the context of globalisation, which intensifies trade between the regions, some competitors in third countries receive government support. Faced with such a situation, the EU has employed trade remedies to combat injurious unfair trade practices. The number of measures has decreased in the past years. Most recently, anti-dumping investigations have been launched for tubes, galvanised sheets and stainless steel flat products.

Employment and geographical dimension

Integrated steel production facilities were initially located near to the EU iron ore and coal mines, the traditional production clusters being the Saar (DE), the Ruhr (DE), Lorraine (FR), the Midlands (UK), Wallonia (BE) and Silesia (PL, CZ). Starting in the 1970s, due to the development of cheaper iron ore and coal production in developing countries, and the low overseas transport cost, local raw materials rapidly became uncompetitive and gradually mines were closed. As a result, new steel plants were located along the coast and near to harbours to handle imported raw materials and energy. Today, non-coastal steel facilities have to contend with additional costs, which have a negative impact on their competitiveness. Mini-mills (plants producing from scrap) are located near to industrial basins where scrap is generated and where the client industry is located. Mini-mills produce 35% of the EU steel output. The share of the new Member States in the total EU-27 output is approximately 16 %.

Growth areas

Demand in some new Member States, in particular the demand for high quality products, is expected to grow in the long term. The most interesting prospects concern new products for applications in construction, transport and the energy sector.

Response to structural change

In order to maintain its market position, the steel industry needs to exploit its strengths and focus on what is currently its competitive advantage, such as R&D and advanced development of high-quality products. Moreover, the sector needs to continue to build strong strategic relationships with clients in relation to product development. With present technologies, and at least in the short term, the possibility for further improvements in energy efficiency is limited, and the industry must therefore intensify its efforts to develop cleaner technologies and meet the objectives related to climate change. Since the sector is facing increasing competition from non-EU countries, it is necessary to strive for an international level playing field and to remove the existing barriers to access to third markets or to raw materials.

Structure of the sector

There has recently been an increase in consolidation activity, partly driven by the need to balance the market power of the more concentrated upstream industry (iron ore) and downstream clients (highly concentrated in certain markets, e.g. the automotive sector). Barriers to entry are very high, as steel production is very capital intensive, the minimum economic scale is high and very large investments are involved. For this reason, SMEs are very rare in the steel production sector. SMEs are predominant, however, in the first processing sector (metals casting). The top five European companies make 59% of all steel produced in the EU. By comparison, ten years ago, the top five companies produced only 37% of total EU output.

Sector-related services

As with many other industries, the European steel industry outsources some services to external firms, for example in the fields of maintenance, laboratories, or ICT.

ICT endowment, e-business use and outsourcing of related services are advanced in the EU steel industry. The larger companies in particular have adopted ICT, among other things in order to manage the supply chain and for process innovations.

Vulnerability to financial crisis

- The steel sector is highly dependent on demand from a few main consumer sectors. Construction and structural steelworks are the biggest consumers, with a share of approximately 38 %, followed by automotive (16%), and mechanical engineering (14%). The steel-using sectors that are affected most directly by lower or delayed spending are the construction sector and, more particularly, the automotive industry, as well as industries that are active in their supply chain, such as suppliers of equipment and parts and components. Taking into account the above, steel production can be regarded as highly sensitive to the economic cycle and to the decline in investment and consumer purchases.

- The main effects of the financial crisis on the steel companies in the EU are higher costs of capital, reduced access to credit, lower domestic demand and weaker international trade growth. Among the major steel producers this situation has led to blast furnaces being temporarily closed across Europe, and workers being laid off. The fall in steel demand and production is also affecting other regions of the world.

- In 2008 the EU-27 produced around 198 million tonnes of crude steel, a figure which was down by about -4 % compared to 2007. The decline in production accelerated in the last quarter of the year, with production falling by 26%. All major steel producing countries, including Germany, Italy and France, experienced a reduction in output. EU exports to third countries (in volume) also declined by around 18% in the last quarter of 2008.

- The market outlook for the EU is for further production cuts and a significant reduction in capacity utilisation. In the first quarter of 2009, the production of crude steel in the EU-27 fell by 43.8 % compared to the first quarter of 2008 and nearly one third of the overall EU steel industry employment is estimated to have been affected by lay-offs or short-term working arrangements.

- A sharp fall in steel prices was observed in the second half of 2008. Prices of flat products (hot rolled coils) fell by more than 40% and prices of long products by 50%. Moreover, the crisis is also affecting raw materials markets (iron ore, coke, nickel and scrap) where a decline in prices has been observed. The price of ferrous scrap fell by 60-70% during this period, alleviating the pressure on the margins of long product producers that use scrap as an input material.

- The sector is facing increasing competition from emerging countries. Weakening of the demand for steel on the world market is leading international exporters to look more actively for potential outlets outside their home market, in many cases benefiting from government support or protectionist measures, which consequently ratchets up competitive pressures on the EU market. As an example, imports from China more than doubled in the third quarter of 2008, after a reduction in imports in the first half of 2008.

- In recent years, companies in the new Member States underwent a restructuring process encouraged by the Commission. It can be assumed that, without such timely restructuring, these companies would have been in a worse position to fight the current crisis.

- Many of the companies in the first steel processing sector and in some customer sectors (e.g. construction) are SMEs. Steel companies will be affected if the players in the downstream value chain (processing, distribution and end-users) face mounting financial problems due to the credit crunch.

- Owing to the high energy intensity of steel production and high energy costs, the sector is highly vulnerable to the volatility of energy prices.

- The high emission intensity of production plus the fact that the potential for improvement using the existing technologies is limited mean that more stringent ETS legislation will mean additional costs, unless provisions are put in place effectively and in time in order to prevent carbon leakage and avoid the uncertainty that is contributing to the negative impact of the crisis. It is also important to continue promoting public investments in research programmes, such as ULCOS, under the European Steel Technology Platform, whose

objective is to develop breakthrough technologies to massively reduce CO_2 emissions in steelmaking.

31. TEXTILES AND CLOTHING[108]

Basic facts and figures on the sector

The European textile and clothing sectors[109] account for approximately 4.5% of total EU manufacturing production and 7.5% of manufacturing employment. According to the latest structural data available (EU-27, 2006), it employs about 2.4 million workers in 220,000 enterprises, which generate a turnover of about €188 billion. Recent years have been very difficult for the textile and clothing industry. After substantial falls in production in the beginning of the current decade (-5% per year in average), production showed signs of stabilising (and, in some subsectors, of recovering) in 2006. Production in 2007 remained stable at the same level as in 2006. Both textile and clothing have shown the same trend in production terms, while turnover in the clothing sector showed a bigger increase (+1.9%). These improvements reflected the recovery of the whole economy, the increase in the consumption of textile products, in particular in the new EU Member States. The industry has undergone extensive restructuring, and now consists not only of manufacturers but also a number of vertically integrated businesses covering both manufacturing and retailing. Performances varied among EU countries. Countries such as Bulgaria, Poland, Greece, Austria and Italy have performed well, especially thanks to the clothing sector, while in Germany only the textile sector has performed well, thanks to innovative textiles. Countries such as France, UK and Ireland presented the worst performances. Declines were observed in employment (-6% in each of the last two years), but this was accompanied by gains in productivity (+2%). Within the EU, productivity varies widely; it is lower than average in all new Member States. Personnel costs in the textiles and clothing industry are around 40% lower than in the industry in general. Huge labour cost differentials with the main competitors are leading to lower price-competitiveness than in manufacturing in general.

Competitiveness assessment

The *strengths* of the EU textiles industry are:

- High quality of production in technical, aesthetic and fashion related terms.
- Structures that allow rapid benefit to be derived from emerging technologies (e.g. nanotechnologies, ICTs, new materials).
- Approximation and leadership in the main consuming markets (US and EU).
- Strong EU brand names with a strong image worldwide.
- Well trained and experienced workforce.
- High levels of productivity, especially in some segments of the textile sector (e.g. technical textiles) where technological and engineering efficiency in production process and products is more present.

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[108] Data in this section derived from EUROSTAT, and OECD for external competitiveness data, as well as ACTE (Association of Textile and clothing Regions in Europe) for regional data.

[109] NACE 17 and 18

- Industry providing a high level of employment in local areas thanks to a wide network of indirect jobs and activities related to the main manufacturing process.

The *weaknesses* of the EU textiles industry are:

- Growing shortage of skilled human resources with higher education (e.g. textile engineering).
- Access to financing for SME.
- Insufficient protection of intellectual property rights.
- Need to increase investments in research and innovation.
- Costs of compliance with environmental and chemical legislation can be very high.

The *opportunities* for the European textiles industry include:

- Converging technologies allowing the use of progress in chemistry, biology, medicine, engineering etc. to new technological approaches for production of new textiles (multi-functional textiles, etc.
- EU firms are positioned in market segments where demand is growing, such as high fashion clothing and innovative textiles.
- Rapid adaptation to market needs.

Possible *threats* to the European textiles industry are:

- Trade barriers in important and dynamic export markets.
- Regulations that impose administrative burdens.
- Growing competition from imports sourced from economies outside the EU.
- Illegal copying of design and brands.
- High energy costs in subsectors such as synthetic fibres and finishing, especially electricity costs as an indirect effect of climate change legislation.
- Relocation of investments outside the EU.

R&D and innovation

The Technology Platform for the Future of the Textiles and Clothing, led by industrial and academic stakeholders, is an open network of professionals involved in textile and clothing related research and innovation across Europe. The platform aims to ensure the long-term competitiveness of industry and to reinforce the position of Europe as a leading global player in the development and manufacturing of fibres, textiles, textile-based products and apparel. More than 20 European textile research projects, with a total budget of over €200 million, are currently running under the 6th and 7th EU research framework programmes (FP6 and FP7). In

2007, technical textiles for intelligent personal protective clothing and equipment were chosen as one of the six areas for the initial stage of the Lead Market Initiative for Europe. The aim of the initiative is to foster the emergence of lead markets with high economic and societal value. For each market, an action plan for the next 3-5 years has been formulated, with initiatives such as improving legislation and encouraging public procurement, as well as standardisation, labelling and certification.

Knowledge and skills

Thanks to the high level of skills in the EU, the textile and clothing sector has maintained its competitive edge in the world markets. However, many enterprises have recently experienced difficulties in recruiting staff who would be suited to the new need for specialised skills related to the changes in textile and clothing. In particular, the growing use of the technological advances by the sector or its internationalisation will create needs for new skills in areas such as languages, negotiation of contracts with international partners, supply chain management, legal issues of intellectual property protection, material science and engineering, nanotechnology and fibre science engineering.

Market structure: Competition

Since 1990, the Commission has approved 15 mergers, of which four have been subject to remedies, and one has been prohibited. Since September 2005, a fine has been imposed for one violation of antitrust rules. Only some textile groups (brand names) are looking to consolidate vertically, in order to get closer to the consumer. Small flexible clustered units seem better able to maintain their competitive position. The only exception is the synthetic fibres sub-sector, where a gradual consolidation process with mergers and acquisition is taking place both at EU and at international level. The aim of these operations is to rationalise industrial production and to develop new products (technical textiles) and specific brand names. Given the decline in production and the resulting excess capacity in the synthetic fibre sub-sector, no State aid to this sub-sector is allowed under the current State aid framework.

Market structure: Regulation

The purpose of looking at specific regulatory issues in the textile and clothing sector is mainly to increase information about the fibres used in the textile products and to provide an appropriate level of health and consumer protection in the EU countries. Directive 96/74/EC, which is regularly adapted to technical progress, aims to provide coherent consumer information throughout the EU by harmonising the use of fibre names. Other legislation affecting the textiles industry is of a horizontal nature, covering the environment, social and employment issues, and the internal market. The industry has problems with the protection of design and brands. Implementation of the relevant legislation throughout the EU needs to be improved. Furthermore, there is a need to raise the awareness of right-holders, in particular SMEs, of the existing possibilities to protect their rights, both in the EU and in third countries.

Environment

In addition to other more pressing challenges in the area of competitiveness, environmental issues remain a priority for the sector. One of the two main pieces of legislation at EU level affecting the textile and clothing industry is the Integrated Pollution Prevention and Control (IPPC) Directive of 1996, which includes installations for the pre-treatment or dyeing of fibres or textiles. The implementation of this Directive will speed up the modernisation

process and lead to considerably less pollution by the affected installations. SMEs make up a significant part of all IPPC installations in Europe, and over 95% of the textile and clothing companies. Given that a study undertaken by the Commission established that the majority of SMEs are "vulnerably compliant" as far as the existing environmental legislation and regulations are concerned, Member States may want to provide special support to operators who lack the resources to cope with the administrative and cost burdens of the IPPC Directive. In general, from a textiles and clothing point of view, the various tools that already exist – including environmental management systems, labelling schemes, and improving the availability of information to all stakeholders – need to become more product-focused and user-friendly for the sector. For example, the Eco-label for textile products is considered to be burdensome for companies to apply for, and lacking in visibility from the point of view of customers and consumers. As well as EU-level action to improve these tools, further efforts by industry players and national authorities are needed in order to publicise and harness their potential to create a competitive advantage for the sector, while at the same time improving environmental performance. The new proposal for a revised Emissions Trading Scheme Directive stipulates that, by 2010 at the latest, the Commission shall determine the energy intensive industry sectors or sub-sectors that are exposed to a significant risk of carbon leakage. In the textiles industry, this is likely to concern mainly finishing activities, and also preparations used in spinning synthetic fibres. As far as REACH is concerned, the textile and clothing industry is a highly intensive downstream user of the chemicals industry, and chemical substances provide an important source for its innovation and its international competitive advantage. Relatively low margins on textile chemicals and limited possibilities to absorb or pass on the REACH costs may in some cases lead to more rapid rationalisation of the textile chemicals portfolio. Specifically, if certain textile chemicals of critical importance become vulnerable to withdrawal from the market, textile companies could face significant reformulation and adaptation costs and time-to-market problems. Furthermore, the workability problems related to the downstream user obligations, some of which are specific to the textile sector, could have an impact on costs and competitiveness. However, REACH could also bring business benefits and innovation by increasing the knowledge about textile chemicals.

External competitiveness

The EU textile and clothing sector is one of the two biggest players in the world market. It represents 29% of world exports after China, which occupies the first place with 40% of world exports. The trade balance has been deteriorating since 1999 (it was in deficit by about €43 billion in 2008). China is now the source of 35% of EU imports in volume and 38% in value, presenting a steady increase since quota liberalisation in 2005 and following the EU-China agreement to control Chinese export growth until 2008 in order to secure a smooth(er) transition towards a liberalised trade market.

Regarding market access, the tariffs of most of our trade partners remain prohibitively high, including tariff peaks among OECD countries. Moreover, non-tariff barriers (NTBs) require priority treatment, as they are becoming more common and are not being efficiently tackled in the WTO. In addition, the continued prevalence of various NTBs in the area of textiles and clothing is a significant disincentive for SMEs to participate in and benefit from international trade. Based on market access analysis, as well as analysis of NTBs notified to the WTO carried out by the Commission services, a number of main barriers have been identified which are of relevance for the multilateral negotiations on non-agricultural market access (NAMA). In particular, the EU has proposed harmonisation and greater transparency on barriers such as

labelling, certification of conformity procedures, export restrictions and registration of importers. Increased market access to emerging economies, where the middle classes are growing, is of strategic importance, as these represent a quality-conscious market where the EU has the highest competitive advantage. In order to dismantle more effectively such NTBs the EU has created a new market access working group dedicated to problems encountered by the textile and clothing industry. This forum is a platform for industry, economic operators as well as Member States to find solutions for obstacles to market access in third countries.

Regarding relocation, increased competitive pressure from Asia plus the market power of multinational branding or retailing companies are pushing towards FDI or the outsourcing of the whole production process, and not just garment-making, mainly to China. Relocation is more limited when the industry is focused on quality upgrading. Regarding Intellectual Property Rights violation, brand and product piracy is one of the biggest threats to the EU industry. According to OECD estimates, fake products account for about 8% of global trade. Apart from legislative and political measures and awareness raising, the Commission's Customs Action Plan, as well as bilateral Action programmes and Dialogues with non-EU countries, could help here. Development of the Euro-Mediterranean zone would enhance the competitiveness of textiles and clothing in the region. Furthermore, a successful and balanced outcome of the Doha Development Agenda remains important for the sector, as it is a tool for improved market access in the currently closed or highly protected markets. Finally, market access potential could be improved by efforts to negotiate Free Trade Agreements with markets that have high potential, such as Korea, India and Mercosur.

Employment and geographical dimension

Due to its labour intensive nature, the economic weight of the textile and clothing sector is higher in terms of employment than in terms of value added. At the level of the EU, textiles and clothing occupies around 7.5% of the industrial workforce. Italy, with around 30% of the production, is the main producer within the EU. There are major differences between Member States. In Lithuania, Portugal, Romania and Bulgaria, textiles and clothing represent close to 20% of the industrial employment. In the new Member States in general, textiles and clothing employment occupies well above 10% of the industrial workforce, as in Italy and Greece. The importance of textiles and clothing in national economies is often magnified by their strong regional concentration. Although regional data are not available for all EU countries, it is known that several regions with a very high share of employment and production of their national textile and clothing sector are heavily dependent upon this sector. The regions of Northern Portugal and the Flanders textile district concentrate close to 80% of their respective national employment in textiles and clothing. Other important regions are Severočeský (CZ), Macedonia (GR), Catalonia (ES), East Hungary, North-Rhine-Westfalia (DE), Lombardy (IT), North West and Yorkshire (UK) and Rhone Alpes (FR).

Areas of growth (within the sector)

- Technical textiles and textiles for industrial uses;
- Non-wovens;
- Carpet industry;
- High-end clothing products;

- Protective textiles (for specific uses such as army, civil services, hospitals etc.)

Response to structural change

In response to competition pressures, T/C companies have undertaken a lengthy process of restructuring and modernisation. They have reduced mass production and simple fashion products and concentrated instead on a wide variety of products with higher value added and technological content. Competitiveness has also been maintained by delocalising the production of lower range productions and labour intensive activities to the Euro-Med zone. Mass production has been delocalised to Asian countries. In addition, globalisation and technological process have led to new forms of clustering strategies for the sector, which has become an important competitiveness factor. Cooperation at local level has been diversified to cover a wider geographical area (Euro-Med).

Structure of sector

By far the majority of the companies in the sector are micro-companies. According to Eurostat statistics in 2005 in the textiles/clothing sector:

- 85% of companies had 1-9 employees, whereas in the whole industry 78.3%;
- 5.7% of companies had 10-19 employees, whereas in the whole industry 10%;
- 5.7% of companies had 20-49 employees, whereas in the whole industry 5.7%;
- 3.5% of companies had 50-249 employees, whereas in the whole industry 4.1%;
- 0.5% of companies had 250-employees, whereas in the whole industry 2%.

Sector-related services

Apart from sub-contracting relations developed with third country producers in the context of delocalisation strategies (especially in the Euro-Med zone), services that play important role for the sector include design for textile and clothing. Designers and design agencies offer a broad spectrum of services in various areas of design for the sector (industrial, product, fashion), ranging from product development through to the establishment and management of brand identities in the market. In addition, textile services such as laundry, rental and maintenance are increasingly important to the growing area of high-tech and innovative textiles, being critical for ensuring optimal performance over the whole life-cycle of the product.

Vulnerability to financial crisis

Traditionally, the trend in the European textile/clothing sector is considered to be linked to the behaviour of households' consumption. However, the development of a large number of specialty textile products for a variety of end users in different branches of the economic activity has made the up-stream part of the sector (textile) more dependent on the general economic cycle, as its outputs are mainly used for industrial and services applications. The clothing subsector is oriented much more towards private consumption. These structural links partly explain the different extent of the impact of the economic crisis (as reflected in production trends) between the clothing subsector (-1%) and the textile subsector (-8%) in

2008. As of summer 2008, the performances of all textiles activities deteriorated, a trend which was reflected in production, turnover and monthly indices based on orders. The subsectors most affected during 2008 were weaving (-10%) and spinning (-15%), which continued their downward trend from previous years, but at a faster pace. In the last quarter of 2008 the fall in the production of textiles accelerated (-17% compared to the same period in 2007), and accelerated further in the first quarter of 2009 (-24.5% compared to the same period of 2008). In clothing, the decline in production was around 3% by the 4th quarter of 2008 and it has accelerated to 15% in the first quarter of 2009.

The developments in new orders seem to suggest that the textile subsector will continue to suffer a bigger impact than clothing production. In the last quarter of 2008, new orders in textiles were 16% lower than one year earlier, whereas for clothing new orders fell by 5%.

In 2008, the impacts of the economic and financial crisis are also reflected in lower demand from some of the developed trade partners, such as USA (-15% exports in value) and Japan (-7% exports in value). In 2008 the export growth of textile and clothing products was halted, and for the year as a whole there was a slight reduction of -0.8% in value. At the same time, imports in value have remained stable.

Average employment losses in the sector in recent years were of the order of 120 000 per year (-5%/year). This trend accelerated in 2008 (-7%).

Cash flow of companies is fragile in general, as a result of payment gaps between distribution and the industry, on the one hand, and the short production cycles and the predominance of SMEs, on the other hand. Consequently, short term capital availability is crucial. According to the European Industrial Association, one of the main problems facing the sector is the sudden refusal by the banks to accept credit guarantees and export credits allowances, which is accelerating the impact of the credit crunch within the sector. Also some sub-sectors were already undergoing restructuring (synthetic fibres, cotton and wood industry) before the crisis, and the crisis is likely to seriously affect this process. Acceleration of job losses is to be expected.

32. WOOD PRODUCTS[110]

Basic facts and figures on the sector

The EU wood products manufacturing industries or woodworking industries[111] (WWI) include the production of sawnwood, wood-based panels and other wooden products, including: builders' joinery and carpentry, containers and other wooden packaging, and other wooden articles. The latest structural data available show that in 2006 these industries employed 1.27 million people in 197,000 firms. Altogether these firms have a turnover of €134 billion and an added value of €37.2 Bn. In order of production value (or turnover) the subsector's ranking is: builders carpentry and joinery; sawmilling; panels; other wooden articles; packaging. After a drop in output in the early years of the decade, wood and wood products regained momentum after 2002 and production in 2007 was 9% up on 2000. However, in 2008, production declined by 8% as compared to 2007, with a sharper fall of 14% coming in the fourth quarter. Annual turnover dropped by 10%, falling further still (-15%) in the fourth quarter of 2008. The decline in production has accelerated in the first quarter of 2009 to reach -22% compared to the same period of 2008.

Competitiveness assessment

The construction sector is the single biggest user of wooden products in the EU. Wood often competes directly with products of other materials in this sector. Lower-cost competition within the EU market comes mainly from China, and more recently from Vietnam, increasingly for panels and added-value wooden goods such as flooring, whereas Brazil is still a major supplier of panels, especially plywood.

Strengths:

- sustainable and increasing forest resources, producing most of the EU WWI's fresh wood raw material;
- high-quality innovation and design for both products and processes;
- excellent sectoral knowledge centres, including for RTD;

Weaknesses:

- increasing competition for wood raw material from the renewable energy sector;
- high fixed and variable costs, including wood, energy and labour;
- low investment in plant, R&D and education, training and skills;
- poor public image, especially among young people;

Opportunities:

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110 Figures in this section are from Eurostat. Data on skills is from a study carried out in 2006.

111 NACE 20.1, 20.2, 20.3, 20.4 and 20.5

- a much higher level of post-consumer wood recovery, re-use and recycling, including energy extraction;

- development of innovative and added-value products and systems, including wooden composites with other materials for both green building (e.g. engineered wood products – EWP), fittings and consumer products;

- carbon-storage capacity of harvested wood products (HWP) in response to climate change;

- export markets (e.g. China, Japan, India) for added-value wood and composite building products and systems;

- harnessing increased wood mobilisation for both wood products and renewable energy (for wood manufacturing and grid supply);

Threats:

- continuing supply of low-cost and increasingly high-quality imports of added-value goods, especially from China, Vietnam, etc.;

- constricted supply of imported raw material from Russia;

- continuing market access restrictions (e.g. India, Japan, Southern Africa; Near East);

- phytosanitary issues (e.g. pinewood nematode outbreak);

- impact of climate change on forest health and productivity.

R&D and innovation

Traditionally, much of the technological development has been led by machinery manufacturers and independent research centres, such as university departments or other dedicated establishments, rather than the WWI per se. Often these bodies work under contract to the larger wood-based panels firms and sawmills which have capacity to finance and apply advanced technology for product and process development and process-control systems. Increasingly, specialist EU companies are developing products and systems for wooden construction products, such as pre-fabricated wall panels and flooring systems, following their original innovation in North America as engineered wood products (EWP). The Wood Group of the Forest-based Sector Technology Platform (FTP) has developed sector-specific parts of the Strategic Research Agenda.

Knowledge and skills

The Working Group on the Enhanced Use of Wood and the industry's "Road Map 2010" identified the mismatch in the supply and demand of education, training and skills development in and around the sector as a major limiting factor to its growth. The lack of mutual acceptance of qualifications between EU Member States further restricts mobility. Following a detailed survey, remedial work has started under the FTP, initially for the tertiary level, with technical and operative levels to follow. Awareness and knowledge of wood as a technically and environmentally advanced material amongst key decision-makers, such as architects and planners, is vital to its enhanced (wider and appropriate) use.

Market structure: Competition

The sawnwood subsector is international from a supply point of view, although consumption is more concentrated in some Member States specialised and is mostly linked to construction. Wood-based panels and packaging, on the other hand, are more nationally oriented in terms of both supply and demand. State aid to the WWI is difficult to assess because only major cases are notified by Member States. Nevertheless, some of these cases have been important and about €150 million of aid was approved between 2001-5 on investments, valued at over €500 million, mostly to the sawmilling and wood-based panels sub-sectors, concentrated in a few MS. Between 1990 and 2005, only seven WWI mergers were subject to Commission scrutiny and all of those were approved.

Market structure: Regulation

Most EU and MS regulation affecting the sector is horizontal, for example the EU Directive that is being drafted to implement the 20% renewable energy requirement, which will include sustainability criteria. (Wood provides 80 % of EU biomass and 60% of EU renewable energy sources - RES). National RES implementation through national (Biomass) Action Plans will be key. Linked to this, wood resulting from agri-forestry and fuelwood development under CAP reform measures is more likely to be used for energy than for wood products. The EU Construction Products Directive (CPD) sets non-materially based performance requirements for building products, which need to be incorporated into harmonised European Standards (or into European Technical Agreements in the case of innovative products). However, not all MS have yet adopted the use of EU standards, thus perpetuating the status quo at national level. Also, the CPD is itself under revision. Sectorally, EU phytosanitary directives apply to the import of roundwood and sawnwood and also to the import and export of wooden packaging, for which conditions are based on an international standard.

Environment

Horizontal legislation affects all stages of wood manufacture, including the Strategy on Bio-diversity and Natura 2000, and land use planning. These all have strong implications for forest resources and hence for wood raw materials. Downstream, climate change policy (e.g. emissions trading, linking the directive and post 2012 targets) and thematic strategies (recycling; sustainable use of resources, soils, waste issues) all affect manufacturing processes, as do IPPC (e.g. surface treatments, BREF, discharges to air and water) and the VOC Directive and legislation on dangerous substances. Legislation emerging under the EU FLEGT Action Plan requiring all marketed wood and wood products put on the EU market to be subject to a due diligence system would add to the requirements on wood products, and the already existing use of eco-labels, the Integrated Product Policy and the Directive on packaging and packaging waste.

External competitiveness

A small percentage (+/-10 %) of the EU WWI's wood raw material is imported, most of it from other temperate and boreal coniferous and non-coniferous forests. Over the last decade or so, Russia has provided up to 60 % of such imports, but rising export taxes have reduced that flow. A number of voluntary partnership agreements (VPAs), mostly with tropical wood exporting countries, are being negotiated and signed under the EU's FLEGT Action Plan. Imports from those countries will be subject to licensing, and will be controlled at the point of entry to the EU. Although only a small but growing proportion of the WWI's production is

exported, it still posted an overall negative trade balance of €2.7 billion in 2008, whereas sawnwood and some panels are showing small trade surpluses. The main clients for EU exports in 2008 were: Switzerland, Norway and the USA. Competition on imports is mainly from China (now the world's fastest growing producer, consumer and trader of wooden products), Russia and Latin America (mainly Brazil), with also some from south-east Asian countries (ASEAN). Based on sustainable and high-quality EU sawn timber, glued-laminated beams and panels, there are export opportunities for markets such as Japan, where North American standards have long been recognised. Building on the recent work of the EU-Japan Wooden Building Experts' Dialogue (WBED) under the EU-Japan Regulatory Reform Dialogue, efforts are under way within the private sector European Wood Initiative, CEN, MS Notified Bodies and the Japanese authorities to improve the recognition of EU wood species and standards for wooden building products. Niche export markets, especially for EU flooring products, have built up in the US over recent years. However, this is not only threatened by the slump in US housing starts (down from 1.8 M in 2006 to 0.8 M in 2008; the knock-on effects may also see other historical US suppliers unloading on international markets, including the EU. Despite this, India remains a large, long-term target for EU wood exports, but still maintains its high tariff and non-tariff barriers.

Employment and geographical dimension

Employment in the EU woodworking industries has declined steadily over the last 10 years. In 2008, it fell by 1.9% compared to 2007, and its level is currently 8% lower than in 2000.

From a structural point of view, detailed data are only available for 2003. They show that high-skilled workers accounted for only around 9% of the employed WWI workforce, with low-skilled workers comprising 49% and medium-skilled workers around 41%.

The European social dialogue within this sector since 2000 has provided scope for action between the social partners. The social dialogue enables the social partners across Europe to address the common challenges facing their sector in a consensual and innovative way. The challenges they are addressing include: the development of sectoral 'ethics' through the promotion of corporate social responsibility and fundamental rights; the promotion of sustainable development; promoting the use of wood in construction and other sectors (e.g. renewable energy); and education and training.

Areas of growth (within the sector)

The production of sawnwood and panels (except plywood) as commodity products is likely to continue to expand, particularly in export markets. The more sophisticated use of composite wooden components in green building systems has huge potential.

Response to structural change

Incremental concentration is taking place amongst some medium-sized and bigger firms. However, for smaller firms to benefit from R&D and up-dated knowledge and skills, on-line learning and other forms of networking would be essential. Life-long learning would also be vital.

Structure of sector

The sector is somewhat fragmented and its company size distribution is skewed towards SMEs. There are a few large enterprises and a small number of sawmills in the wood-based

panels sub-sector. There are also many more full-time and part-time jobs in micro enterprises which appear not to be listed in the official statistics.

Sector-related services

Manufacturers of woodworking machines and process-control suppliers are vital in maintaining competitiveness through savings in raw material and energy use.

Vulnerability to financial crisis

Like most other sectors where SMEs predominate, firms in the EU WWI are likely to encounter reduced access to financing for both working capital and investment capital. To some extent, though, the need for the latter will be postponed by the greater uncertainty which seems set to continue for at least a couple of years. However, the effects on investment in innovation, RTD and education can only be negative in the medium-to-long term.

Demand for wooden goods has already dropped and is likely to remain at lower levels than previously for one or two years, probably not returning to its recent record levels except in the new EU Member States and in emerging third-country markets. Whilst new export markets may offer some respite, depending on the strength of the euro, there might also be an influx of cheaper commodities such as sawnwood and panels. In any event, the drop in orders can be offset by part-time working and temporary shut-downs in industries such as sawmilling and wooden packaging, whereas in the more capital-intensive wood-based panels sector, shut-downs could be permanent. If uncorrected by recovery, any slack in demand by wood-processing industries for wood raw material will probably be largely taken up by the energy sector, although prices may be lower than of late. One possible solution – as for other SME sectors – could be to work on short-term, part orders instead of cancelling bigger orders altogether. However, this would also require rapid payments through the business chain to help restore work flows.

Between 2007 and 2008 production declined by 7.8% year-on-year. However, production in the last quarter of 2008 fell more sharply (by 14%) compared to the same period in the previous year. The decline in production has accelerated in the first quarter of 2009 to reach -22% compared to the same period of 2008.

Annual turnover fell by 10% between 2007-8, a trend which further accelerated (to 14.6%) between the third and fourth quarters. This was almost double the fall in production over the same period, and was probably a reflection of lower sales prices.

As regards trade by value, imports dropped by 13% (€1.9 billion) between 2007 and 2008, whereas exports fell 6% (€0.6 billion), thus improving the trade balance.

ANNEX 1

EU manufacturing production growth rate [1]

data presented as a percentage change over 12 months

NACE code	Sector name	average growth 2001-6	average growth 2007	average growth 2008	Nov-08	Dec-08
D	EU manufacturing	1,5	4,0	-1,7	-8,2	-12,8
DA 15	Food & beverages	1,8	1,8	-1,1	-2,9	-2,2
DJ 28	Fabricated metal products	1,8	5,4	-2,0	-9,6	-15,7
DK 29	Machinery & equipment n.e.c.	2,2	7,9	1,6	-5,5	-7,5
DM 34	Motor vehicles	2,6	5,4	-5,5	-20,1	-32,3
DG 24	Chemicals & chemical products	3,1	2,3	-1,5	-7,6	-15,3
DE 22	Publishing & printing	0,0	1,1	-3,0	-5,6	-7,7
DN 36	Furniture; manufacturing n.e.c.	-0,8	2,6	-3,8	-8,3	-8,9
DH 25	Rubber & plastic products	1,4	4,2	-4,4	-12,2	-20,5
DL 31	Electrical machinery and apparatus n.e.c.	1,3	5,3	-0,7	-8,3	-12,6
DI 26	Other non-metallic mineral products	0,8	2,7	-6,3	-10,9	-19,7
DB 18	Wearing apparel	-5,9	0,8	-2,4	3,2	-4,0
DD 20	Wood & of products of wood	1,3	1,7	-7,8	-11,0	-17,4
DJ 27	Basic metals	0,9	1,6	-3,0	-14,9	-26,4
DB 17	Textiles	-3,6	-0,2	-8,0	-13,7	-17,0
DL 33	Scientific and other instruments	2,8	4,2	2,0	-3,1	-0,7
DM 35	Other transport equipment	1,8	3,2	2,8	1,6	4,9
DL 32	Radio, TV and communication equipment	3,5	6,9	4,1	-2,3	-8,3
DE 21	Pulp, paper & paper products	1,5	2,8	-2,5	-7,8	-10,7
DC 19	Leather	-6,7	-2,6	-7,0	-8,6	-14,4
DF 23	Coke & refined petroleum	0,8	1,0	2,6	2,4	0,3
DL 30	Office machinery & computers	0,5	17,5	7,6	-3,5	-0,9
F	Construction	1,2	3,9	-1,1	-2,7	-6,7

Source: Eurostat

EU employment growth rate [1]

data presented as a percentage change over 12 months

NACE code	Sector name	Number of persons employed ('000)	average growth 2001-6	average growth 2007	average growth 2008	Nov-08	Dec-08
D	EU manufacturing	34.413	-1,5	0,4	-0,2	-1,8	-2,3
DA 15	Food & beverages	4.645	-0,3	-0,3	0,4	-0,6	-0,9
DJ 28	Fabricated metal products	4.000	0,2	3,3	2,4	0,6	-0,2
DK 29	Machinery & equipment n.e.c.	3.650	-1,3	3,1	2,1	0,7	0,3
DM 34	Motor vehicles	2.235	-0,4	0,5	1,0	-0,8	-1,7
DG 24	Chemicals & chemical products	1.900	-1,5	0,2	-1,0	-1,9	-2,3
DE 22	Publishing & printing	1.820	-1,9	-0,4	-2,1	-2,7	-2,6
DN 36	Furniture; manufacturing n.e.c.	1.800	-1,5	-0,2	-1,6	-3,4	-4,0
DH 25	Rubber & plastic products	1.750	0,0	1,5	1,2	-0,3	-1,1
DL 31	Electrical machinery and apparatus n.e.c.	1.710	-1,1	2,0	1,5	-0,2	-1,2
DI 26	Other non-metallic mineral products	1.587	-1,9	1,7	-1,9	-4,8	-5,1
DB 18	Wearing apparel	1.390	-5,6	-6,3	-6,9	-8,0	-8,5
DD 20	Wood & of products of wood	1.269	-1,1	-0,3	-1,9	-4,6	-4,9
DJ 27	Basic metals	1.100	-2,8	-0,6	-0,1	-1,4	-2,0
DB 17	Textiles	1.060	-5,6	-6,3	-6,7	-9,3	-9,9
DL 33	Scientific and other instruments	1.042	0,2	2,8	1,0	0,6	0,5
DM 35	Other transport equipment	917	-1,0	2,7	3,2	1,6	1,2
DL 32	Radio, TV and communication equipment	772	-4,9	-1,5	-1,9	-4,4	-4,4
DE 21	Pulp, paper & paper products	715	-1,8	-3,3	-1,7	-2,0	-2,2
DC 19	Leather	549	-4,5	-3,0	-6,3	-8,7	-9,4
DF 23	Coke & refined petroleum	168	-2,7	0,6	-0,4	-0,7	-0,8
DL 30	Office machinery & computers	155	-5,7	0,0	2,6	2,3	0,8
F	Construction	**14.093**	**-1,1**	**2,0**	-2,6		

Source: Eurostat

Intra EU Exports growth rate

data presented as a percentage change over 12 months

NACE code	Sector name	average growth 2001-7	average growth 2008	Dec-08	Jan-09
DM 34	Motor vehicles	6,6	-8,4	-37,9	-45,6
DF 23	Coke & refined petroleum	11,8	28,4	-38,9	-43,1
DJ 27	Basic metals	14,0	-1,6	-28,3	-42,7
DD 20	Wood & of products of wood	6,7	-12,6	-24,3	-33,8
DK 29	Machinery & equipment n.e.c.	6,3	-1,2	-14,1	-26,6
DL 32	Radio, TV and communication equipment	-0,8	-2,1	-14,2	-25,2
DL 31	Electrical machinery and apparatus n.e.c.	6,6	0,0	-12,5	-25,0
D	EU manufacturing	6,2	0,6	-14,1	-24,9
DJ 28	Fabricated metal products	8,1	1,7	-13,5	-24,3
DH 25	Rubber & plastic products	7,3	-2,2	-15,2	-23,1
DL 30	Office machinery & computers	-4,8	-10,1	-15,8	-23,1
DI 26	Other non-metallic mineral products	5,1	-2,6	-11,7	-21,8
DE 21	Pulp, paper & paper products	2,6	-3,2	-9,1	-21,0
DB 17	Textiles	0,6	-6,8	-10,2	-19,4
DG 24	Chemicals & chemical products	8,9	2,8	-4,9	-18,8
DN 36	Furniture; manufacturing n.e.c.	5,5	1,5	-2,8	-18,1
DL 33	Scientific and other instruments	6,8	-1,3	-4,9	-14,3
DC 19	Leather	2,1	-2,7	-2,1	-11,1
DA 15	Food & beverages	6,5	7,9	3,1	-9,7
DE 22	Publishing & printing	-0,9	-0,9	-1,3	-7,1
DB 18	Wearing apparel	3,3	-1,0	1,6	-3,6
DM 35	Other transport equipment	-4,2	-0,5	9,7	2,8

Source: Eurostat, DG TRADE