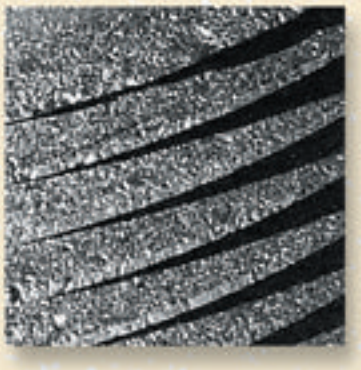
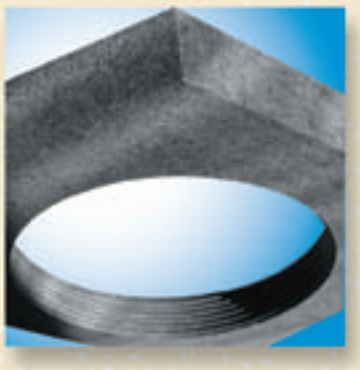
ECGA

EUROPEAN CARBON AND GRAPHITE ASSOCIATION

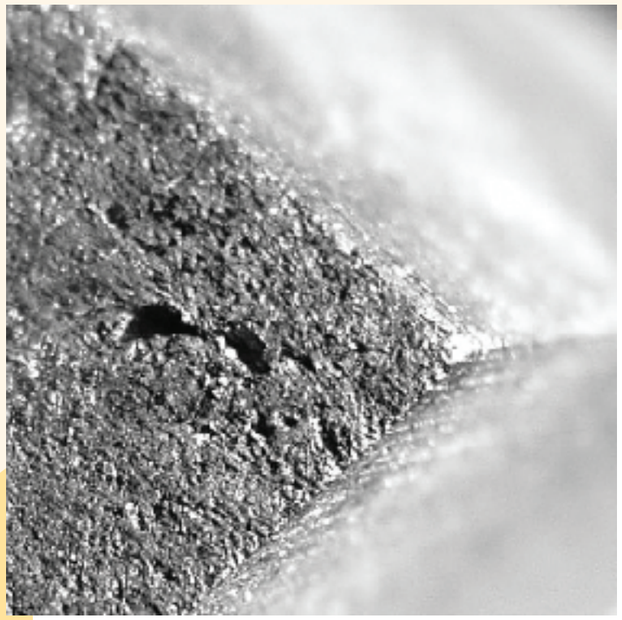


ANNUAL REPORT

2002

Another difficult year for the carbon and graphite industry



The carbon and graphite industry can look back on 2002 as a year of very varied developments in its key client industries of steel, aluminium and silicon. Steel was typical of this: while production of both total and electric steel by China (the largest steel producer in quantitative terms) rose by more than 20%, the figures in our members' main outlet markets were much lower. Only North America saw rises of 3% for total steel and about 8% for electric steel. Worldwide the production of total steel and electric steel rose by almost 7% each. In Europe, the production remained stable. The electric steel's share stabilised at about 35% worldwide, the share of the so called western world amounted to 41%.

Rising energy costs, depressed graphite prices and unsatisfactory utilisation of capacity curbed profits, forcing competitors in Europe and America to quit the market.

International shifts of emphasis challenged ECGA to force an international exchange of the latest legislative changes, e.g. on the environment, health and safety, international standardisation of exchangeable products and trade regulations.

ECGA successfully held a second international meeting with the North American association (NEMA) and its Japanese counterpart (JCA) in Brussels. The standardisation proposals made there now form the basis of a joint review of the old, superseded IEC standard for electrodes in Geneva. JCA has extended an invitation to a further meeting in Tokyo in April 2003, to discuss further co-operation in future.

ECGA has followed the European Chemical Policy white paper with interest. It has held discussions with the EU Commission about this, and about opening its own agency, to monitor the process of licensing old and new chemicals (more than 170 000 substances). Most of the chemicals concerned have since come under discussion with a view to simplifying the licensing procedure.

ECGA's main focus is observing development on the environment, health and safety in and outside the carbon and graphite industry. We continued to write our summary datasheets on cutting energy consumption, emissions etc. Close co-operation with our main European coke suppliers led to Conoco Ltd., of the UK, joining ECGA.

A promotional program has been devised for the broad spectrum of carbon and graphite products, including special graphites. This means that a publication can be prepared, aimed at the relevant user industries and technical and scientific universities.

I would like to take the opportunity, once again, to thank all participants at the committees and meetings for their contributions in 2002. We shall continue to make every effort for the good of our industry in 2003.

Dr Gerhard Rose, President

Index

1. Environment, Health and Safety,Audit

Mr M. Rouy
(Ucar S.N.C.,
chairman as of 1 January 2003)

Participating members: Mr T. Akyel (ERFTCARBON GmbH & Co KG), Mr J.S. Høsteng (Elkem ASA Group), Dr J. Idzko (SGL Carbon AG), Mr K. Kahl (C. Conradty Nürnberg GmbH), Dr H. Tillmanns (SGL Carbon)

ECGA members are continuously striving to improve their environmental performance in order to contribute to sustainable development. Integrated EHSA management and EHSA orientated production techniques are an integral part of this strive.

By following this principle for years the carbon and graphite industry has already significantly reduced its environmental impact in the past, thus fulfilling the main objective of the Integrated Pollution Prevention Control regulation of the EU. Many of these measures taken by industry have been voluntary years before they became obligatory. The latest efforts of the carbon and graphite industry lead to an impressive further reduction in past years as demonstrated below.

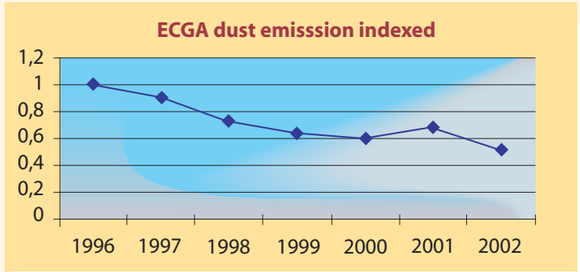
Air pollution

The change of the total impact on air caused by emissions can by described by the total air pollution index which indicates a significant further reduction of pollution of about 14 % over the past four years.
Reduction in overall air pollution could be achieved by the modification of the production procedures to environmental friendly technologies, the use of resource saving manufacturing processes, and finally by the installation of advanced abatement techniques. Examples for the different approaches to reach the objectives are

- change of graphitizing procedure from Acheson to Castner technology, reducing the resources use of raw material and especially electrical power,
- the improvement of existing abatement techniques to increase the efficiency and the development of advanced technologies in co-operation with abatement equipment suppliers. The application of the fourth generation of regenerative incineration is an impressive development resulting in a significant lower total air emission and a drastic reduction of the energy demand for the combustion process. But it has to be pointed out that this abatement technology has still to be considered as an emerging technology, due to the fact that some aspects have to be improved further to meet all set targets and future demands.

Specific reductions can be seen in some of the emissions, as for example in the case of dust emissions, which are of particular interest in the context of the EU's policy on reducing particulates.

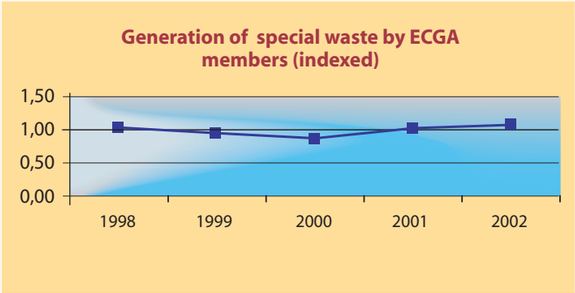
The new installation and improvement of filter installations has had a continuous effect of dust reductions from the sector.



Special wastes

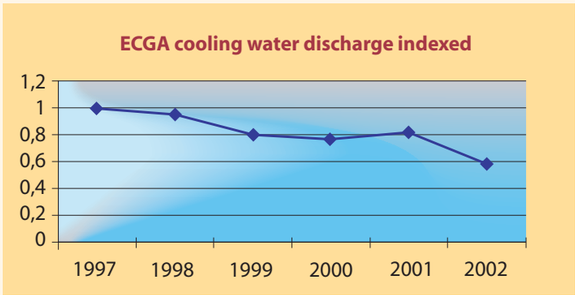
The industry has put major efforts in reducing special wastes and their treatment.
Measures taken include
- the application of advanced production and abatement techniques causing lower waste quantities,
- the saving of resources of raw material leading to lower quantity of residuals,
- the separation of residuals into three major fractions,
- material fraction - useful to replace raw material and contribute significantly to raw material resources saving without any necessary pre-treatment,
- non-hazardous waste fraction – for disposal and re-use respectively re-cycling after treatment,
- hazardous waste fraction – minimisation of the hazardous waste fraction by a reliable and severely controlled separation process.

The special waste index, however, demonstrates that the reduction by ~ 14 % in the years 1998 to 2000 which has continued in the following years is offset by changes in regulation which increased the classification of wastes as hazardous.



Water recycling

The increased efforts of the sector in contributing to the conservation of water resources can be seen from the increased recycling of cooling water and its reduced emission of such water.

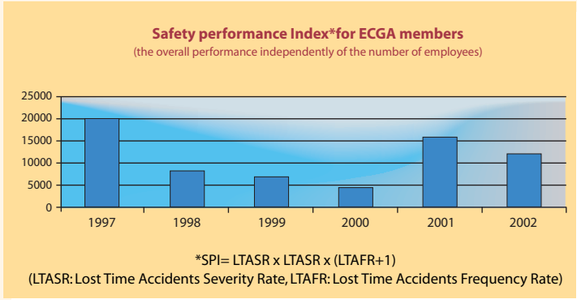


Safety Performance

The sustainable development in the safety performance in recent years, including the number and severity of accidents, is documented in the diagram as a steady downward trend of reduced accidents and consequently injuries. Such results can only be achieved by including all levels of employees and management, in particular, in safety awareness and improvement programmes. Temporarirly increased levels are due to neerly acquired installations that are integrated into the H&S management systems.

The improvement of safety performance is one of the key objectives of ECGA members. It can be achieved by setting clear targets which can only be guaranteed through close, practice-oriented co-operation with European and national authorities, the introduction of the industrial expertise to the process of revising and creating regulations and open communication with our customers and the public.

The ECGA and its members are clearly committed to playing an active role in improving processes under economically and technically viable conditions in order to reduce the impact on the environment and to create safe working and living conditions for all their employees, customers and neighbours.



Other activities

During the year 2002, the EHSA Committee continued on sharing information and data on:
- Material Safety Data Sheets,
- Product and Transport Labelling and Regulation,
- Evolution of the European Environmental regulation, notably:
  . Implementation of the European Pollution Emission Register,
  . Directive on CO_2 Emissions Trading,
  . Chemicals Policy,

In 2002, the EHSA Committee started having special technical workshops with the participation of external experts. The first one was dedicated to the emerging technology of Regenerative Thermal Oxidation. Experiences on pilots of RTOs installed on pitch fumes emitting plants were presented by Mr Bauknecht, Eisenmann.
It was agreed by the Committee members that this type of technical workshop was very interesting and that the EHSA Committee will organise some other similar workshops with external expert guests.

In 2003, a special workshop on the up-date of the Coal Tar Pitch Risk Assessment in the frame of the European White Paper on Chemicals Policy will be organised, with the presence of a member of the International Tar Association.

2.EU Energy policy

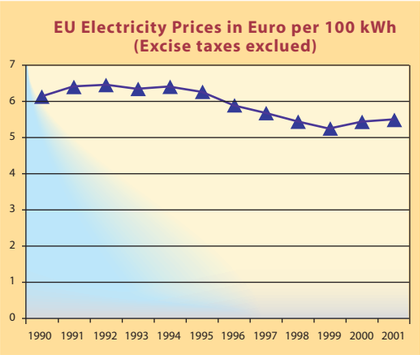
Since the carbon and graphite industry can be considered an energy intensive user, the EU policy related to energy supply and energy product is always of high interest.
Any EU's policy on climate change and measures related to energy production and consumption may have a substantial impact on the competitiveness of the sector.

The sector is always concerned with the three main pillars of the EU Energy Policy:
- the security of supply, since the sector is highly dependent on a secure energy supply;
- the respect for the environment, which the sector is continuously striving for by reducing its energy consumption;
- the energy price, which is a major factor in ensuring the sector's competitiveness.

If these aims are not fulfilled by the EU's energy policy in an appropriate way, there is still the risk of de-localisation of industry outside the EU for competitiveness reasons.

Energy taxation

On March 20, 2003 the EU Finance Ministers reached a consensus on the Energy Taxation Directive which ended 6 years of debate.
Energy taxation is together with the Greenhouse Gas (GHG) Emissions Trading Scheme, one of the two key policy orientations identified by the European Commission to reach the Kyoto protocol targets of an 8 % reduction of GHG during the period 2008-2012 in comparison with the 1990 level.



Source: EU web

The objective of the Directive is to widen the scope of the Community system of minimum tax rates, currently limited to mineral oils, to encompass all energy products (notable coal, gas and electricity) and to update the minimum rates for mineral oils, which have not been revised since 1992.

The Directive imposes minimum levels of taxation that will be reviewed periodically for each energy product, and includes a number of derogations. The Directive will come into force as of 1 January 2004.
The Directive foresees an exemption for the **dual use** of energy (electricity used principally for the purpose of chemical reduction and in electrolytic and metallurgical processes) and foresees specific reductions in favour of energy-intensive businesses. This would apply for the carbon and graphite industry and it is assumed at the moment that the competitiveness of the sector would therefore not be jeopardized.

EU Greenhouse Emissions Trading System

On 9 December 2002 the Environmental Council agreed on the basic rules for an EU-wide CO_2 emission trading system, and subsequently other greenhouse gas (GHG) emission allowances.

- From 2005 to the end of 2007 the scheme will apply to all companies responsible for CO_2 emissions in the electricity, steel, cement, glass, tile production, paper and cardboard sections. As of 2008, however, it may be extended to other sectors (chiefly the chemical and aluminium industries).

- Company participation in the system will be compulsory for the second period (2008-2012). During the first period, the Member States will be authorised to request Commission approval to exempt certain companies or activities of the latter assuming that they succeed in achieving equivalent reductions in CO_2 emissions through existing national provisions.

- The Member States may allow companies within one and the same industrial sector to form voluntary trading pools for the entire duration of the scheme.

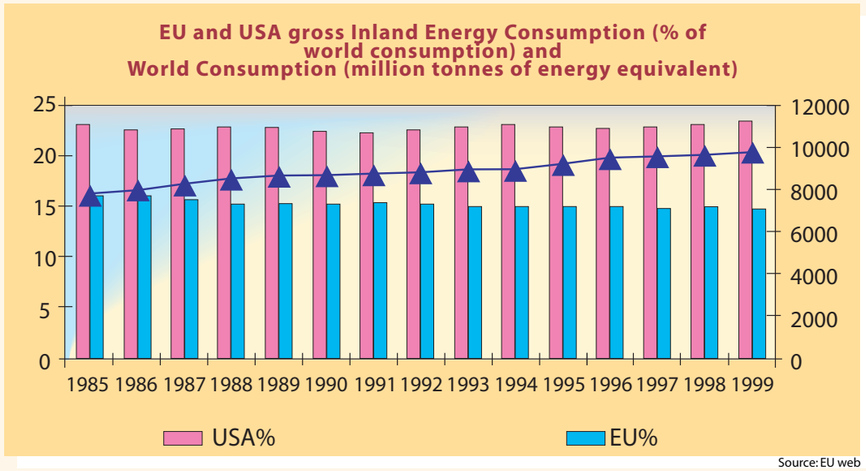
- The Commission will develop allocation criteria to guide the Member Sates by December 2003, and retains the right to veto over national emission allowance plans.

- The fine for exceeding emission gaps during the first 3 years will be 20 Euro per tonne of CO_2, subsequently rising to 100 euros from 2008 onwards.

If the EU scheme will work without any major complications it can be expected that a sector such as the carbon and graphite industry which is closely linked to the steel and the aluminium industry will be included in the second phase after 2008. It will be closely monitoring the experiences made in the steel industries.

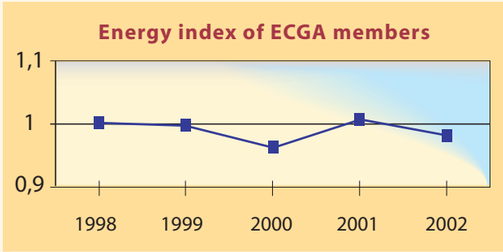
Energy consumption

In general terms energy consumption has again decreased in Europe whereas in the USA it has again slightly increased.



Source: EU web

The European carbon and graphite industry itself has also made major efforts to improve its energy balance either by investments in different and improved technology or by optimising existing process technology.
Developments over the past few years have been fairly positive for industry in general, insofar as emissions are already below the 1990 levels. Over the past seven years energy consumption per tonne of product has remained stable.

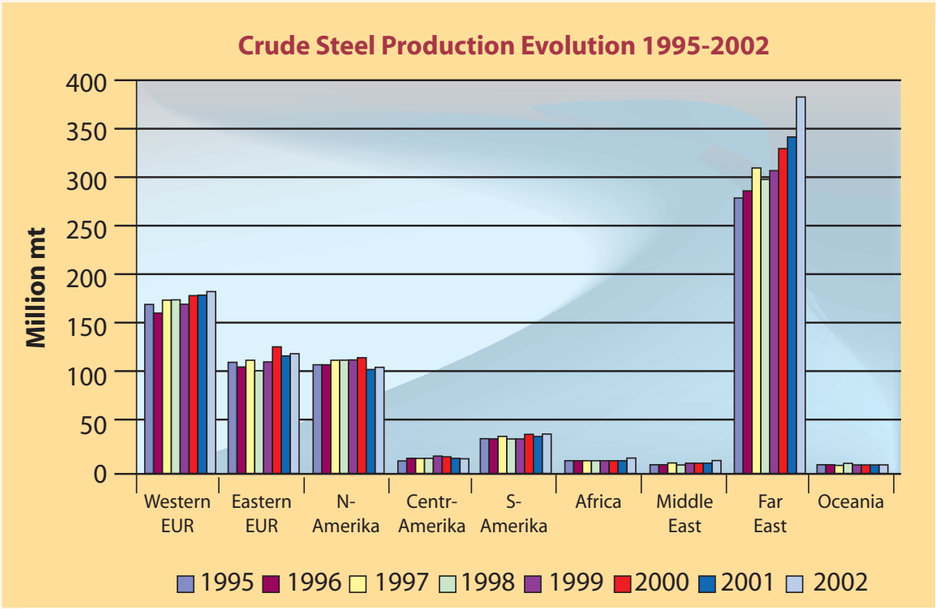


Dr H. Weinzierl,
Conradty Cova Service,
chairman

3.1 Steel

Participating members: Mr G. Baust (ERFTCARBON GmbH), Mr P. Heinrich (SGL Carbon Group), Mr P.N. Higgins (Conoco Ltd), Dr H. Jäger (SGL Carbon Group), Mr R. Thomsen (ERFTCARBON GmbH), Mr G. Uehla (Conradty Elektroden)

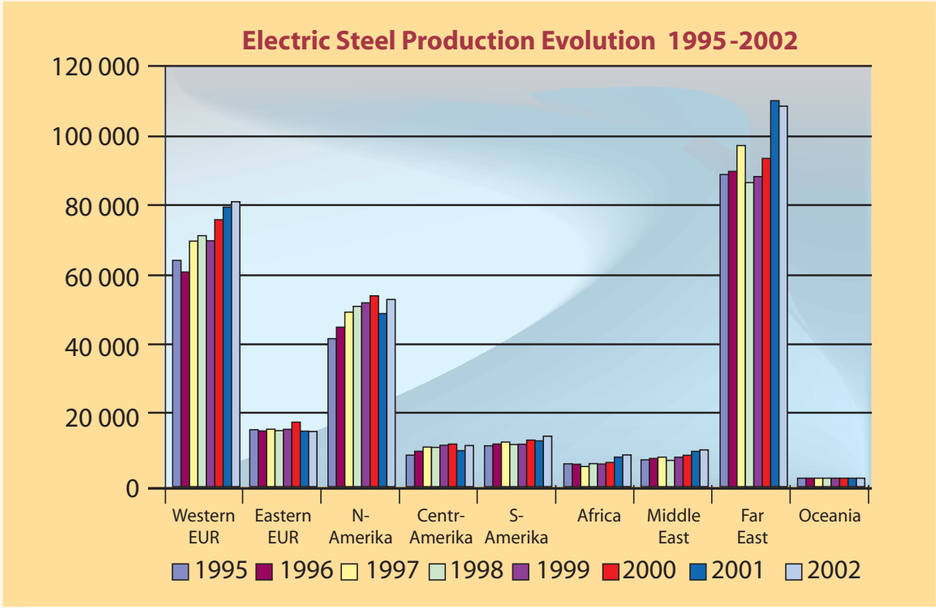
Worldwide total crude steel production reached in 2002 a historical maximum of 886,7 Mio mt. This is an increase of 6,4 % compared with 2001, which was mainly characterised by the September 11th crash, followed by a worldwide economic downward trend. All areas show an increase in steel production in 2002 compared with 2001 and most of them also exceed the figures of the year 2000, which was up to now the best year according total steel production.



source: IISI

Especially Asia recovered and this area alone was producing 43 % of total worldwide steel and here China has an outstanding position, because with total production of 181 million mt of steel (20 % increase compared with 2001!) they are leading in front of Japan and North America with a big gap. The percentage growth rate of the GDP in China was in the last years always over 7%, compared with the rest of the world where it was always fluctuating between 1% and 3%. Moreover medium term forecasts from IISI until year 2006 show a minimum annual steel production in China of 215 million mt (+ 18 % compared to year 2002). For the rest of the world such forecast is only about 2 % of increase according steel production.

The share of electric steel, for which graphite electrodes are used, is still on an upward trend and reaches in 2001 worldwide 35,8 %. In China, this share is still about 24 % and it is most likely, that it will increase in the future as the advantages of electric steel production compared to so called oxygen steel, produced in blast furnaces, like lower investment costs, more flexibility and more environmental friendly production become important.



source: IISI

Scrap as the main raw material for electric arc furnaces is traded worldwide. The biggest net scrap importing area is Asia; one of the main reasons is maybe the relatively low recovery rate of obsolete scrap of about 30 % compared to almost 60 % in the western world.
The specific electrode consumption in kg graphite/mt steel in Western Europe is still going down, but the reduction during last 5 years compared with the same period before is significantly reduced.

Total Steel Production 1984 -2002

	WORLD						EUROPE					
	1984	1997	1999	2000	2001	2002	1984	1997	1999	2000	2001	2002
TOTAL CRUDE [mio t]	594	799	789	847	850	902	157	177	172	180	176	176
TOTAL ELECTRIC [mio t]	178	270	264	283	290	304	47	70	70	76	75	81
SHARE ELECTRIC %	30,0	33,8	33,5	33,4	34,1	34,0	29,9	39,5	40,7	42,2	42,6	46,0

source: IISI

Dr D. John,
Vesuvius-Premier Refractories Ltd.,
chairman

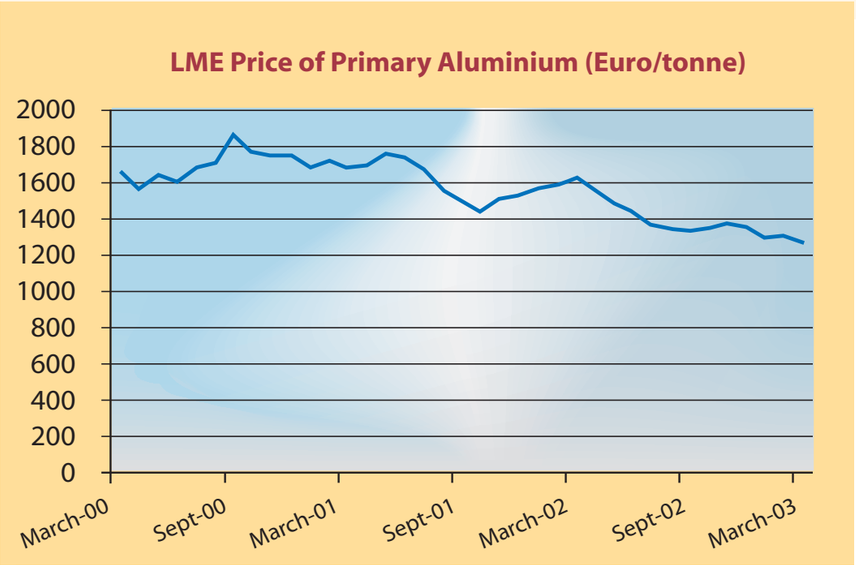
3.2 Aluminium

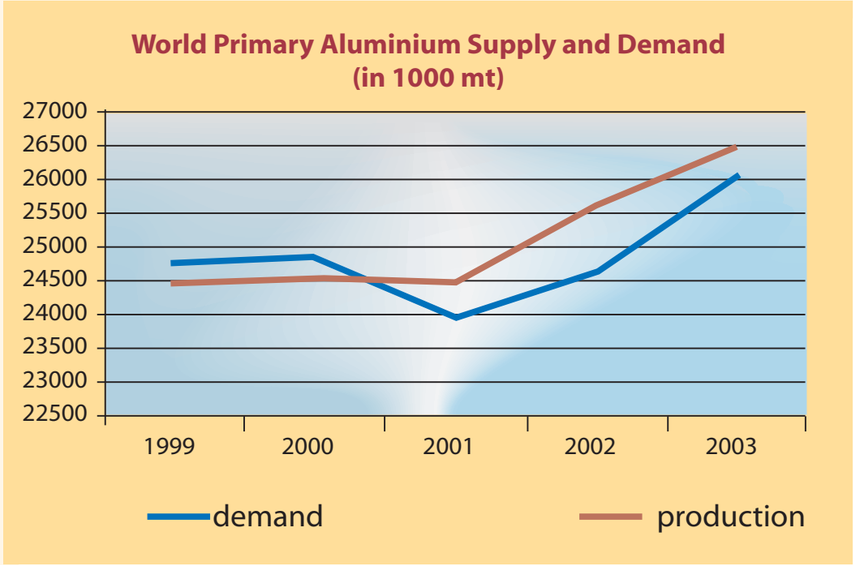
Participating members: Dr R. Becker (Aluminium Rheinfelden GmbH), Mr J. Cibulec (DEZA a.s.), Dr E. Guajioty (SGL Carbon Group), Mr J.A. Johansen (Elkem ASA Carbon), Mr H. Nawrocki (ERFTCARBON Gmbh & CO KG)

The Aluminium Industry

Carbon cathode, sidewall blocks and ramming pastes form the cathode of the electrolysis cells in which aluminium is produced. The primary aluminium industry is thus a key market for the carbon and graphite industry and its present condition and future development are of great interest to carbon producers.

The aluminium committee has maintained statistics for metal production by country, plus metal consumption and import / export data for Europe and worldwide. Whilst the prospects for its long-term growth remain good the aluminium industry is presently enduring a short term slow down, with the single exception of China as noted below. The situation is reflected in the evolution of the metal price.





The committee has maintained and further developed the spreadsheet begun in 2001 to cover the global aspects of aluminium industry, i.e. capacity by country, the number of smelters, idled / closed capacity and green-field and brown-field projects.

Several smelter expansion projects have been ongoing in 2002. The high level of activity observed in China is particularly relevant to the long-term development of the industry. Industrial growth within China and increased consumption per capita indicate increasing demand in future.

A number of smelters in the north-west USA have closed at least temporarily due to the local power situation and several other smelters across the globe are threatened by the adverse economic situation.

Carbon Products

Aggregated data indicates an increase in demand for carbon materials from 2001 to 2002. The higher level of demand is predicted to be maintained in 2003 and remain stable thereafter.

Mr Cibulec of Deza gave a presentation on the coal tar and pitch industry in Poland and the Ukraine, including the centres of production and the domestic and export markets they serve.

Technology

The issue of spent pot linings generated when old furnaces are demolished, and which include carbon products, continues to be of concern to the aluminium industry. The committee keeps under review the technology available for the treatment of these wastes, new technologies that are under development and the legislative situation.

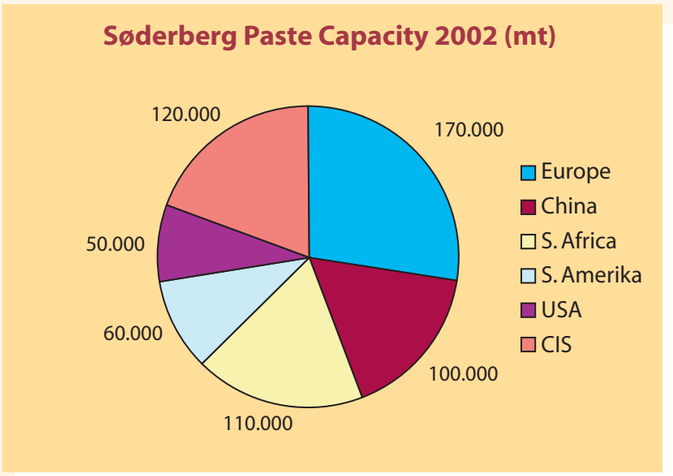
Mr D. Damiotti,
SGL Carbon Group,
chairman

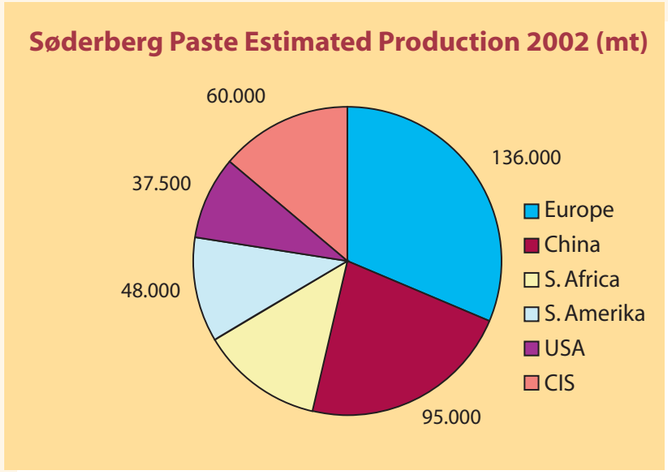
3.3 Silicon

Participating members: Dr R. Becker (Aluminium Rheinfelden GmbH), Mr K. Lenda (Elkem ASA Carbon), Mr S. Sawatzki (ERFTCARBON GmbH)

Søderberg paste

The Søderberg paste consists of calcined anthracite mixed with liquid pitch as a binder, the Søderberg paste is mainly used in the ferro-alloys, phosphorus, and SI-Met productions. The invention of the so-called "self-baking electrodes" using paste has been named after Carl Wilhelm Søderberg, who first had the idea of this kind of electrodes in the year 1910.
The main function of the Søderberg electrodes is to serve as an electric conductor from the transformer to the melting area in the furnaces. The current flow is forming an electrical arc at the tip of the electrodes, which creates the necessary heat, needed for the metallurgical reaction. Each ferro-alloy has a different heat reaction. To be able to form the self-backing electrodes on the furnaces, the Søderberg paste is introduced into a cylindrical steel casing and using the heats coming from the melting bath inside the furnace the Søderberg paste can be baked and become a solid carbon electrode. This process starts at the temperature of 500°C and is completed at approx. 900°C.
The invention of the Søderberg paste, followed by technical improvements, has created the basis for the modern ferro-alloys industry. Ferro-silicon, silicon-manganese, silicon metal, ferro-chrome, ferro-molybdenum, ferro-nickel are a few examples of the alloys produced with the Søderberg paste.
During the year 2002 our Silicon Committee has analysed the worldwide market of the Søderberg paste in terms of production /capacity (see chart).





Silicon metal

The silicon metal market highlights in the year 2002.
Antidumping duties in the USA against Russia and China have created an unbalanced demand supply with prices moving ahead. European weakness persisted with chemical grade demand of silicon on the low level. China drives the global silicon production and is now representing 1/3 of the total silicon production. The silicon committee has focused its activity in the year 2002 at the Chinese market, analysing the production cost, the silicon quality, the major Chinese players in the production and the short and long term impact for the carbon electrodes and Søderberg paste producer.

- 16 bigger companies produce 100 kt of SiMet.
- Other 200 small companies produce 200K of SiMet.
- Chinese SiMet capacity estimated to be 1 million MT.
- Due to lower price and limited by the small diameter size, they use domestic GE electrodes.
- Chinese domestic demand of silicon metal will increase in the next years for chemical and metallurgical grade.

Japanese silicon metal consumption rose in the year 2002 boosted by higher secondary aluminium production supplied mainly by the chinese producers.

Outlook for 2003

Power shortages in Scandinavia and other areas like China are negatively impacting both ferroalloys and silicon metal production output, with lack of power supplies prompting smelter closures, once again showing that the energy cost is the key factor in this industry. Therefore one of the main objectives of our committee in the year 2003 will be to analyse the worldwide energy cost factors divided by country and application.

4. The versatile raw material - petroleum coke

Mr P. Higgins
Manager, Specialty Petroleum Coke – Europe
ConocoPhillips (U.K.) Limited, London

Introduction

In 2002, ConocoPhillips joined the ECGA as an Associate Member. ConocoPhillips is the world's leading producer of the full range of carbon products in the form of calcined petroleum coke. This article briefly describes the various forms of petroleum coke and their use.

Background

Much of the general public's awareness about carbon is rather negative, resolving as it does around its reputation as a contributor to global warming in the form of carbon dioxide. In this article, I would like to offer a counterbalancing argument. I will briefly describe one form of carbon – calcined petroleum coke – and its key role as an essential (and in many cases, non-substitutable) element in a number of key metallurgical industries that contribute to the current standard of living we all enjoy in the developed world. Such industries include aluminium, steel, silicon and ferroalloys.

Carbon is one of the most fascinating elements because of its wide variety of structural forms. These range from exotic nanotubes, to the rigid tetrahedron structure of diamond, one of the hardest materials found on the earth, to the planar hexagonal form associated with graphite. Most forms of carbon have excellent thermal and electrical conductivity which are critical in many of its industrial applications.

Calcined Petroleum Cokes

Calcined petroleum coke is produced by the thermal cracking of heavy oils derived from the processing of petroleum (crude oil). ConocoPhillips is the largest producer of such specialty cokes, having production facilities in both the USA and in Europe.

A regular (anode) grade coke is produced by the high temperature processing of heavy vacuum residual oils in a delayed coker as shown in Figure 1. This operation yields a product known as green (raw) coke. This green coke is then "roasted" or calcined in a rotary kiln (See Figure 2) to remove the moisture and volatile matter. It also converts the petroleum coke into a sponge-like (amorphous) structure. Mostly used in the aluminium industry, the calcined coke is mixed with a pitch derived from coal tar distillation, formed into a block and then baked at high temperature to carbonise the pitch. Such pre-baked anode blocks are used to conduct the high direct current required for the electrolytic production of aluminium metal from alumina (aluminium oxide). The carbon is consumed as a reductant in the process at about 0.4 metric tons per metric ton of aluminium produced. In an older technology for aluminium production - the Søderberg process – the anodes are formed by mixing the coke with pitch to form a paste which is baked in situ during the electrolytic process.

Coking plant

A high quality needle grade petroleum coke is a key raw material for graphite electrode manufacture. Such electrodes are used in the electric arc furnace (EAF) process for the recycling of scrap (and other ferrous materials) to produce steel. Again carbon plays a key role. The graphite electrodes are used to conduct electrical power which creates an arc and thereby melts the scrap raw material. There is no substitute for graphite electrodes in this process and in turn, there is no substitute for needle grade cokes for today's high severity industry. The carbon is consumed by oxidation, typically at 2 to 3 kg per metric ton of steel produced.

Needle cokes are produced in a similar process to that used for aluminium grade anode cokes though specific feedstock selection, processing and operating conditions are necessary to ensure the required properties of the calcined coke are obtained. In particular, a low coefficient of thermal expansion, a high strength and low electrical resisitivity are key attributes to ensure the graphite electrodes can withstand the high thermal and mechanical stresses associated with the operation of an EAF. A range of products is manufactured to suit the number of different markets and operating severity of the furnaces throughout the world.

Another key application for various petroleum cokes is as a recarburiser (carbon raiser) for the steel and foundry industries. These industries require a wide variety of grades of carbon depending upon the specific iron and steel products. Some applications require a very low sulphur and nitrogen content, whilst other products can accept a product similar to a standard European regular grade coke. Careful selection and processing of certain feedstocks are necessary to suit the different market applications.

In the primary aluminium industry, a cathode is also required to complete the electrical circuit for the electrolysis of alumina. Traditionally, such cathodes have been produced from a calcined anthracite (coal based) product. However, recent increases in current amperage and efficiency have required a product with lower electrical resisitivity. Such cathodes can be semi-graphitic, graphitic or fully graphitised and calcined petroleum cokes are increasingly used to provide the necessary electrical properties in such higher severity aluminium smelters.

The carbon and graphite industry also produces a wide range of specialty products including carbon brushes, crucibles, heating elements and process equipment such as heat exchangers. Petroleum cokes are frequently used in such applications – generally products with a more isotropic structure in order to facilitate a fine grain structure required for such specialty applications. Other market applications for calcined petroleum cokes are the phosphorus and titanium dioxide industries.

As the major producer of a wide range of calcined cokes in Europe, ConocoPhillips is pleased to have been invited to join the ECGA where we hope to contribute to the discussions on the future market outlook and carbon raw materials requirements of the industries represented in the Association.

Calcining plant

5. International relations

5.1 Joint meeting JCA/NEMA/ECGA/, Brussels March 4/5, 2002

On 4 and 5 March 2002 ECGA organised a joint meeting with members of NEMA (National Electrical Manufacturers Association, including carbon and graphite products, USA) and JCA (Japanese Carbon Association).

During the meeting the groups exchanged information on Environment, Health and Safety issues in Japan, USA and Europe. General tendencies such as Sustainable Development and Agenda 21 (Rio Summit) were discussed. The exchange of information on the application of Environmental Management Systems like certification and auditing was highly appreciated by all participants. Comparison of the systems revealed substantial differences between the different parts of the world. The same holds true for the concept of standards and BAT.

In the USA Maximum Achievable Control Technology (MACT) Standards were applied while Europe knew the Best Available Technology concept, a part of the Integrated Pollution Prevention Control (IPPC) directive.

Other subjects discussed were climate change, emission trading and "bubble concept". The exchange on energy policy issues was considered to be very valuable since energy was a key driver in the sector.

(from left to right Mr R. Shigematsu (JCA), Dr G. Rose (ECGA), Mr D. Brigman (NEMA)

With great interest the ECGA members also learned about the international standardisation ongoing between JCA and NEMA. This new effort of standardisation now includes the 750 mm electrode and changes to the metric system.

One of the potential future cooperation was also identified when discussing safety statistics and silica exposure. The exchange of key figures for the sector from all three associations on energy, environmental and safety performance in order to provide a coherent picture of the sector around the world was discussed.

The exchange of information on current policies and legislation was found very useful and it was felt that this exercise should be repeated on a regular basis. The Japanese Carbon Association proposed to organise a similar meeting in Japan in 2003.

5.2 EU/China seminar: The new trade and investment environment, and its impact for raw material and primary industry

Mid April 2002 ECGA organised together with its lawyers Gide Loyrette Nouel a seminar on China. China is an important country for the carbon and graphite industry since 40% of the silicon production and 16% of the steel production is destined for China.

(from left to right Mr Liu Youhou, Mr Dominique Voillemot (Gide Loyrette) and Mr. Gang Deng)

Mr Liu Youhou, Minister Counsellor, Mission of the PRC to the EU gave a presentation on trade and investment after China's accession to WTO. Mr Gang Deng, the Vice-Chairman Member of CCCMC, Deputy General Manager China Minmetals Non-ferrous Metals Co. Ltd, gave an industry overview of raw materials in China. He focussed on iron and steel as well as on non-ferrous metals.

China is not only the biggest iron and crude steel exporter in the world; the country also exports finished products. The non-ferrous metal industry is one of the fastest growing industries in China. In this case too the market of finished products is growing considerably.

The European Commission was represented by Mr Peter Klein, Head of Unit of DG Trade, who highlighted some issues on trade with China and what was essential to know from the EU perspective. This presentation was completed with presentations containing legal advice from Me Olivier Prost and Me Charles Henri-Leger, for doing business in China. The proceedings of the seminar are available on the ECGA website.

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