

ECGA

EUROPEAN CARBON AND GRAPHITE ASSOCIATION



A N N U A L R E P O R T

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*From carbon to metal
in Europe, for Europe*



Foreword by the President

2006 was another positive year for our key customer industries and the current year 2007 started with good premises. The open question that was hovering in my foreword for our 2005 Annual Report, i.e. whether or not Mittal Steel would be able to conquer Arcelor, is now history and the steel industry counts with a new giant. In the meantime, another development in the same direction took place, with Tata Steel buying the Corus Group in March 2007.

Consolidation is continuing and with it globalisation is progressing. Moves are taking place in the suppliers' industries as well, where the SGL Group (recently so renamed) announced their decision to build a new plant for graphite electrodes in Malaysia and GrafTech International sold to Alcan its shareholding in the manufacture of cathodes blocks for the aluminium industry.

Our Association was very active in 2006 in the area of environmental regulations, with a major project related to the **risk assessment on coal tar pitch**. This project was coordinated by the Secretary and her staff, involved many plants and experts of our member companies and is a prime example of the usefulness of a common approach to industry issues.

On the horizon of the Association, there is another major regulation coming into force in the European Union on the 1st of June 2007, called **REACH: "Registration, Evaluation and Authorisation of Chemicals"**. This is a wide-reaching system that will require a substantial effort by our members and by the Association in order to ensure compliance and a smooth application of the rules, avoiding possible disruptions in the operations and excessive economic burdens in terms of investments.

In the area of safety, the members of the Association are making continuous efforts to improve the frequency and severity rate indexes year after year, an improvement process with the aim of protecting our employees and their own safety at work.

My best thanks go to the dedication and initiative of our Secretary General, Dr Corina Hebestreit, and Ms Marleen Bellen, especially in the project on risk assessment of pitch. Thanks also to all our members and the persons involved in the Committees, an essential instrument of our Association.

Dr B Toniolo, President

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Photos

Photo: Electric Arc Furnace © GRAFTECH Int.

Photo: Cathode © SGL Group

I. The European carbon and graphite industry and its contribution to the downstream EU industry

In the industrial fabric of Europe the carbon and graphite industry is on the one hand situated between the oil industry and the metal smelting industry as a supplier to major downstream industries in Europe and at the same time it is a sector providing high-tech products to a large variety of end users in the area of specialities graphite.

The sector therefore supports any policy initiatives that can support the EU industry's competitiveness in general.

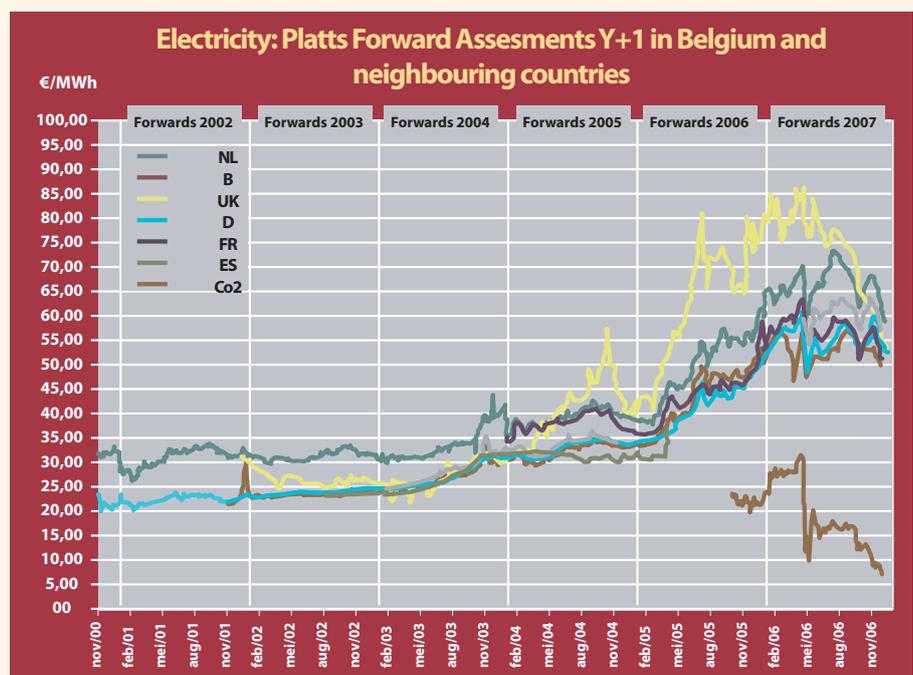
In 2006 the carbon and graphite industry monitored very closely Commissioner Verheugen's initiative of a High Level Group to develop a new strategy on the competitiveness of the EU industry and how this could be reconciled with the EU's energy and environmental policies. This concerted effort between Commission, Parliament, Member States, NGOs and industry was perceived as a major signal that industry should be encouraged and enabled to stay in Europe and that finally the European policy makers are seriously debating how this can be achieved.

The carbon and graphite industry's concern in particular is what happens with energy and raw material supply and prices in Europe. It is a key factor of the competitiveness of the sector and its downstream customers.



Energy issues

In this context in particular the sector was looking forward to the outcome of the first working groups on **energy and related issues** since the carbon and graphite industry itself is also user of substantial amounts of energy and the rising costs in the past years have threatened the competitiveness of the EU industry in comparison to its global competitors. Parts of the carbon and graphite industry can be considered energy intensive due to the fact that for example the graphite electrode which is an integral part of all types of steel making requires substantial amounts of energy in order to achieve higher longevity of the electrode in the steel furnace.



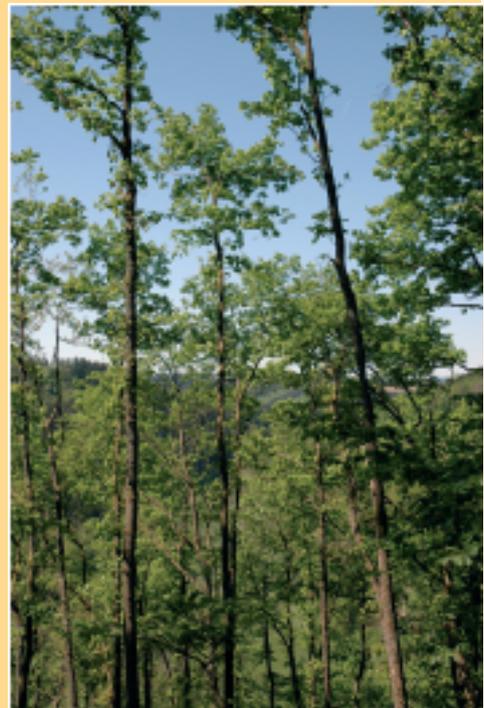
In January 2007 the European Commission launched its highly ambitious Energy Package, confirmed by the EU Ministers in March 2007. The package contains 10 major new energy and climate policy proposals and is marketed as the "new industrial revolution" for Europe.

The main measures include

1. Climate Change: EU unilateral action - "international leadership"- in cutting greenhouse gas emissions;
2. Security: Limit its dependence on external fossil fuel supplies;
3. Markets: Create a true internal energy market in which investment and renewables are encouraged.

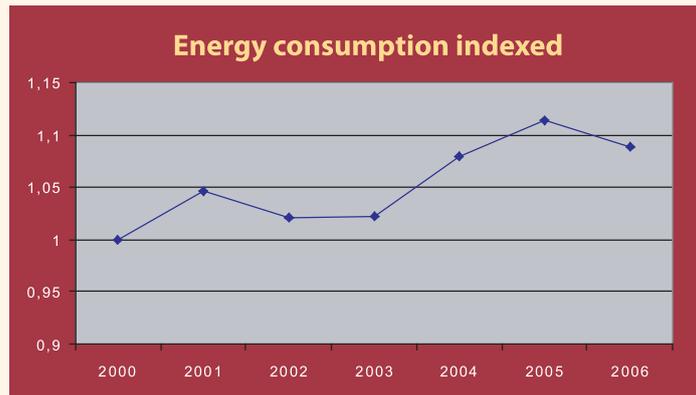
A large number of legislative proposals is to follow, some even before the summer of 2007 which will include

- ▶ **cutting greenhouse gas emissions of 20% by 2020**, including a reaffirmation of the **central role of the current EU emission trading scheme (ETS)**;
- ▶ **extending the ETS to other sectors and greenhouse gases**;
- ▶ **encouraging internationally industry sectors in developing countries** to take on green house gas emission reduction commitments;
- ▶ issuing a **strategic energy technology plan**;
- ▶ proposing that **all new coal-fired power plants should operate with carbon capture and storage (CCS) by 2020**;
- ▶ proposing that the renewables sector should **account for 20 per cent of all EU energy by 2020**;
- ▶ committing to **a 20 per cent improvement in energy efficiency by 2020**;
- ▶ developing **nuclear technologies as central** to achieving the EU's energy and climate goals;
- ▶ further liberalising **energy** markets;
- ▶ creating markets competition is to require **ownership unbundling** of energy production from energy distribution;
- ▶ targeting **investment in European energy infrastructure**;
- ▶ stronger facilitating cross-border trade;
- ▶ accompanying with regulation to provide new targets and policies for **energy intensive industries**.



Hence, whilst the specific consumption of electrodes in furnaces per ton of steel has decreased over the past decades and continues to decrease the improved quality of the graphite electrode and the abatement techniques for the environmental protection overall have increased the energy consumption per tonne of product, only partly offsetting process efficiency.

The sector welcomes the recommendations that have so far been formulated by the various energy related working groups with regard to the competitive pricing, the unbundling of the supply structures and the creation of a truly free market in energy supply in Europe.



		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Average annual specific consumption	(kg/t)	5,18	4,82	4,59	4,26	4,08	3,76	3,42	3,22	3,09	2,98	2,84	2,63	2,44	2,33	2,20	2,16	2,06	1,97	1,93	1,87	1,82	1,79
Average annual reduction vs last year			6,9	4,8	7,2	4,2	7,8	9,0	5,8	4,0	3,6	4,7	7,4	7,2	4,5	5,6	1,8	4,6	4,4	2,0	3,1	2,7	1,6
Total reduction	(%)		6,9	11,4	17,8	21,2	27,4	34,0	37,8	40,3	42,5	45,2	49,2	52,9	55,0	57,5	58,3	60,2	62,0	62,7	63,9	64,9	65,4

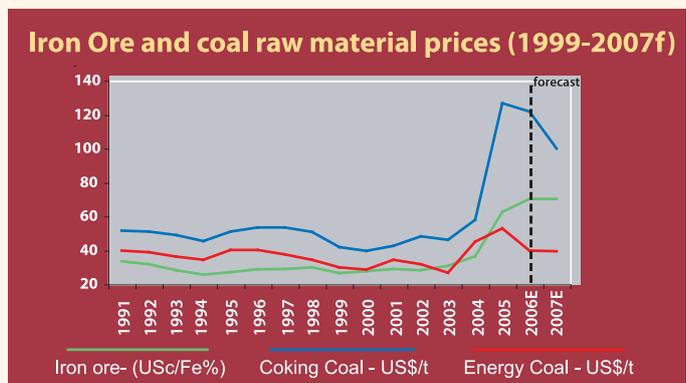
Source: IISI & SGL

Raw Material questions

For 2007 a new working group looking at the supply of primary resources, secondary materials and wastes promises to tackle the second important cost factor of the carbon and graphite industry which is the cost of raw materials.

The overall recommendations of the High Level Group which are expected for end 2007 will be important not only for the carbon and graphite producers, but also for its downstream customers, the steel and the aluminium industry.

Without better conditions for those industrial sectors in Europe, the European carbon and graphite industry will have an increasingly difficult situation.



Supply to the Aluminium Industry

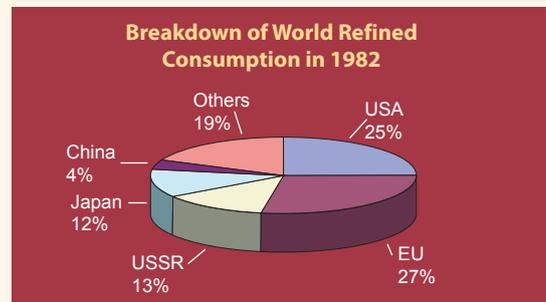
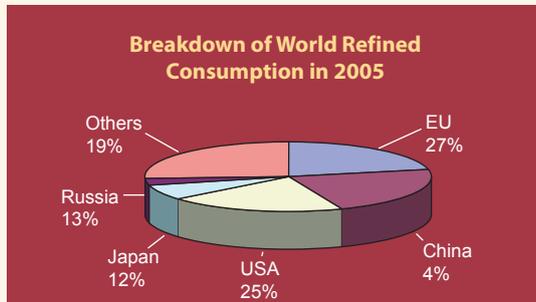
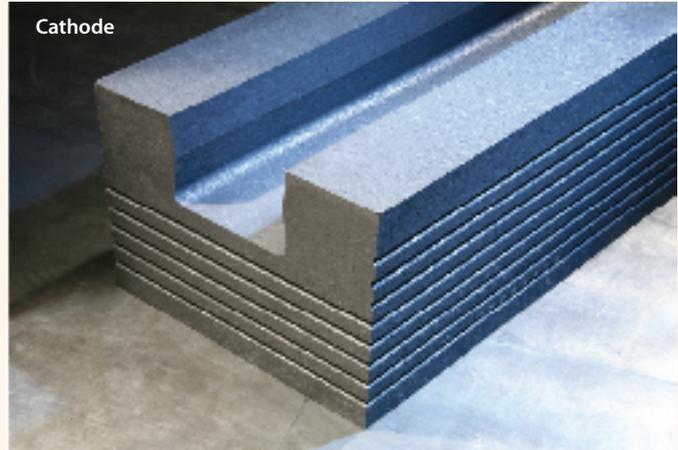
One of the major global markets for carbon and graphite products is the primary aluminium industry.

Aluminium reduction cells

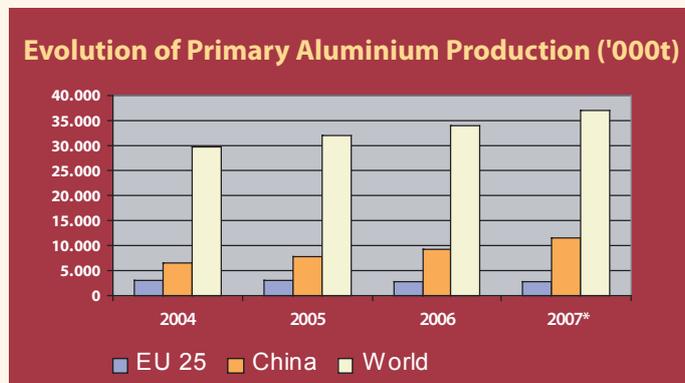
The carbon and graphite industry supplies furnace linings for the primary aluminium industry in the form of cathode blocks with which the floor of the electrolytic reduction cells are lined as well as pieces for the surrounding sidewalls. Both types of blocks are manufactured in a number of different fired qualities. Carbon ramming pastes are used to seal the joints between the fired blocks.

Demand is created by the relining of cells when they fail and by projects for the start-up of new smelters or the extension of existing plants. Developments in the aluminium industry indicate that the maintenance demand will be stable over the next five years. Meanwhile the demand created by new projects is expected to increase worldwide, with a major increase in China.

At the same time total demand for aluminium has continued to grow in 2006 on a worldwide basis, as was widely predicted. This follows growth at 7.0 to 7.5% in previous years. However, the percentage shares of consumption by region have shifted considerably in the past 12 years. Consumption in China continues to grow especially strongly. Worldwide growth is expected to continue and production will rise to meet the increased demand for the metal.



The strength of demand has been reflected in both the aluminium metal price and the alumina price. The increase in aluminium production always has a major impact on the second type of product the industry provides for the furnaces of the aluminium industry: the anodes. Due to increased consumption worldwide anode production has increased at almost the same rate. The ever-increasing efficiency of anode consumption in the smelters due to improving quality and better process control contributes to increasingly sustainable production in this area.



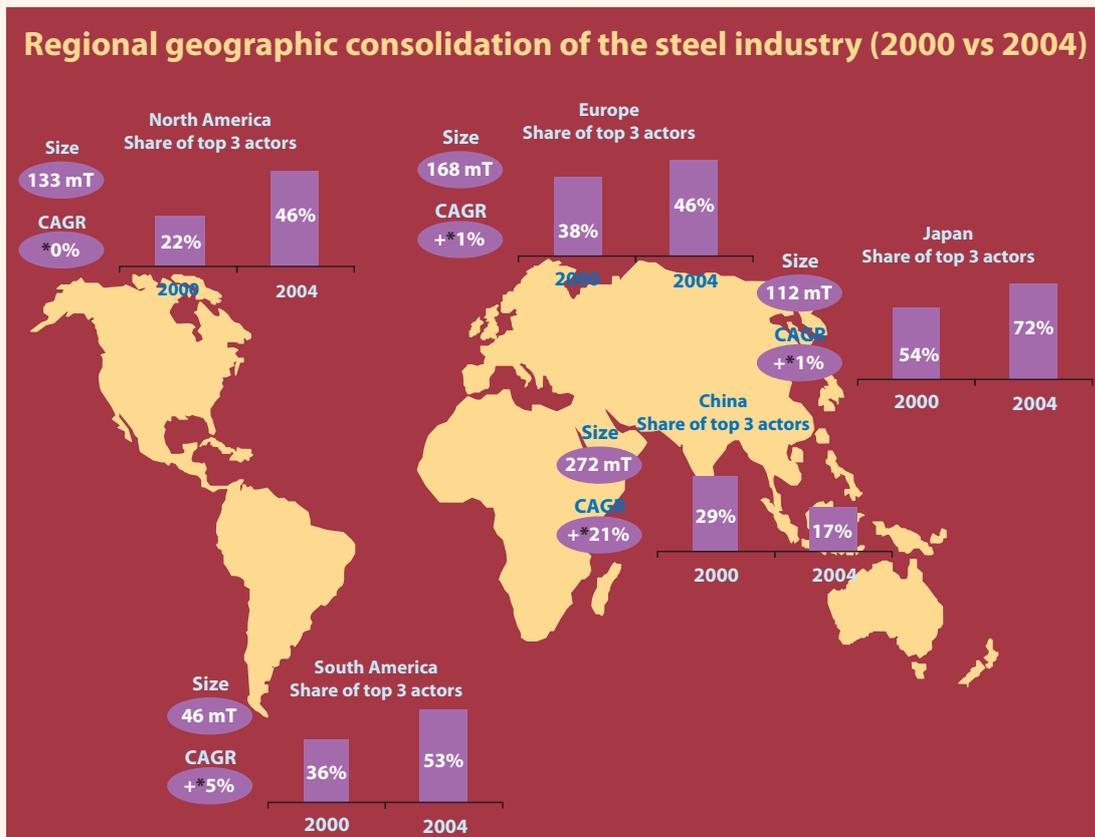
Whilst the reduction cell has been in use for over 120 years and has seen developments that have provided greater production levels and higher efficiency, there is still no effective and economically viable alternative available on an industrial scale. The committee monitors the development of new technologies and can report that there have been no significant developments in the last year.

It is widely appreciated that primary aluminium is an energy intensive industry. Smelters require a constant supply of electricity at low and stable prices in order to remain competitive. Increased power tariffs are evident in several parts of the world, including Europe and North America, and a number of primary smelters have either closed or face the prospect of doing so, hence the importance of the work of the High Level Group. There have also been increases in the prices for a range of important raw materials, including alumina, pitch and petroleum coke and this will most likely be addressed in the next HLG working group.

The ECGA's aluminium committee maintains an industry database that has been updated with details of metal production and capacity, consumption and stocks, green-field and brown-field project activity plus shut down, idled and restarted capacity to monitor the development of the downstream industry.

Supply to the Steel industry

An interesting trend in the steel industry, the creation of bigger companies by acquisition & mergers, continued in 2006 - we are now in a situation where the five biggest steel makers in the world are responsible for 19% of the output, compared to only 14% in 2000. This tendency to form large groups, thus having a better leverage on the market, may have an impact on profit margins as could be seen last spring when, as global demand showed signs of weakness, the steel industry increased its output whilst maintaining a high price level.



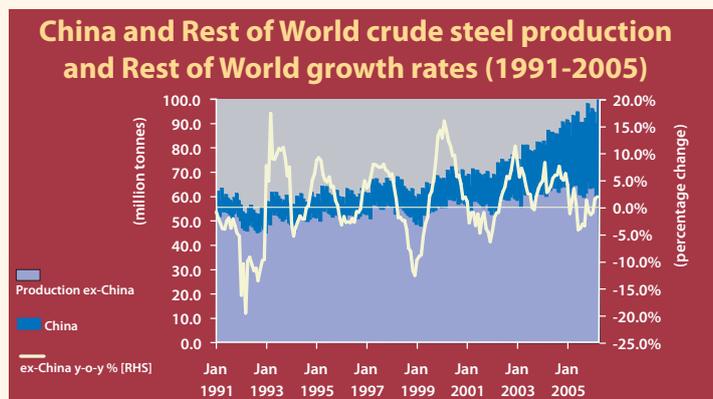
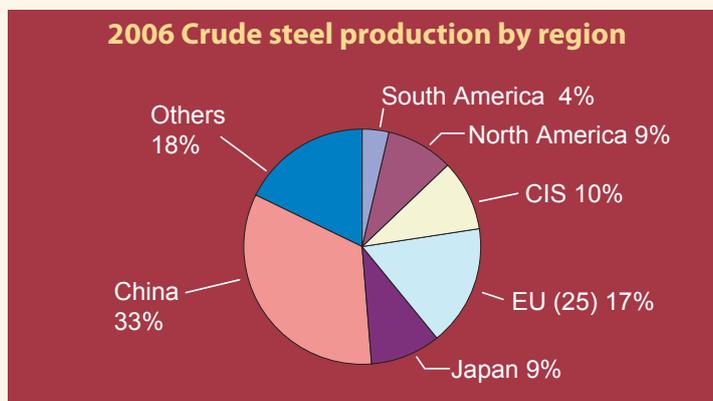
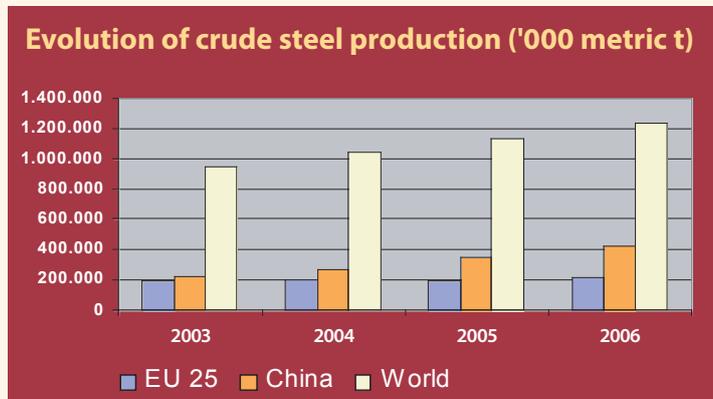
In terms of tonnes produced steel is still the number two in man-made goods. Following the very low point of the steel industry in early 2002 the European industry had experienced a dramatic turn-around and with it the European carbon and graphite industry supplying important parts for the steel production, the graphite electrode.

The largest factor for this is the influence of China, its share of the world steel consumption has risen to about 30% in 2006. The output of the world's steel industry reached new heights in recent years. Each production figure of the last years was a new world record, 2006 was no exception with 1,239 billion tons of crude steel production but chances are that this will only be a record for one year as the predicted trend goes further upwards.

The main reasons for these positive prognoses are expectations for a further rise in per capita steel consumptions in China (currently 250 kg) and especially India (currently a meagre 30 kg and this is the second most populous country in the world). The per-person consumptions of steel in the EU and the USA are at 400 kg, top of the list is Singapore with 600 kg.

Additionally, there is a growing acceptance that steel's unparalleled, wide variety of properties and its constant innovations (there is a 50% increase in new steel grades today compared to 10 years ago) make it suitable for an array of applications no other metal can provide. Due to its excellent recycling qualities, the increasing consciousness for ecological concerns also helps steel in regaining lost markets and becoming a cost-effective material of choice for a multitude of utilizations.

Especially optimistic projections already point out that the period of approximately 2000 - 2015 could become the third longest period of abiding growth in steel consumption in history, comparable to the industrialization in Europe and North America (1875 - 1900) and the reconstruction after WW II (1950 - 1970). China increased its own steel production by 229% over the period 2000 to 2006, making 418 million tons last year, well ahead of Japan with 116 million tons, the C.I.S with 119 million tons and the USA with 98 million tons. The EU 25 was at 206 million tons in 2006.



The extraordinary growth rates in Asia (especially China) helped the steel industry worldwide to achieve good turnovers and to increase the price of steel in general over the last years. On top of that the industry was even able to elevate the profit margins to healthy regions - the significant increase in prices of raw materials such as iron ore, coke and scrap additionally pushed steel makers towards efficiency increases. It appears that all this made the industry in Europe and North America much more optimistic about their chances of survival in the face of a stronger Asian market presence. "Paradigm change" may be too grand a word but a partial shift towards higher-value products of more use to customers is visible. That in return may lessen the reliance on mass production commodity steel grades and focus more on complex, end-user oriented grades that will have their place in the future, providing profits.

The growth rates of global EAF steel production for the recent years were not as steep as the increase in crude steel production, in fact, they stagnated in 2005.

The main reason is China's focus on the blast furnace route to produce steel, so most of the new capacities there were not EAFs and in order to focus more on modern steel plants they shut-down some obsolete EAF capacity. Additionally the above mentioned reduced output of some larger groups in the face of market weaknesses - if given the choice, it is easier to cut down production on an EAF compared to slow down a blast furnace - and a slight decline in stainless steel production in 2005 (these grades are mainly done via the arc furnace route) contributed to said stagnation. This does not seem to be an ongoing trend, so a moderate but steady increase of steel production in EAFs is expected.

The steel demand outlook is solid and even improving and we're bullish on a further global cyclical recovery, but a threat of excess capacity is building in China. Sustained demand in Europe is necessary for prices to hold or producers could be asked to adjust more production. Steel demand growth will reduce availability of raw materials and keep the industry cost-curve high in the near-term. Scrap steel availability is of particular concern in medium-term, but more consolidated producers should sustain profitability in an industry where asset growth is low and turnover high.



II. Trading in a globalised world: the Revision of the EU's Dual Use Regulation

In 2006 the European Commission reviewed its regime on export controls of dual use items. Since the carbon and graphite industry is concerned for a small part of their specialty graphite products due to their extreme purity ECGA has been actively involved in providing input on the carbon and graphite industry's situation, particularly in comparison to the US situation where a change in the legislation was favouring the US industry in comparison to the European industry.

The Commission's intentions were to make amendments to the regulation with regard to

- ▶ the full harmonization of the **General Export Authorisation** (Annex II to the Regulation);
- ▶ the conditions of use of the **Global Export Authorisations** (Article 6-5 of the Regulation in conjunction with ICPs (internal compliance programmes) in particular for IT transfers;
- ▶ possibly replacing **National General Export Authorisations** with new Community Authorisations;
- ▶ the transit controls (Resolution 1540 of the UNSC);
- ▶ catch all clauses (Article 4 of the Regulation);
- ▶ the sanctioning of illicit brokering for dual use items (Resolution 1540 of the UNSC).

The ECGA members were in dialogue with the Commission about the best possible amendment to the regulation in order to facilitate European exports whilst maintaining the principle objectives of the Dual Use Regulation.

The industry wanted to propose the following to the Commission:

- ▶ Free export for extruded graphite (this graphite is not intended for nuclear use).
- ▶ Licenses required only for exporting iso-graphite.

However, due to the overall political pressure in a number of member states of the EU it was not possible at this stage to obtain the necessary regulatory alleviations in order to place the European industry on equal footing with the Japanese or US competitors.

It can only be hoped that a better solution will be found in the future.

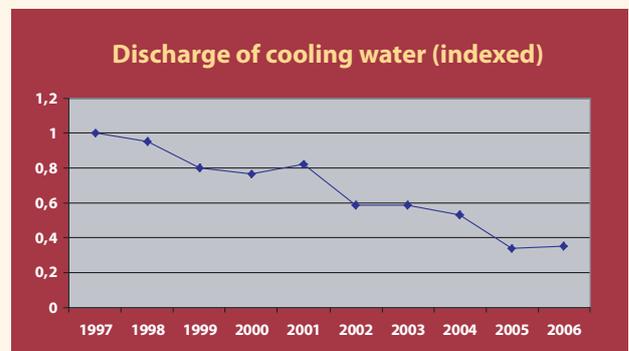
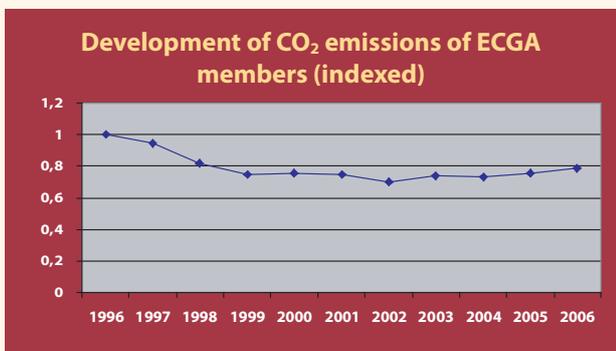


III: The EHS dimension of the carbon and graphite business - a prime concern

Protecting the environment has been a matter of course for our member companies for many years. ECGA member companies are focused on environmental protection and safety improvements on a continuous basis. Since ECGA members operate manufacturing sites across Europe and outside of Europe their performance improvement is based on a global approach and very often international standards whilst respecting the local legislative requirements.

Amongst the performance highlights are:

- ▶ ECGA members have reduced CO₂ emissions per produced tonne of material from their factories by 20% since 1996;
- ▶ the emission of non-hazardous wastes was reduced by 20% over a ten-year period;
- ▶ the reduction of cooling water consumption per tonne of produced material over ten years amounted to 45%;
- ▶ dust emissions were reduced by 50% over the same period of ten years.



To protect the environment and meet future legal requirements based on EU directives, the carbon and graphite industry will have to invest significantly in environmental protection installations to prevent air pollution in the coming years.

The capital expenditure of ECGA members for environmental protection and improvement of the working and safety conditions will amount to more than 50 million € within the next few years, the first projects have almost been launched.

In 2006 the EHS Committee has continuously monitored the development of further EU and national EHS legislation, such as REACH, the EU's chemicals regulation. According to this regulation, which covers all chemical substances many substances and their different applications have to be registered, many evaluated and finally a number of uses will have to be authorised.

In this particular area the carbon and graphite industry was actively involved in the currently conducted risk assessment on coal tar pitch as a downstream user. In addition to providing information for the environmental part of the risk assessment, as a contribution to the Human Health part of the risk assessment ECGA commissioned the German Institute for Industrial Hygiene, ANECO, to do exposure measurements in the manufacturing areas of 5 member sites. ANECO completed all



measurements regarding exposure to 16 PAH (polycyclic aromatic hydrocarbons) in a period of 6 weeks, the results were interpreted and ECGA handed over the relevant data to RIVM, the Rapporteur of the coal tar pitch risk assessment. Internal surveys and data collection provided additional information on the potential exposure of the workers to the coal tar pitch throughout the manufacturing processes at the ECGA member companies.

For the upcoming REACH regulation the ECGA members were informed extensively about the requirements for them as downstream users and for them as producers. Contacts have been established with the coal tar pitch users group in CEFIC in order to assist with the Registration and potential Authorisation of coal tar pitch. Additional meetings of the member companies' representatives were set up to define the need for common activities and to prepare common documents.

The newly proposed human health classification for coal tar pitch by the Technical Committee for Classification and Labelling would lead to additionally required investment costs for carbon and graphite production sites, the aluminium industry, the road construction industry, and pitch producers in Europe, just to name the most important ones. We need to insure that the "pitch using" industries in Europe with actually more than 200.000 employees remain competitive and innovative also in the future. Additional administrative conditions and high investment costs could put Europe's ability to compete with the industry in North America and Asia at risk.

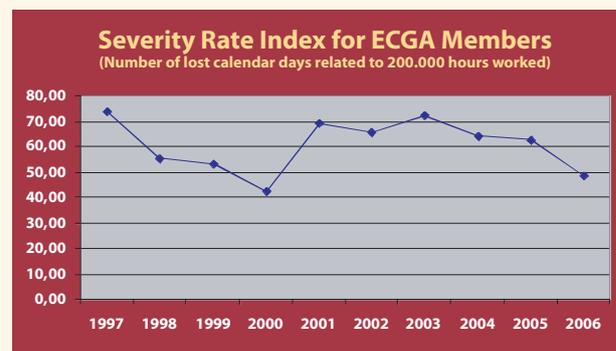
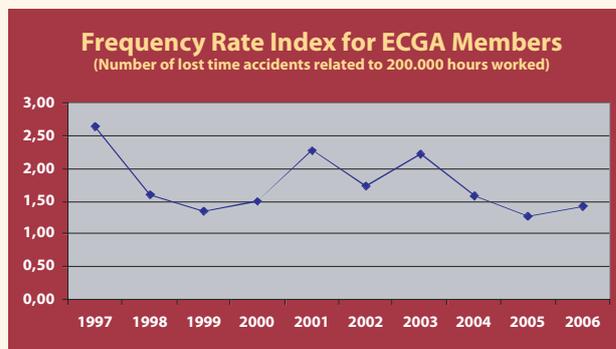
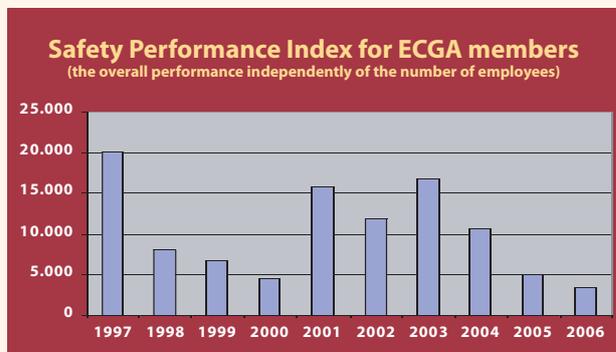
There is still a high risk that manufacturers will close down production sites because of new legislation. The risk assessment on Coal Tar Pitch and REACH are one of those examples of legislation which might very well lead to a competitive disadvantage for the European industry.

Safety Performance

Thanks to the continuous and sustainable application of highly developed Health and Safety practices by the ECGA members in the last years a successful improvement of the Safety Performance Index and a significant regression of the key accident indicators could be attained.

Through plant modernisation and streamlining, specific process instructions, consistent internal auditing and detailed accident and incident investigations this improvement could be made possible. As it can be seen in the presented charts not only the number of accidents (frequency rate) declined but also the absence of the job - time (severity rate) caused by accidents.

Although the efforts and measures of the ECGA members to establish and maintain high-level environmental standards during the last years as a result of stringent legislative requirements the future requirements might hamper the industrial activities and the global competition.



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