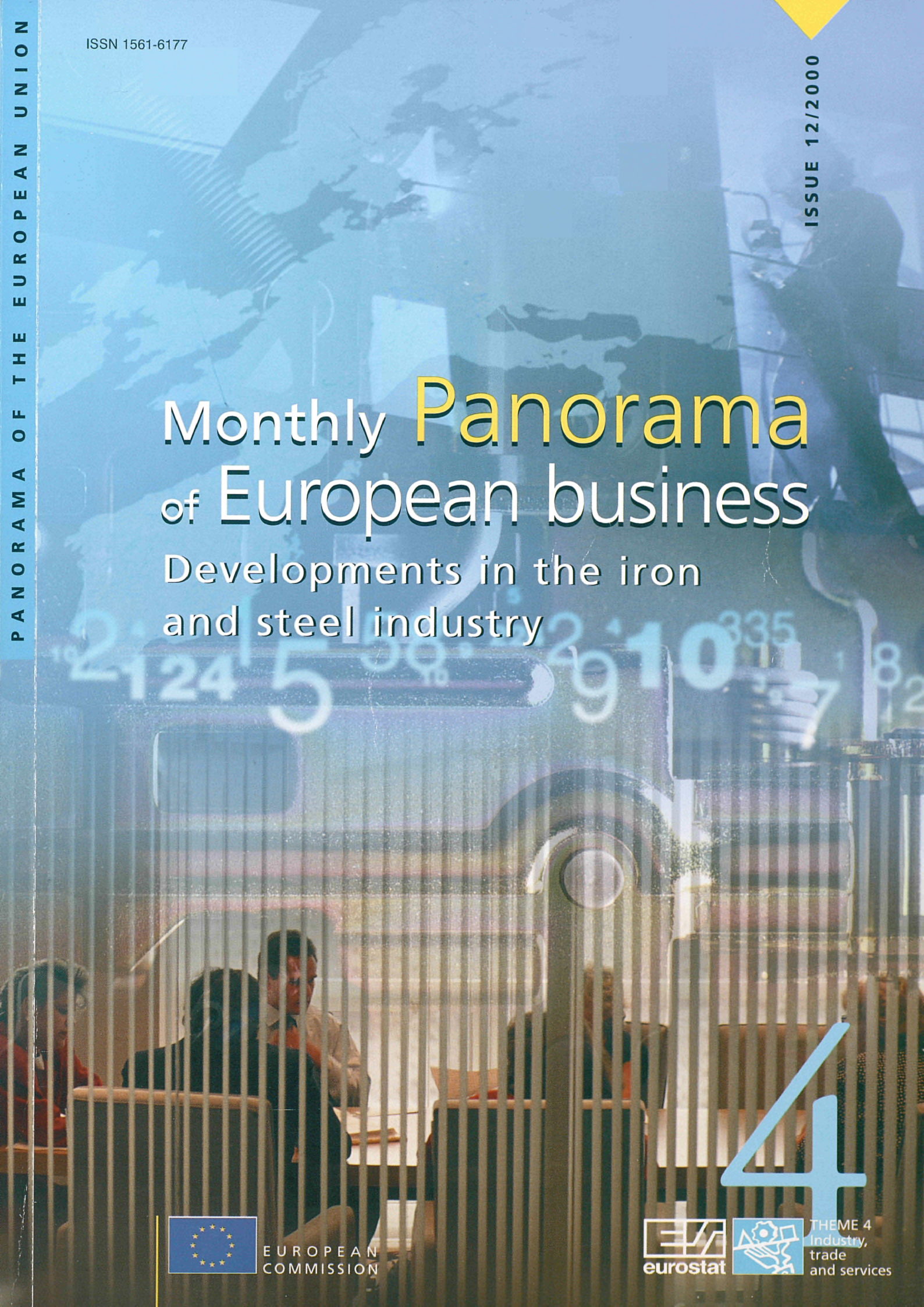
ISSN 1561-6177

PANORAMA OF THE EUROPEAN UNION

ISSUE 12/2000

Monthly Panorama of European business

Developments in the iron and steel industry



EUROPEAN COMMISSION

eurostat

4 THEME 4 Industry, trade and services

.....Our mission is to provide the **European Union** with a **high-quality statistical information service**

Eurostat's collections are adapted to the needs of all users.
You will find them in each of the nine themes proposed by Eurostat.


1 General statistics


2 Economy and finance


3 Population and social conditions


4 Industry, trade and services


5 Agriculture and fisheries


6 External trade


7 Transport


8 Environment and energy


9 Research and development

Graphs · Tables · Comments · Maps	Content	Format
Press releases: Eurostat publishes around 100 press releases every year in connection with the release of new data. The press releases include the key figures or the EU, the Member States and their partners. They are provided free of charge. They are also available on the Internet as soon as they are published: www.europa.eu.int/comm/eurostat/		Paper Html PDF
Statistics in focus: This collection is published regularly by Eurostat and provides up-to-date summaries of the main results of statistical surveys, studies and analyses. It covers all themes and consists of about four to eight pages per issue. Eurostat issues around 150 *Statistics in Focus* per year. Available as single copies or on subscription.		Paper PDF
Key indicators: This collection provides the main indicators on a theme or sub-theme in an easy-to-carry booklet of up to 100 pages. Available as single copies or on subscription.		Paper Html
Panorama of the European Union: This collection highlights the features and trends of a multi-sectoral theme or a sectoral sub-theme. The publications consist of around 200 pages and include analysis as well as tables and graphs. Available as single copies or on subscription.		Paper CD-ROM
Methods and nomenclatures are intended for specialists who want to consult the methodologies and nomenclatures used for a theme, a sub-theme or a sector. Available as single copies.		Paper CD-ROM
Detailed tables are intended for specialists. They present part, or all, of the statistical data compiled on a theme, sub-theme or sector. Available as single copies or on subscription.		Paper CD-ROM
Studies and research summarise the results of European statistical studies and research and are intended for specialists. Available as single copies or on subscription.		Paper CD-ROM
Catalogues provide rapid access to concise information on Eurostat's products and services. They are free of charge and include the *Mini guide*, a selection of Eurostat products and services, and *Statistical references*, the quarterly newsletter on Eurostat's latest products and services.		Paper

ISSUE 12/2000

Monthly Panorama of European business

Developments in the iron and steel industry

4

EUROPEAN COMMISSION

eurostat

THEME 4
Industry, trade and services

..... Immediate access to harmonized statistical data

Eurostat Data Shops:

A personalised data retrieval service

In order to provide the greatest possible number of people with access to high-quality statistical information, Eurostat has developed an extensive network of Data Shops (1).

Data Shops provide a wide range of **tailor-made services**:

- ★ immediate information searches undertaken by a team of experts in European statistics;
- ★ rapid and personalised response that takes account of the specified search requirements and intended use;
- ★ a choice of data carrier depending on the type of information required.

Information can be requested by phone, mail, fax or e-mail.

(1) See list of Eurostat Data Shops at the end of the publication.

Internet:

Essentials on Community statistical news

- ★ Euro indicators: more than 100 indicators on the euro-zone; harmonized, comparable, and free of charge;
- ★ About Eurostat: what it does and how it works;
- ★ Products and databases: a detailed description of what Eurostat has to offer;
- ★ Indicators on the European Union: Convergence criteria; euro yield curve and further main indicators on the European Union at your disposal;
- ★ Press releases: direct access to all Eurostat press releases.

For further information, visit us on the Internet at: www.europa.eu.int/comm/eurostat/

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (http://europa.eu.int).

Luxembourg: Office for Official Publications of the European Communities, 2000

ISSN 1561-6177

Printed in France

PRINTED ON WHITE CHLORINE-FREE PAPER

EUROSTAT

L-2920 Luxembourg — Tel. (352) 43 01-1 — Telex COMEUR LU 3423
Rue de la Loi 200, B-1049 Bruxelles — Tel. (32-2) 299 11 11

Eurostat is the Statistical Office of the European Communities. Its task is to provide the European Union with statistics at a European level, that allow comparisons to be made between countries and regions. Eurostat consolidates and harmonizes the data collected by the Member States.

To ensure that the vast quantity of accessible data is made widely available, and to help each user make proper use of the information, Eurostat has set up a publications and services programme.

This programme makes a clear distinction between general and specialist users and particular collections have been developed for these different groups. The collections *Press releases*, *Statistics in focus*, *Panorama of the European Union*, *Key indicators* and *Catalogues* are aimed at general users. They give immediate key information through analyses, tables, graphs and maps.

The collections *Methods and nomenclatures*, *Detailed tables* and *Studies and research* suit the needs of the specialist who is prepared to spend more time analysing and using very detailed information and tables.

All Eurostat products are disseminated through the Data Shop network or the sales agents of the Office for Official Publications of the European Communities. Data Shops are available in 12 of the 15 Member States as well as in Switzerland, Norway and the United States. They provide a wide range of services from simple database extracts to tailor-made investigations. The information is provided on paper and/or in electronic form via e-mail, on diskette or CD-ROM.

As part of the new programme Eurostat has developed its website. It includes a broad range of on-line information on Eurostat products and services, newsletters, catalogues, on-line publications as well as indicators on the euro-zone.

Yves Franchet
Director-General

Editorial

This special issue focuses on aspects of the steel industry. The first section examines the supply of steel, describes the technology of steel production and explains how technological changes have impacted on the consumption of raw materials.

The second section examines the structure of the market for steel and discusses some methodological aspects relating to the measurement of steel consumption, which reflects the economic importance of steel. It also demonstrates the impact which technological progress has had on steel consumption.

The third section looks at the market for steel in greater depth, focusing on the tubes industry, one of the most important areas in the primary transformation of steel.

The final section looks at steel consumption by user branch from a historical perspective (1974-1995). The main steel consuming branches are treated in the analysis, with a description of consumption trends over a twenty year period.

Pedro Díaz Muñoz,
Luxembourg

Description of the activity - iron and steel, NACE Rev. 1 27.10, page 5

Current trends, page 23

The steel tubes industry, page 37

Steel consumption by user branch in the European Union (1974-1995), page 45

Contents

The Monthly Panorama of European Business has the objective of furnishing readers with an instrument which will allow them to follow the evolution of short-term trends and also show the structure and activity of European business. The publication appears eleven times during the course of the year. When the occasion warrants topical articles may well be treated in the form of a special edition.

This publication is a project of Eurostat unit D3.
The opinions expressed in this publication are those of the individual authors alone and do not necessarily reflect the position of the European Commission.

Editor-in-chief:
Mr. Gunter Schäfer,
Eurostat,
Statistical Office of the European Communities,
Bâtiment Joseph Bech,
E2/808,
L-2721 Luxembourg
tel: (352) 4301 33566
fax: (352) 4301 34359
e-mail: gunter.schaefer@cec.eu.int

For further information on steel:
Mr. Hans-Werner Schmidt,
Eurostat,
Statistical Office of the European Communities,
Bâtiment Joseph Bech,
E2/819,
L-2721 Luxembourg
tel: (352) 4301 34087
fax: (352) 4301 34359
e-mail:
hanswerner.schmidt@cec.eu.int

Analysis and data processing:
Vlemmings consulting

Desktop publishing:
INFORMA sàrl
Laurence Bastin, Andrew Redpath

Enquiries regarding the purchase of data should be directed to:
Eurostat Data-Shop
4, rue Alphonse Weicker
L-2721 Luxembourg
tel: (352) 43 35 22 51
fax: (352) 43 35 22 221
e-mail: dslux@eurostat.datashop.lu

1. Description of the activity: iron and steel, NACE Rev. 1 27.10

1. Description of the activity: iron and steel, NACE Rev. 1 27.10

For the purposes of this section, the term "steel industry" means the industry as defined in the Treaty of Rome. NACE Rev. 1, 27.10 is also based on this definition.

According to this definition, production includes the manufacture of ferro alloys. More than 99% of all produced iron is processed in the steel industry. The products sold by the steel industry are intermediate products, 35% of which are used in industries involved in the primary processing of steel, the manufacture of steel tubes, pressing, stamping, wire drawing and cold forming and cold rolling, etc.

Steel as a material

Although iron and steel were not the first materials to be used by mankind, it has long been the most commonly used material. There are two reasons for this: firstly, the sheer abundance of iron ore, 5% of the earth's crust is made of iron and secondly, steel's high value/cost ratio compared with that of other materials.

This relatively low cost price should not be taken for granted: as steel making is not a simple process. The temperature required to reduce iron ore is much higher than that needed for reducing other metals such as lead, tin or copper, which is why these metals found their way into human history earlier.

In the course of its long history, steel making has been characterised by a constant flow of innovations in process and product technology. These innovations have brought about reductions in the relative price of steel, and sometimes even in its absolute price.

Enquiries regarding the purchase of data should be directed to:

Eurostat Data-Shop
4, rue Alphonse Weicker
L-2721 Luxembourg
tel: (352) 43 35 22 51
fax: (352) 43 35 22 221
e-mail: dslux@eurostat.datashop.lu

This trend can be shown to good effect if we compare data covering a very extensive period. Throughout the 17th century, the price of a tonne of iron fluctuated around the price of 3kg of silver or 200g of gold. Today, 1,000kg of iron costs less than 1kg of silver and the current price of steel, despite the much superior quality of the modern product, is just two to ten times that of the pig iron. Much of the fall in the real price of steel is due to the industrial revolution: detailed studies have shown that the real price of a number of steel products in France fell by more than 60% in the second half of the 19th century[1].

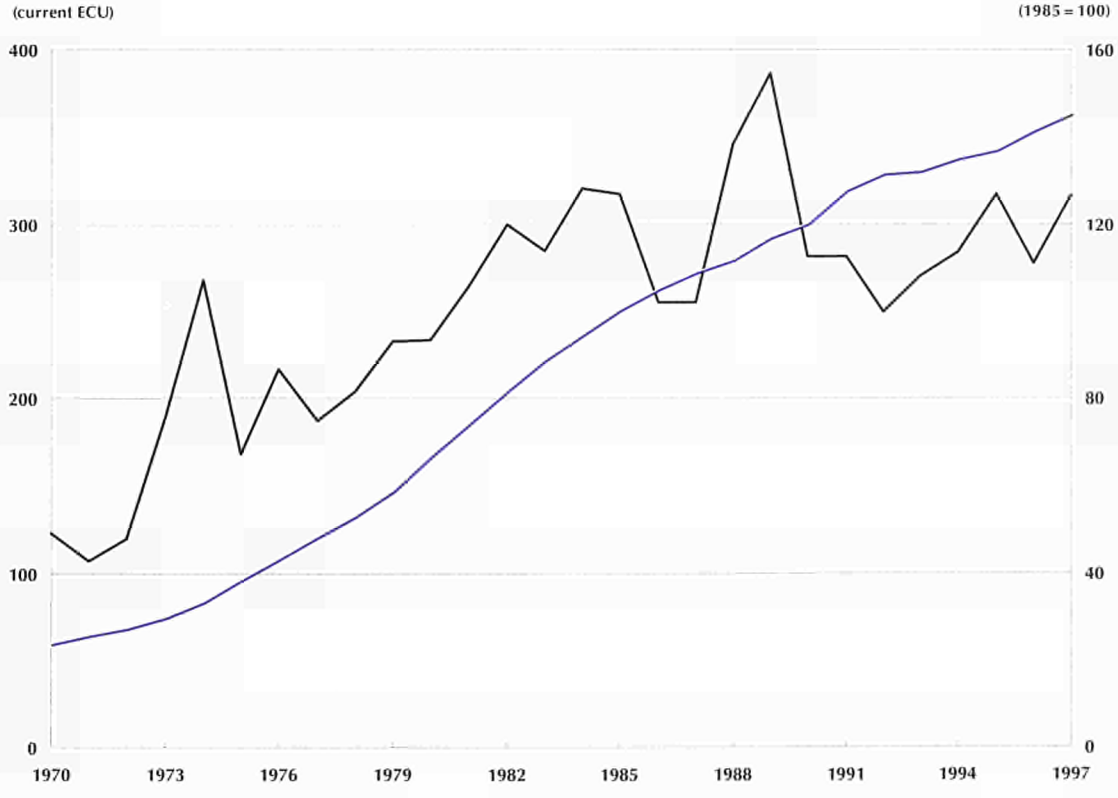
(1) J. Fourastié, "L'évolution des prix à long terme", Paris, 1969.

The downward trend in real prices can also be demonstrated for shorter periods. Although the cyclical character of steel prices and high levels of general inflation, particularly in the 1970s and 1980s make it difficult to compare prices from one year to the next, a comparison of successive peaks and troughs suggests that even nominal prices have fallen since the beginning of the 1970s. In real terms, steel prices have fallen by 65% since that period, equivalent to a reduction of slightly more than 4% per year.

The last three decades have therefore witnessed an improvement in production efficiency comparable to that in the industrial revolution.

Figure 1.1

Long-term changes in steel prices, 1970-1997



Source: eurostat

The technology of making steel

Two different processes currently form the basis for nearly all steel production. In 1952, the year in which the European Coal and Steel Community (ECSC) came into being, the oxygen steel making process and electric arc steel making accounted for 0.0% and 8.2% respectively of steel production.

These processes differ not only in terms of technology but also with regard to their use of raw materials and, to some extent, the type of product. The processes are therefore partly in competition with one another and partly complementary.

Oxygen steel making, or the integrated steel process, involves reducing the iron ore to iron in the blast furnace, and removing the carbon locked in the iron. This is done in an oxygen steel converter.

The electric arc process involves melting the steel in an electric arc furnace. The steel is usually input in the form of scrap, although direct reduced iron, or DRI, can also be used. The direct reduction of iron ore is made possible by the use of natural gas in combination with the Midrex or Hyl III process. Production of DRI is limited to about 23 million tonnes (compared with world output of blast furnace pig iron of more than 500 million tonnes), mainly in regions benefiting from structurally low energy prices. This is why steel scrap is the most important raw material for electric furnaces in the EU.

Oxygen steel converters generally have a production capacity of more than 100 tonnes per heat. Of 97 installations in the EU in 1993, only 17 had a production capacity of less than 100 tonnes per heat. The average capacity per heat was 204 tonnes. Electric arc furnaces, by contrast, have a capacity of less than 100 tonnes per heat (usually between 40 and 100 tonnes). Just 56 of the 274 electric furnaces in production in 1993 had a capacity of more than 100 tonnes, and 66 had a capacity of less than 20 tonnes. The average capacity per heat of electric furnaces was 62 tonnes.

Because of the higher number of heats per day, the average capacity of an oxygen steel mill in 1993 was 3.36 million tonnes per year, compared with 0.29 million tonnes in the case of electric steel mills. There is a clear trend towards bigger installations. The smaller installations of both types are usually the oldest, which does not mean that the biggest plants are always the most modern.

The total capacity of oxygen steel mills in 1995 was 124 million tonnes, and that of electric furnaces 81 million tonnes. Their respective production figures were 101 million and 55 million tonnes and their capacity utilisation rates 81.5% and 67.5%.

The difference in capacity utilisation partly reflects differences in flexibility. Whereas an electric furnace is usually taken out of production during holiday periods, the continuous character of the blast furnace process is such that integrated steel production can only fluctuate within fairly narrow limits. A complete production campaign of a blast furnace lasts eight years or more. The entire furnace then has to be closed down for relining, after which a new eight-year cycle can begin.

The greater flexibility, smaller production capacity and resultant lower capital costs of the electric steel process give it a competitive edge, which is why electric steel mills now account for almost the entire output of light sections and comparable products. In the case of flat products, on the other hand, the hot strip mill is of crucial importance for optimum production capacity. The 25 wide strip rolling mills in production in 1993 together produced 56 million tonnes, or more than 2 million tonnes per installation. The capacity of an electric steel mill is generally too limited for it to be continually fed with sufficient material. Integrated oxygen steel mills are therefore regarded as better suited for the production of flats. Thin slab casting, or near net-shape casting, is a recently developed production process which enables rolling mills to dispense with some mechanical operations. This

means that in future, the capacity of wide strip rolling installations will no longer be the crucial factor determining the choice of either blast furnace, oxygen steel mill or electric furnace.

The narrower scope of production and slower, but accordingly more easily regulated production process, has led to a preference for the electric steel process for stainless steel and other special steel alloys, a sector in which blast furnaces provide hardly any competition at all.

Raw materials used in steel production

Iron ore

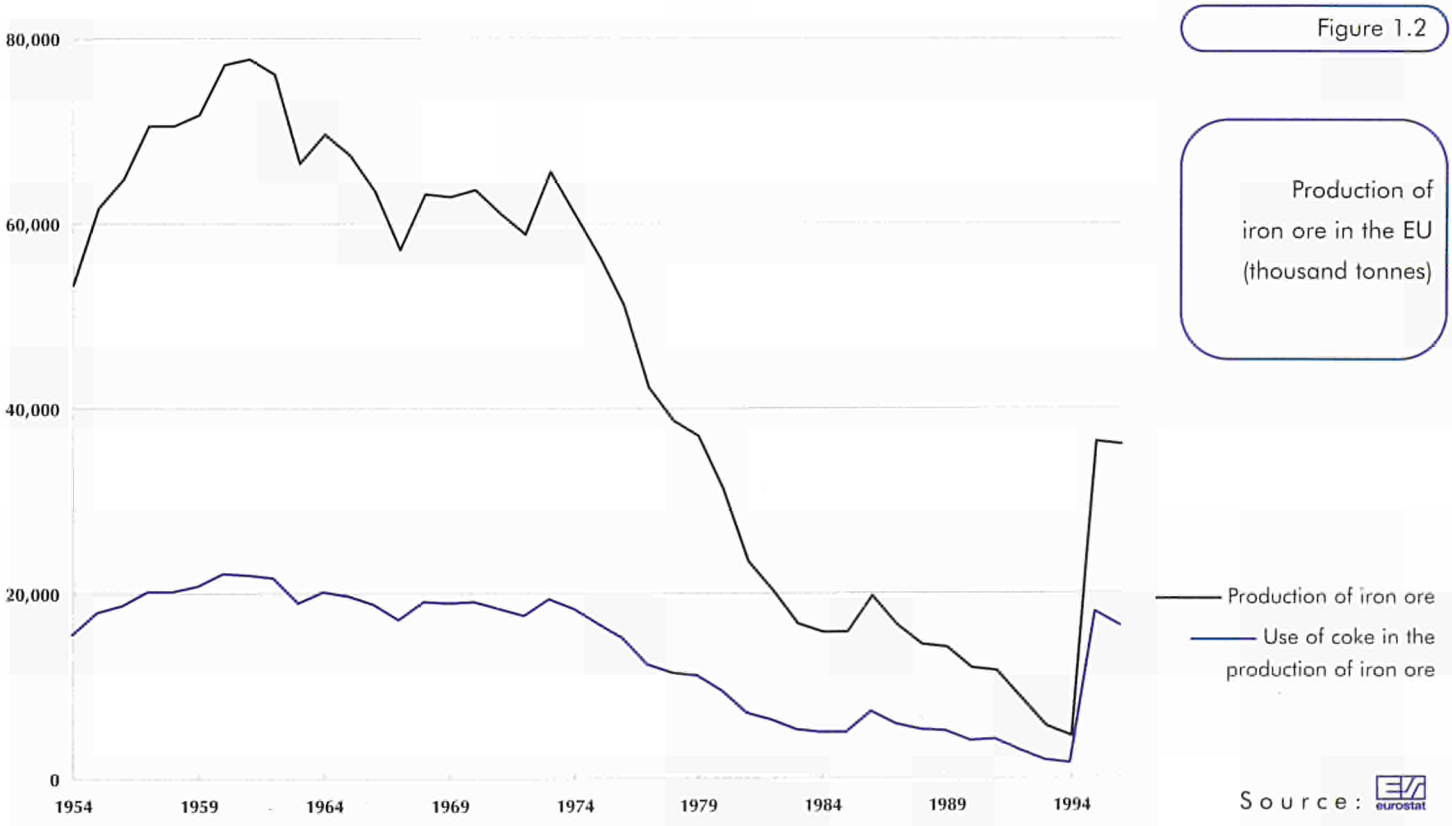
The difference in the technology used in these two steel production processes also affects the raw materials used. The most important raw material for the integrated blast furnace is iron ore, which is used in the form of lump, sintered or pelletized ore.

The market for iron ore has seen some fundamental changes. Consumption of iron ore in the original ECSC (the original six Member States) in 1954 was 72 million tonnes, which yielded 33 million tonnes of pig iron (2,150kg of ore per tonne of pig iron). This quantity had fallen to 1,520kg/tonne by 1995.

This reduction was made possible by the use of iron ore with a higher Fe-content, but also by means of ore preparation. Of the 72 million tonnes of iron ore used in 1954, 61 million tonnes (85%) was produced within EU-6, and only 15% was imported, mainly from Sweden, Spain and North Africa. Only 25% of this ore was used in the form of sintered ore. The sintering of ore came to dominate because ore with a low Fe-content could be used once the ore had been broken into smaller pieces, but also because of the energy savings. In particular, a more homogeneous input into furnaces meant that coke could be saved.

Figure 1.2

Production of iron ore in the EU (thousand tonnes)

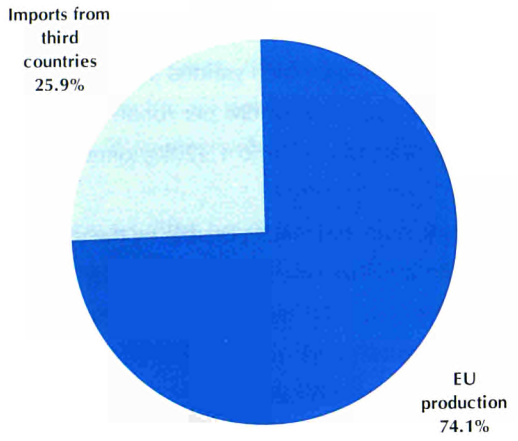


Source: eurostat

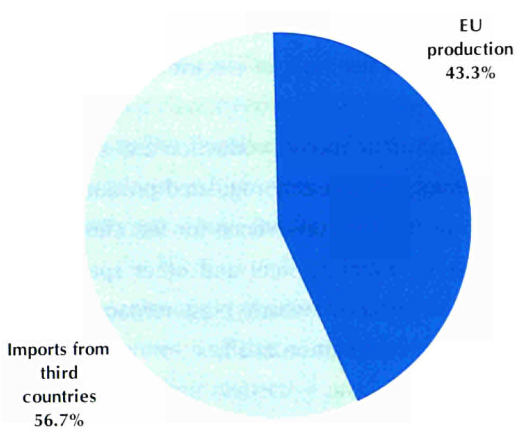
Figure 1.3

Origin of the iron ore consumed in the EU

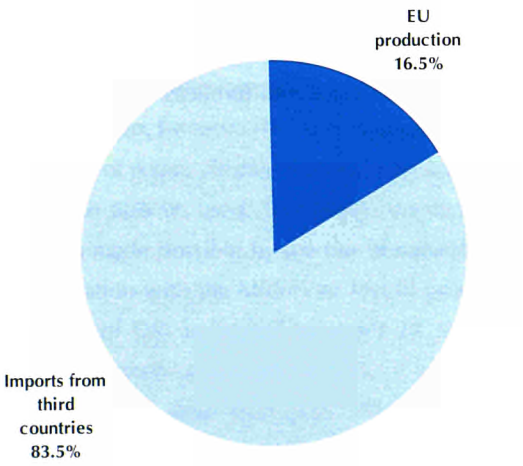
1954



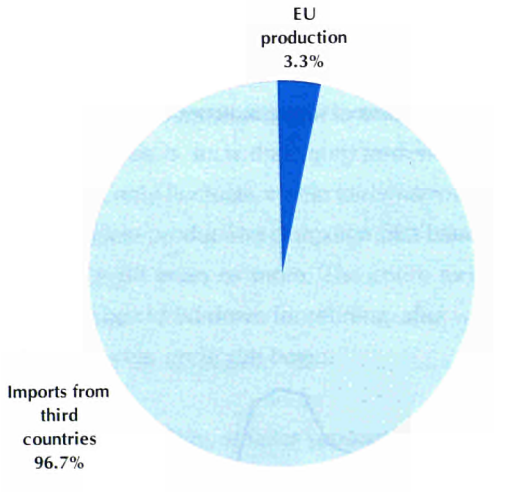
1970



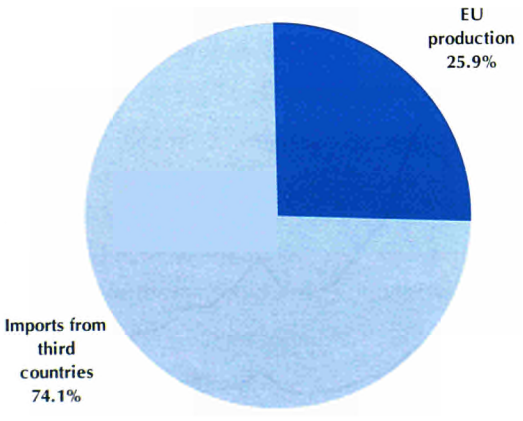
1985



1994



1996



Source: eurostat

Table 1.1

Origin of iron ore consumption in the EU (million tonnes)

	1954	(%)		1996	(%)
Imports from third countries (mainly from Sweden and Spain)	18,635	25.9	**Total**	105,451	74.5
			Russia	1,131	0.8
			Mauritania	10,332	7.3
			South Africa	4,858	3.4
			USA	71	0.1
			Canada	14,088	9.9
			Venezuela	4,719	3.3
			Brazil	43,782	30.9
			Australia	19,388	13.7
			Other	7,082	5.0
EU production	53,349	74.1		36,152	25.5
EU consumption	71,984	100.0		141,603	100.0

Source: eurostat

Iron ore output in the ECSC reached a peak of 96 million tonnes in 1961. It then declined to 71 million tonnes in 1970 and 33 million tonnes by 1980. Output remained stable at around 16 million tonnes in the 1980s, but in recent years has again been declining, to stand at 3 million tonnes for EU-12. Now that Sweden is a Member State of the EU, output has again risen, and now stands at 27 million tonnes. Most of the EU's demand for iron ore is met from imports.

The changes which have taken place in the supply of iron ore to the EU's steel industry were necessitated by the differences in quality (Fe-content) in European and imported ores, but were only possible thanks to structural changes in the transport sector.

Scrap

The second most important raw material for steel production is steel scrap, which is mainly used in electric furnaces, but also in oxygen steel mills. Total consumption of scrap in the EU is 74 million tonnes (1995), 56 million tonnes (77%) of which goes into electric steel production. The other 18 million tonnes is used in oxygen steel mills, whilst only negligible amounts are used in blast furnaces and, occasionally, directly in rolling mills.

The consumption of scrap for the oxygen steel making process depends largely on production practices. Scrap is necessary as a coolant during the process, but now that the refining of steel is increasingly taking place outside the convector (secondary refining), cooling in the convector is less important, and this specific use of scrap has declined by more than 100kg/tonne in the last 20 years, from 284kg/tonne of crude steel in 1974 to 176kg/tonne in 1995.

Table 1.2

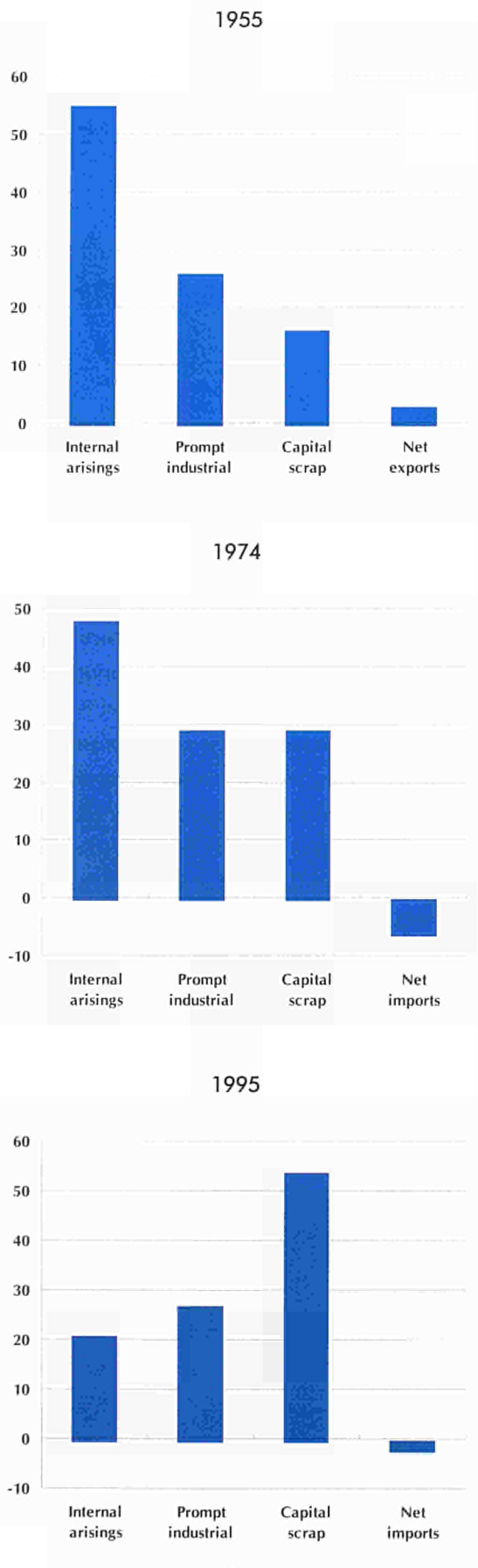
Scrap consumption by source (%)

	1955	1974	1995
Internal arisings	55	48	21
Prompt industrial	26	29	27
Capital scrap	16	29	54
Trade balance	3	-6	-2

Source: eurostat

Figure 1.4

Scrap arisings by source (%)



Source: eurostat

Before the introduction of the oxygen steel making process, most scrap was used in the Siemens-Martin open hearth process, which accounted for 36% of steel output in 1952. This process was no longer used in the EU by the 1980s.

Despite the fundamental changes which have taken place in steel making, overall scrap consumption in the steel industry has changed little. Consumption of scrap per tonne of steel produced using all the existing processes is currently 474kg/tonne, compared with 481kg/tonne in 1955, although the intervening period has seen some major fluctuations.

There have been similar changes on the supply side. Three sources of steel scrap are usually distinguished, although statistical sources do not always make a clear breakdown possible. In the 1950s, the processes employed in the steel industry from steel factory, ingot casting, slabbing and blooming mills and further wide strip mill and other further processing facilities were such that internal arisings were 280kg/tonne of produced steel. Internal arisings made up 55% of total scrap consumption. In 1995, internal arisings accounted for 10.7% of steel production and 21% of scrap consumption.

A second source of scrap is arisings in the steel processing industry, known as prompt industrial scrap. Although improvements in the quality of steel and technical advances have yielded savings in materials, including scrap in a number of steel-processing sectors, it is not possible to identify a clear relationship between industrial scrap arisings and steel consumption. For companies involved in the primary processing of steel, there has been a small increase in specific steel consumption, which in this case means a slight increase in the availability of scrap in relation to the volume of output. This may have been the result of a structural shift in the industry as a whole, but perhaps also the result of changes within individual sectors, e.g. a shift in production from seamless to welded tubes. The same conclusion can be drawn for steel-processing industries as

a whole, in which the share taken by shipbuilding has fallen from 14% to 10%, whilst the share of the car industry has continued to rise, from 26% to 36%. The net result was a fall in scrap arisings from 15% of apparent steel consumption at the beginning of the 1950s to 14% by 1974, followed by a slight increase to 14.3% in 1995. As a result, prompt industrial scrap accounted for 26% of total scrap consumption in 1955, 29% in 1974 and 27% in 1995.

The declining availability of internal arisings in the steel industry has been offset by an increase in the availability of capital scrap, i.e. scrap which becomes available when products reach the end of their operating life, such as empty drinks cans, shredded cars and discarded machines. The availability of old scrap, which in 1955 was exactly half that of direct industrial scrap, was equal to the availability of direct industrial scrap in 1974. By 1995, twice as much old scrap was available as direct industrial scrap.

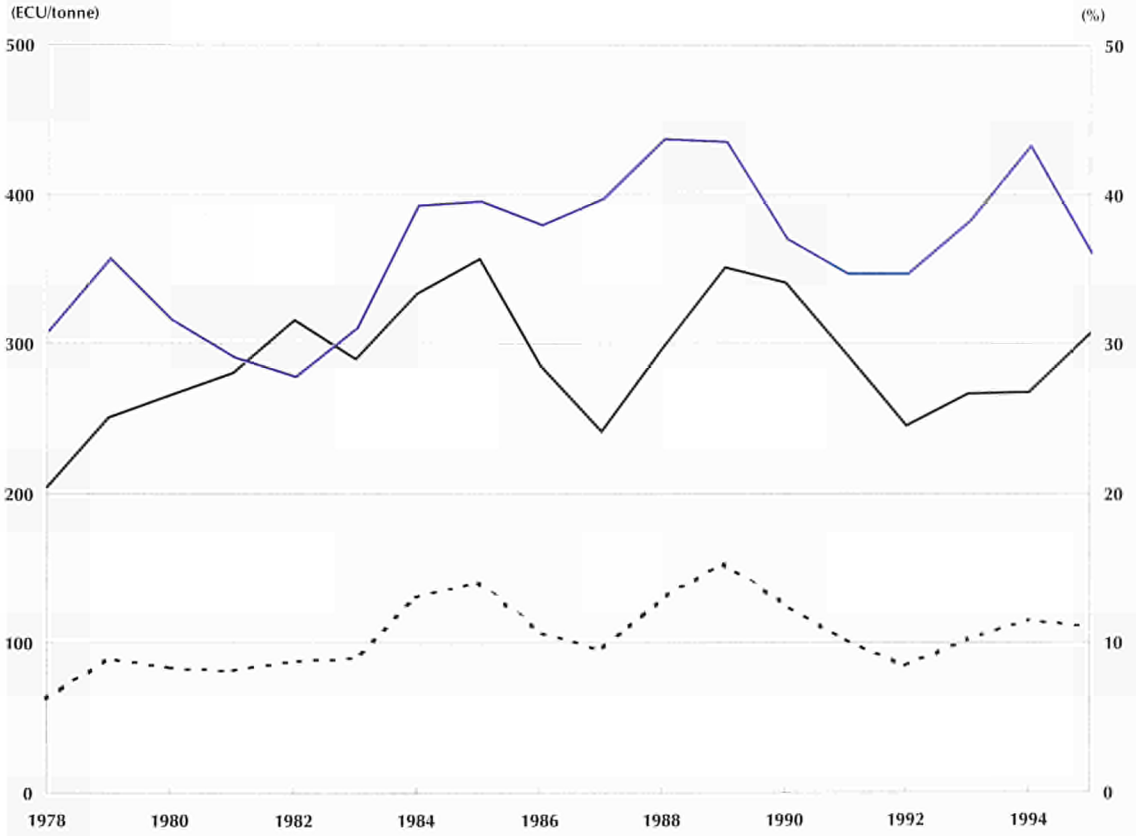
The balance is the difference between net imports/exports of scrap and the consumption of scrap outside the industry, e.g. in iron foundries. The graphics clearly show how the EU has moved from being a net scrap importer to a net exporter.

The explosion in the availability of old scrap was essential if demand was to be met. It was made easier by a growing awareness of the problem of waste disposal. The figures show the high level of recycling within the steel industry.

The data for world trade in scrap underscores the importance of scrap as a raw material in the steel industry. World trade in steel scrap amounts to 40 million tonnes, compared with 238 million tonnes of steel products (both figures include intra-community trade). World trade in scrap is of vital importance for developing countries, which are the main importers. In the absence of sufficient local sources of old steel scrap, scrap has to be imported to bridge the gap between demand and local supply.

Figure 1.5

Average unit value of exports to third countries



Source: eurostat

The importance of scrap as a raw material becomes even clearer if we look at trends in the price of steel scrap.

The price of steel scrap is determined to a large extent by the price of bars, which are mainly produced in electric furnaces. It is even more dependent on market conditions. The average price per tonne of steel scrap exported to non-Member States can reach 45% of the value per tonne of exported steel bars when market conditions are favourable, but can be as low as 27% if the market is depressed.

Energy

The steel industry uses energy in various ways. Coke is essential in blast furnaces. It is used not only as a fuel, but also as a reactive substance. It is produced in coke oven plants. About 68% of the coke is made in coke oven plants, which are integrated in the steel complex. As a fuel, coke can be replaced by injected oil or injected powder coal.

The injection of oil or powder coal in blast furnaces has a major impact on coke consumption in the iron and steel industry. Oil was first injected in 1960. In 1961, 53,000 tonnes was injected, or 1,000 tonnes per million tonnes of iron that was produced. By 1973, the quantity of injected oil had reached 5.5 million tonnes, or 52,000 tonnes per million tonnes of produced iron. Over the same period, the coke rate in blast furnaces declined from 790kg to 533kg/tonne.

Following the oil crisis of 1974, the use of oil injection declined. Total oil consumption in the steel industry fell from 13 million tonnes in 1974 to 4 million tonnes today, after a low of 1.8 million tonnes in 1985.

Coal injection was first used in the 1960s, but could not be described as an important technology until the 1980s. Of the blast furnaces in operation in 1993, 38 out of 81 made use of this technology, which, together with liquid fuel injection, made the largest single contribution to the decline in the volume of coke used in steel production over the last decade.

As coke oven plants cause relatively little environmental pollution, savings on coke consumption have made an important contribution to the steel industry's much improved environmental balance sheet.

Seen in isolation, an oxygen steel mill does not consume much energy. Because of the high carbon content of pig iron, the injection of oxygen creates an endogenous source of heat. Depending on the desired final temperature of the liquid steel, some

Table 1.3

Coke consumption in blast furnaces of iron produced
(kg coke per tonne of iron)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
EU-15	488	469	457	445	428	419	399	395	391	385
F	482	474	446	445	422	421	373	370	358	356
D	484	458	444	442	421	410	397	389	379	380
UK	516	483	466	449	437	433	439	409	405	395

Source: eurostat

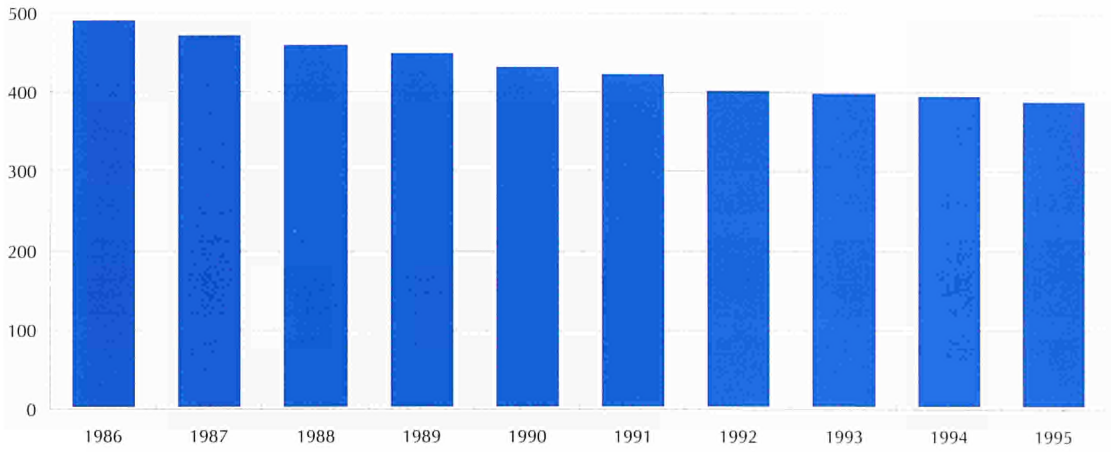


Figure 1.6

Coke consumption in blast furnaces per tonne of iron produced (kg per metric tonne)

Source: eurostat

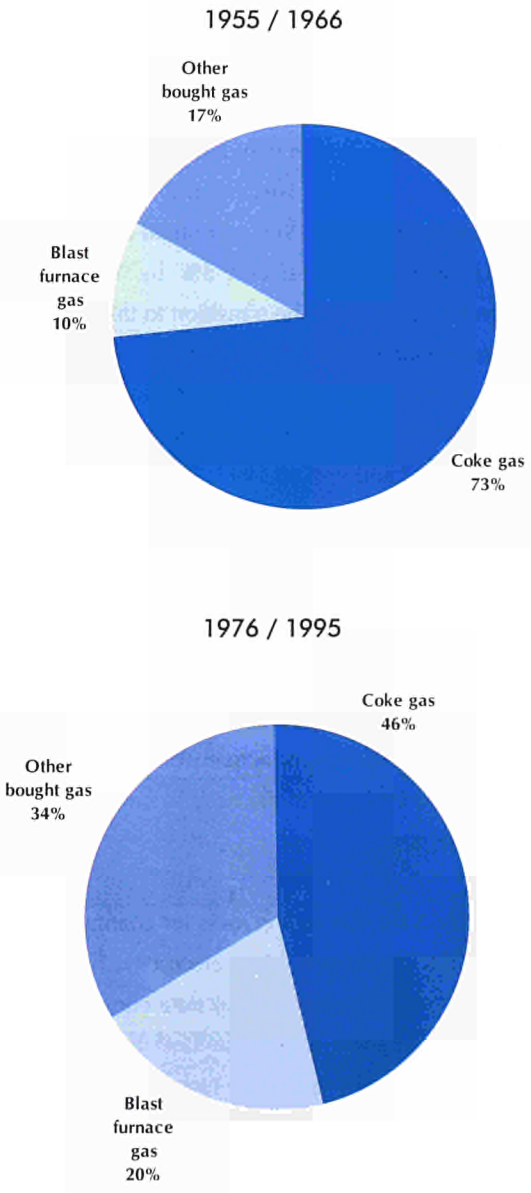
cooling may actually be required. Scrap has proved itself highly suitable as a coolant. The specific energy consumption of an oxygen steel mill varies between -0.5GJ and 1GJ/tonne of crude steel.

A coke oven produces not only coke, but also gas. In addition to coke gas, blast furnace gas is also an important source of internally generated energy for the steel industry. With the calorific value of blast furnace gas fairly low, it has to be used in very close proximity to the blast furnaces. Coke gas, on the other hand, can be sold to external users. Within the steel mill, gas can be used to heat the steel (in reheating furnaces), but is often also used for the production of electricity for the rest of the production process.

The decline in coke consumption and the increased recovery of blast furnace gas have significantly changed the structure of gas consumption in the steel industry. Most of these changes took place between 1966 and 1976. Before and since that period, the structure of gas consumption appears to have been fairly constant, despite all the other changes which have affected the production process.

Figure 1.7

Consumption of gas in the steel industry



Source: eurostat

Table 1.4

Specific energy consumption relating to crude steel production

	1955	1965	1975	1985	1995
Gas consumption:					
GJ/1,000 tonne	13.16	8.02	7.87	5.82	5.18
Electricity:					
kWh/tonne steel	347	373	447	309	247
kWh/tonne EAF-steel	4,052	3,108	2,311	1,357	640

Source: eurostat

The steel industry has already made great strides in energy conservation. A very important contribution to these savings was the introduction of the continuous casting process. This innovation in process technology, which in 1960 accounted for only 1% of EU steel production and 5% by 1970, was extremely successful. The transition to this technology accelerated in the 1970s, particularly in 1979, when its share leapt from 31% to 39% of total steel output. This share continued to increase, reaching 81% by 1987 and 95% in 1997. The redundancy of the slabbing mill made material savings of 15% possible, which in turn led to comparable energy savings. In so far as energy consumption in the steel industry is usually measured on the basis of crude steel production, this energy saving is often ignored. The use of continuous casting has yielded further energy savings, principally on gas consumption, by dispensing with the need to cool and then reheat the steel.

Electricity is used in rolling mills for coating sheets and producing oxygen. Most electricity, however, is used for making electric steel. As a consequence, the increased share of electric steel in total steel production raised the specific electricity consumption measured in terms of total steel production in the period to 1975. Since then, specific consumption has been on the decline. The figures for electricity consumption in relation to electric steel production alone are more telling. Although the figures for the period before 1975 are not representative, because of the share of electric steel production in that period, the figures for the period after 1975 are impressive.

Measuring energy input in the steel industry provides only a partial picture of increased energy efficiency. In addition to lower energy consumption, there has also been a considerable increase in the amount of energy recovered from waste heat generated in the production process.

Technological development

Energy savings in the steel industry have been possible thanks to technological progress in the steel making process. The impact of continuous casting has already been mentioned. The next step will be thin slab casting or near net-shape casting, a technology which will enable the industry to cast considerably thinner steel products than the slabs currently produced. This technology, or at least certain variations on it, only became a commercial proposition a few years ago. Direct product casting promises even greater benefits than the introduction of continuous casting.

Table 1.5

Steel production in the EU (thousand tonnes)

		Production of crude steel in the EU	Production of finished products (1)	Production efficiency (%)
1952	EU-6	41,996	28,515	67.9
1955	EU-6	52,777	36,224	68.6
1960	EU-6	73,076	50,791	69.5
1965	EU-6	85,991	60,367	70.2
1970	EU-6	109,203	79,465	72.8
1975	EU-9	125,560	89,632	71.4
1980	EU-10	127,738	99,182	77.6
1985 (2)	EU-10	120,641	95,723	79.3
1990	EU-12	136,853	116,568	85.2
1995 (3)	EU-15	155,744	134,705	86.5
1996	EU-15	146,597	128,276	87.5

1) 1995: hot rolled products.
2) Has to be confined to the EU-10 as comparable figures for Spain were not available.
3) Because of a change in the underlying statistics, the figure for 1995 is not directly comparable to previous years. Real efficiency may be 0.5% to 1.0% higher.

Source: eurostat

Table 1.6

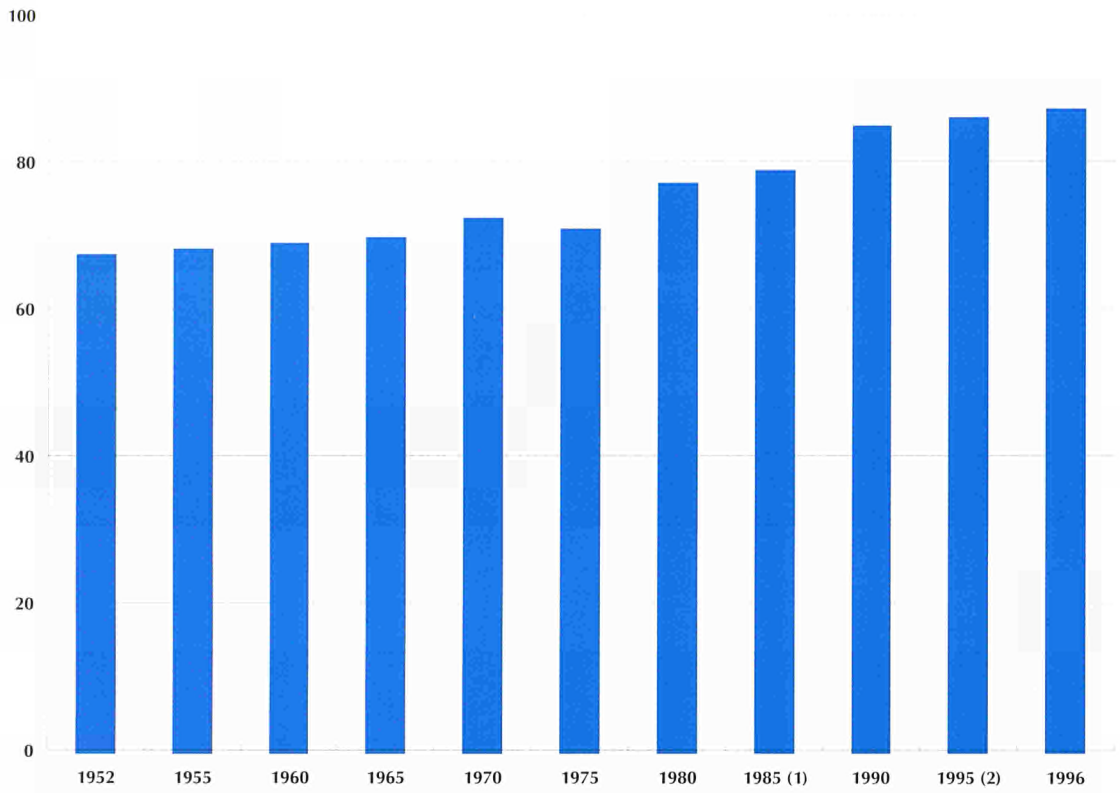
Production, employment and productivity for steel

		Steel production (1,000 tonnes)	Employment (units)	Productivity (tonnes per man)
1954	EU-6	43,961	481,224	91.4
1960	EU-6	73,076	572,313	127.7
1965	EU-6	85,991	580,334	148.2
1970	EU-6	109,203	565,128	193.2
1975	EU-9	125,560	766,356	163.8
1980	EU-10	127,738	597,873	213.7
1985	EU-12	120,653	425,812	283.3
1990	EU-12	136,853	376,838	363.2
1995	EU-15	155,744	314,059	495.9
1996	EU-15	146,597	298,317	491.4

Source: eurostat

Figure 1.8

Production efficiency of steel (%)

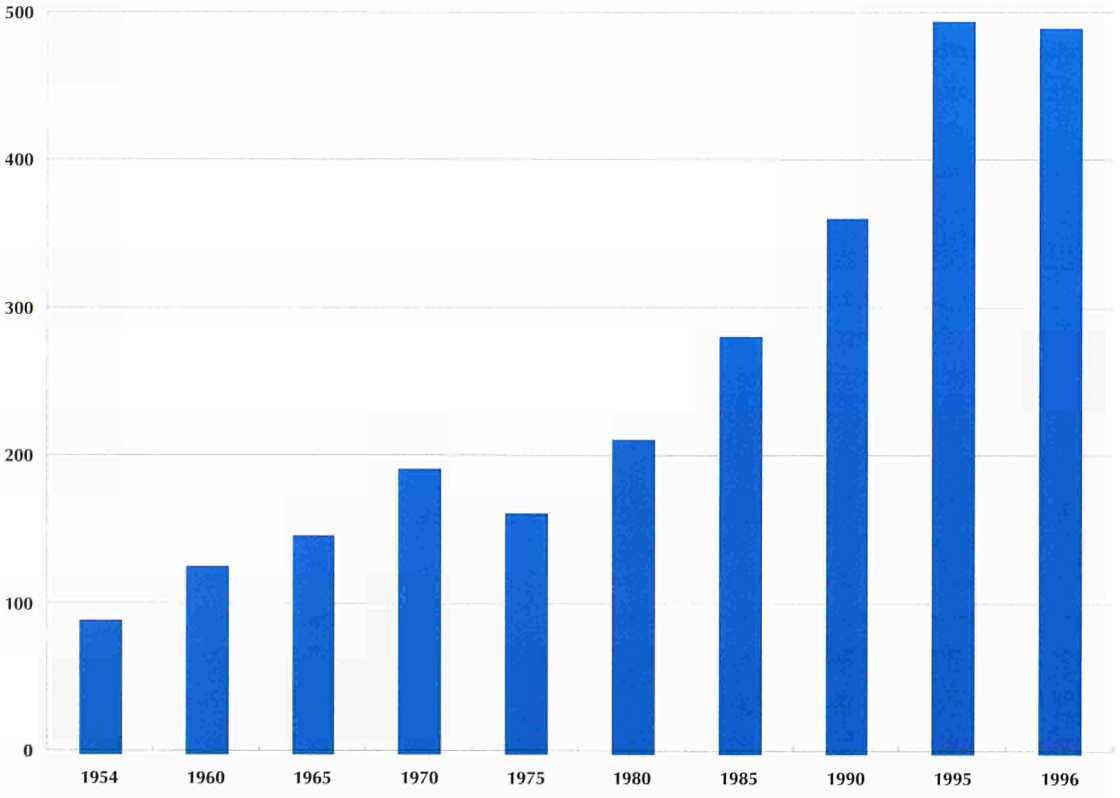


1) Has to be confined to the EU-10 as comparable figures for Spain were not available.
2) Because of a change in the underlying statistics, the figure for 1995 is not directly comparable to previous years. Real efficiency may be 0.5% to 1.0% higher.

Source: eurostat

Figure 1.9

Steel productivity (tonnes per man)



Source: eurostat

Continuous casting has had a major influence, not only on energy consumption, as we have already seen, but also on the general efficiency of the steel making process. Its impact can best be gauged by comparing output of crude steel with that of the finished product.

Technological progress should not, however, be thought of as a synonym for energy efficiency. A large number of improvements in the quality of steel have been achieved by passing the steel through further processes after it has been melted. This secondary refinement, which takes place outside the oxygen steel vat, requires a higher steel temperature when the steel leaves the vat than for steel which is not subject to any further treatment. As a consequence, the oxygen steel mill requires less scrap as a coolant, and there is less energy to be recovered.

Of the 39 oxygen steel plants in use in 1993, 32 were equipped with a vacuum degassing in a ladle which is attached to the steel production installation. 54 of the 207 electric steel mills were equipped with this facility. Moreover, 28 electric steel mills had the possibility of degassing under atmospheric pressure. Other options for secondary refinement include the addition of alloys and further oxygen injection.

In the past, the production of alloyed steel was synonymous with improved quality. Technological improvements in rolling techniques, however, have been so great that it is now possible to produce steel of a quality comparable with that of alloyed steel by means of continuous annealing, quenching and tempering and computer-controlled rolling.

Another quality improvement is the coating of plate steel, mainly as a means of preventing rust. Electrical coating, or galvanising, is now standard practice in the steel industry, although it requires additional energy.

Improvements in the quality of steel can also lead to further savings in the production process. An obvious consequence of computer-controlled rolling has been the possibility of offering the customer finer tolerances, which means that the product has a lower weight on delivery. The impact of such quality improvements on steel applications and consumption will be looked at in section 2.

Employment

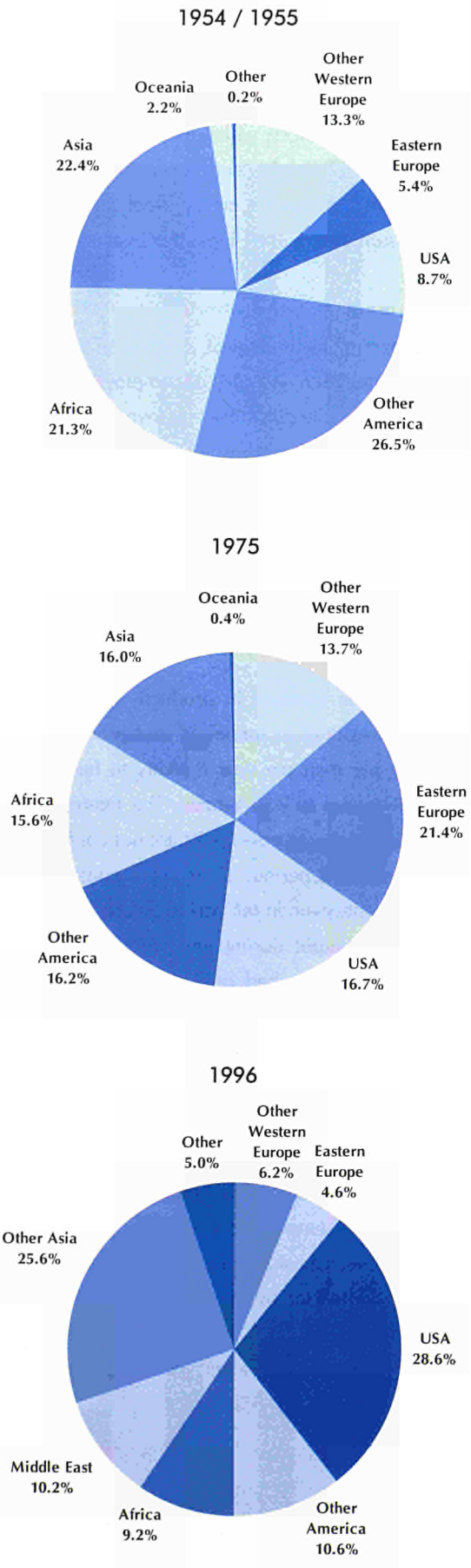
The impact of technological progress in the steel industry has been greatest on employment. The number of people currently employed in the iron and steel sector in EU-15 is actually lower than the number employed in the six original Member States in the early years of the ECSC, despite the EU's successive enlargements. Production of crude steel per employee in this period increased from 100 tonnes per man per year to nearly 500 tonnes.

In reality, the increase in productivity was even greater. Measured in tonnes of end product, productivity per man per year is likely to have risen from 50 tonnes to 450 tonnes. The figures show that productivity improvements are not confined to the most recent period. There were considerable improvements even in the period before 1975. The increase in output during the period meant that higher productivity had only a limited effect on employment. Up until 1964, employment was actually increasing, rising to a peak of 590 thousand persons.

However, since the oil crisis in 1974, steel output has been unable to grow by comparable rates, with the result that employment has gone into a very steep decline. The share of total industrial employment accounted for by the steel industry fell from 2.0% in 1975 to 1.1% in 1987. Since then, the decline has continued, albeit less steeply, and the share now stands at 0.8%.

Figure 1.10

Destination of EU exports (excluding EFTA countries)



Source: eurostat

The steel market

The world market for steel products has undergone some radical changes. The rise of Japan and, more recently, other countries, as powerful industrial nations has been a major factor in these changes. Another factor has been the constant striving for specialisation. This trend is illustrated by the strong increase in intra-EU exports and imports measured as a share of steel production and consumption respectively. Although some of the increase in intra-community trade can be attributed to successive EU enlargements, this will not necessarily boost intra-community trade, nor will it necessarily mean lower exports to non-Member States. Although these are possibilities, the exact opposite could also happen, depending on the supply structure in the new Member States.

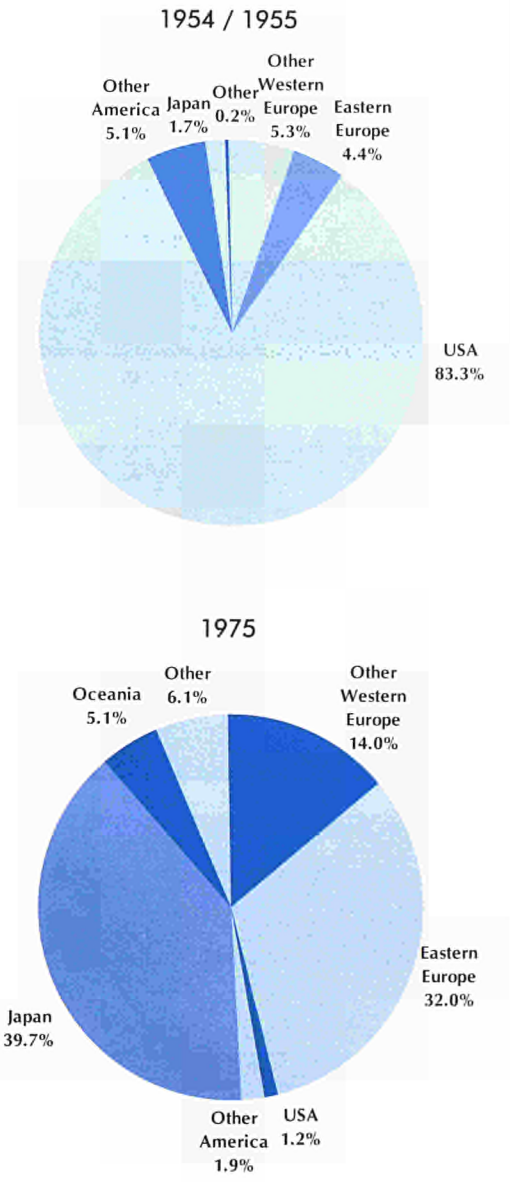
At the same time that intra-community trade has grown, the domestic markets for the steel industry have become less important (declining from 75% in 1952 to less than 50% in 1995).

The enlargements of the EU have obviously had a major impact on the regional distribution of exports and imports. The share of other western European countries in EU exports fell from 65% in 1954 to 19% in 1995, as a number of countries joined the EU. Even if trade with the EFTA countries is disregarded (given that most of its former members are now part of the EU), the changes in the pattern of imports and exports are considerable.

The USA, which was one of the main exporters to the EU in the 1950s, became a net importer by the end of the 1960s. Japan's exports to the EU increased at a fast pace in the 1970s, but are now back to the same level as in the 1950s. The EU's exports to Eastern Europe have become less important as a result of that region's declining consumption since the collapse of communism, although Eastern Europe has become the main exporter to the EU. China was an important market for EU producers for a short period from 1992 to 1994 (taking more than 14% of EU exports in 1993). By 1996, however, China accounted for just 2% of the EU's exports.

Figure 1.11

Origin of EU imports (excluding EFTA countries)



Source: eurostat

Table 1.7

Steel market developments (thousand tonnes)

	Production	Exports		Export shares (%)	
		Extra-EU	Intra-EU	Extra-EU	Intra-EU
1952	41,996	7,913	2,431	18.8	5.8
1955	52,777	9,398	6,090	17.8	11.5
1960	73,076	13,996	11,525	19.2	15.8
1965	85,991	18,577	15,282	21.6	17.8
1970	109,203	17,712	23,112	16.2	21.2
1975	125,560	26,824	25,168	21.4	20.0
1980	127,738	28,325	32,623	22.2	25.5
1985	120,641	28,776	28,505	23.9	23.6
1990	136,853	21,500	42,408	15.7	31.0
1995	155,744	23,512	58,902	15.1	37.8

	Consumption	Imports		Import shares (%)	
		Extra-EU	Intra-EU	Extra-EU	Intra-EU
1952	33,462	670	2,431	2.0	7.3
1955	44,350	1,200	6,090	2.7	13.7
1960	59,842	2,394	11,525	4.0	19.3
1965	70,014	2,465	15,282	3.5	21.8
1970	97,094	8,520	23,112	8.8	23.8
1975	111,447	7,757	25,168	7.0	22.6
1980	120,714	11,598	32,623	9.6	27.0
1985	101,874	9,958	28,505	9.8	28.0
1990	125,729	12,860	42,408	10.2	33.7
1995	143,402	16,834	58,902	11.7	41.1

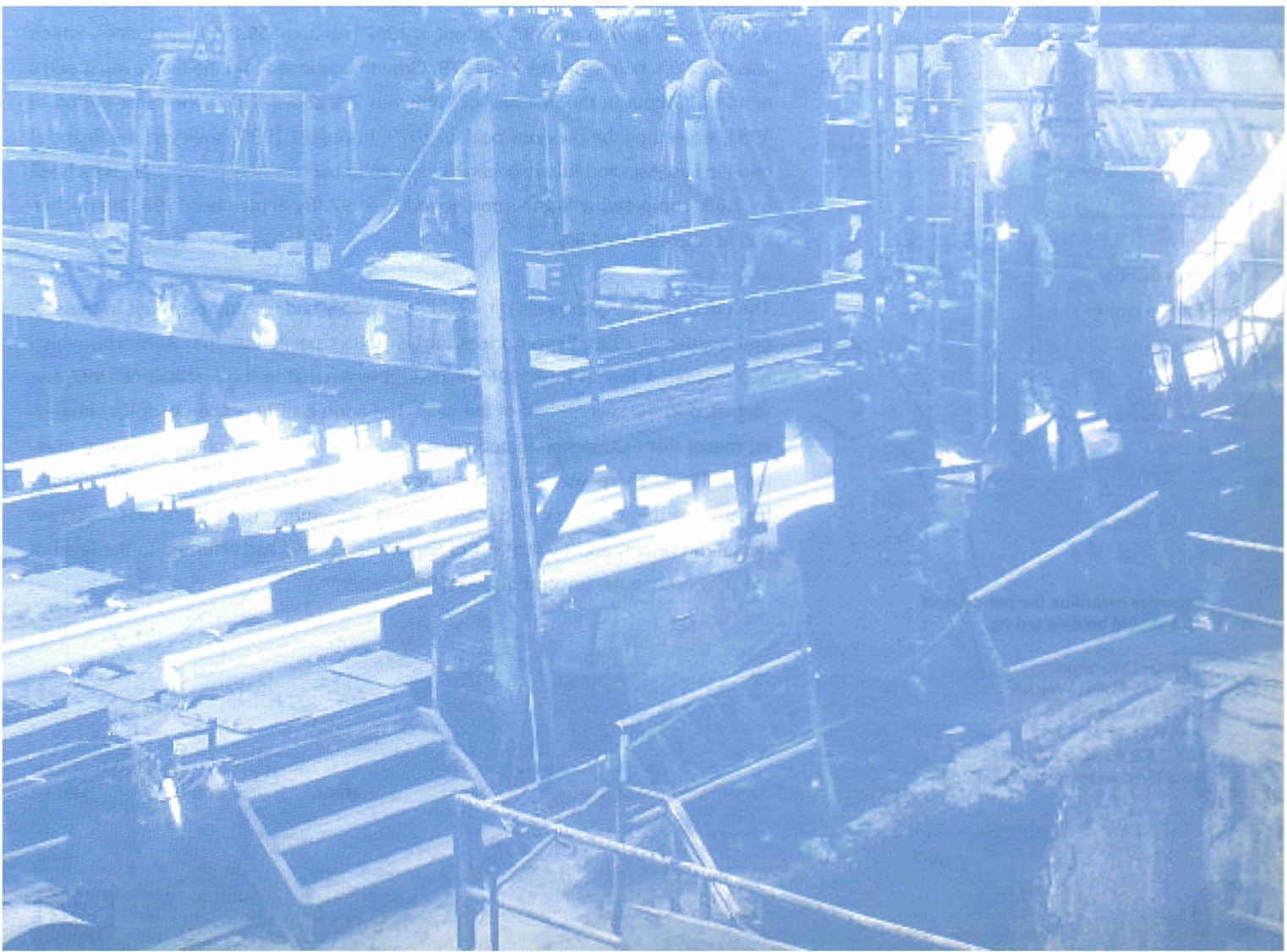
Source: eurostat

Conclusions

Steel has retained its position as a leading material. Its energy and manpower requirements have been reduced, enabling it to maintain its competitive position with respect to other materials.

Structural changes have occurred in the provision of raw materials and energy. The world-wide revolution in transport costs has made the EU steel industry highly dependent on imported raw materials and energy. There has therefore been a fundamental change in the criteria determining the location of steelworks. The proximity of coal and ore mines is no longer crucial. Proximity to the consumer is still important, but compared with the 1950s, coastal works have gained a strong position in the EU.

2. Current trends



2. Current trends

Introduction

The steep fall in steel production at the end of 1995 did not mark the beginning of an extended recession, as is often the case in the steel cycle. Production recovered in the first quarter of 1996, very gradually at first, but at an accelerating rate by the end of the year and throughout 1997. A 5.9% decline in output in 1996 was followed by 9% growth in 1997. Output in 1997 reached 159.8 million tonnes, which was still 3.9% below the peak of 1979. Growth continued into the first seven months of 1998. Output in the first half of 1998 was 7% above that in the same period of 1997, exceeding the previous peak in 1979. In August 1998, however, the financial crisis in East Asia and Russia began to have an impact on steel production, which fell by 2.6% compared with the same period in 1997. By September 1998, the decline had accelerated to 4.8%.

The effect of the Asian crisis on world steel prices had already been felt in the second quarter of 1998. Export prices (in US dollars per tonne, fob, Antwerp), which had reached a low in July 1996, recovered somewhat in the first half of 1997, but stagnated in the second half of the year. The appreciation of the US dollar, however, meant that ECU-denominated prices continued to rise up until the second quarter of 1998. There was some hesitancy in the second quarter of 1998, mainly because of the Asian crisis. By August and September 1998 there was a serious decline in prices, and by the end of September, prices had returned to the level of the previous trough (second quarter 1994).

Table 2.1

Steel consumption in the EU by consumption branch, 1995[1]

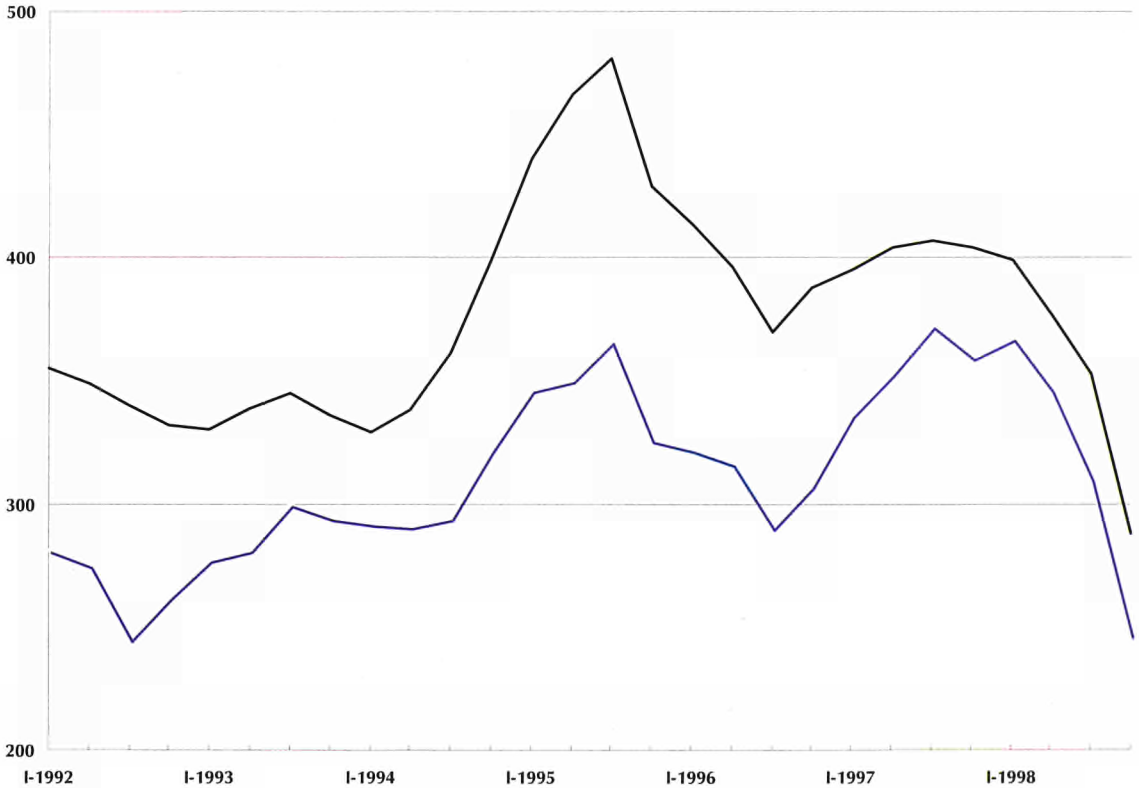
	1,000 metric tonnes	%
Mechanical engineering	16,421	14.2
Electrical engineering	5,675	4.9
Shipbuilding	1,770	1.5
Vehicles and other transport	18,958	16.4
Structural steelwork	11,420	9.9
Building and civil engineering	21,899	18.9
Metal goods	19,834	17.1
Cans and metal boxes	4,080	3.5
Boilers, drums and vessels	5,196	4.5
Other consuming industries	10,656	9.2

1) Because of differences in definition, figures for Sweden are partially estimated.

Source: eurostat

Figure 2.1

FOB Antwerp export quotations (units)



Source: eurostat

Table 2.2

Market size (1992=100)

	1996	1997	1998
1st quarter	106.2	109.3	129.7
2nd quarter	105.4	118.4	127.7
3rd quarter	92.2	104.1	:
4th quarter	99.5	116.8	:

Source: eurostat

The steel market

Economic growth in EU-15 in 1997 was 2.6%, about 1% more than in the previous year. The second quarter, in particular, saw very strong growth: 1.4% compared with the first quarter. In the third and fourth quarters, growth returned to more modest levels of 0.7% and 0.6% respectively. The growth of gross investment in fixed assets during this period lagged somewhat. Investment in machines and equipment made the largest contribution to GDP growth, whilst the building sector actually made a negative contribution to gross investment. Rising private consumption was mainly reflected in higher car production, with the result that steel consumption grew significantly, despite a fairly weak market for non-plate products, which are used mainly in the building industry.

This positive trend continued into the first quarter of 1998. The index of apparent consumption for steel rose in the first and second quarters of 1998 by 15% and 12% respectively for EU-15 compared with the corresponding periods of 1997. The effects of the crisis in East Asia and Russia were likely to make growth rates for the rest of 1998 more modest.

The growth in steel consumption in 1997 was spread over all the EU Member States except Finland and the BLEU. The declines in these countries represent a correction from the very strong growth seen in 1996, when consumption in the EU as a whole fell by 7%. Growth in the other Member States varied from 5.3% in the United Kingdom to 22.5% in Spain. The low rate of growth in the United Kingdom was due to the relative strength of sterling against the euro currencies. United Kingdom steel consumption actually fell in the first quarter of 1998. Growth in Germany accelerated to 14.6% in the fourth quarter of 1997, compared with 9.3% for the year as a whole and 16.2% in the first quarter of 1998.

Table 2.3

Market supply (1992=100)

	1995	1996	1997	1998
1st quarter	119.5	106.2	109.3	125.9
2nd quarter	118.2	102.1	118.4	131.0
3rd quarter	101.1	92.2	104.1	:
4th quarter	100.1	99.5	116.8	:

Source: eurostat

Table 2.4

Apparent crude steel consumption (thousand tonnes)

	III-1997	IV-1997	I-1998	II-1998	1996	1996 (% share)	1997	1997 (% share)	II-1998 (t/t-4,%)	1997 (t/t-1,%)
EU-15	34,532	38,784	42,781	41,738	133,505	100.0	148,928	100.0	6.2	11.6
B/L	873	1,255	1,931	1,044	5,001	3.7	4,857	3.3	-17.1	-2.9
DK	386	477	588	486	1,546	1.2	1,758	1.2	1.3	13.7
D	10,188	10,070	10,898	10,666	36,706	27.5	40,103	26.9	1.9	9.3
EL	680	629	678	694	2,402	1.8	2,734	1.8	-10.0	13.8
E	3,481	4,328	4,139	4,796	12,619	9.5	15,456	10.4	7.4	22.5
F	3,712	4,523	5,298	5,143	15,755	11.8	17,228	11.6	10.1	9.3
IRL	153	176	188	174	620	0.5	658	0.4	14.5	6.1
I	7,232	8,416	9,618	9,600	26,935	20.2	32,356	21.7	12.2	20.1
NL	1,267	1,419	1,610	1,718	4,984	3.7	5,513	3.7	12.7	10.6
A	910	949	892	869	3,288	2.5	3,706	2.5	-5.6	12.7
P	656	649	746	741	2,170	1.6	2,624	1.8	2.9	20.9
FIN	423	543	578	622	2,636	2.0	1,807	1.2	38.5	-31.4
S	900	1,167	1,254	1,001	3,577	2.7	4,048	2.7	-4.5	13.2
UK	3,671	4,183	4,363	4,184	15,266	11.4	16,080	10.8	9.9	5.3

Source: eurostat

Table 2.5

Structure of the steel market (thousand tonnes)

	Production		Imports		Import share (% share of cons.)		Exports		Consumption		Export share (% share of prod.)	
	1997	II-1998	1997	II-1998	1997	II-1998	1997	II-1998	1997	II-1998	1997	II-1998
EU-15	159,797	42,833	13,169	5,737	10.0	15.5	22,595	5,012	148,928	41,738	16.0	13.2
B/L	13,318	3,727	7,617	2,536	177.2	274.5	15,591	4,481	4,857	1,044	132.3	135.9
DK	787	176	1,736	474	111.6	110.2	819	182	1,758	486	117.6	116.9
D	45,009	11,711	14,383	4,036	40.5	42.8	19,494	5,003	40,103	10,666	48.9	48.3
EL	1,016	312	2,089	463	86.3	75.4	466	95	2,734	694	51.8	34.4
E	13,670	4,136	6,016	1,835	44.0	43.2	4,494	1,187	15,456	4,796	37.1	32.4
F	19,773	5,303	10,602	3,353	69.5	73.7	12,780	3,265	17,228	5,143	73.0	69.6
IRL	336	97	532	146	91.4	94.8	296	102	658	174	99.5	118.8
I	25,800	7,127	12,402	4,172	43.3	49.1	7,016	1,787	32,356	9,600	30.7	28.3
NL	6,641	1,674	4,903	1,128	100.5	74.2	6,303	891	5,513	1,718	107.2	60.1
A	5,196	1,329	1,533	516	46.7	67.1	2,962	931	3,706	869	64.4	79.2
P	905	228	1,838	488	79.2	74.4	337	110	2,624	741	42.1	54.5
FIN	3,711	990	1,079	341	67.5	62.0	2,235	581	1,807	622	68.1	66.3
S	5,106	1,400	2,344	593	65.4	66.9	3,183	796	4,048	1,001	70.4	64.2
UK	18,530	4,623	5,397	1,561	37.9	42.2	8,014	1,853	16,080	4,184	48.9	45.3

Source: eurostat

External trade

Despite the 5.8% growth in world steel consumption in 1997, EU exports to non-Member States declined by a dramatic 14%, from 26.2 to 22.6 million tonnes. Thanks to improved market conditions, however, the value of total exports fell only marginally, from 11.1 billion ECU to 11.0 billion ECU, a figure which was still higher than the 10.9 billion ECU recorded in 1993, 1994 and 1995. The decline in exports continued in the first half of 1998. In the first quarter, export volumes were 14% down on the corresponding quarter of 1997, although their value was higher.

Imports from non-Member States in 1997 rose by 17.0%, 5.0% more than the increase in consumption. This means that the market penetration of imports rose from 9.3% to 9.7%. In the first quarter of 1998, import growth accelerated considerably, and imports were 60% higher than in the first quarter of 1997. By the second quarter, they were 78% higher. One result of this was that the EU's net trading volume in the first quarter of 1998 was negative for the first time in its history. Nevertheless, it managed to post a positive trade balance in steel products, with exports valued at 2.5 billion ECU, against imports of 1.7 billion ECU. Exports in 1997 were worth 11.0 billion ECU and imports just 4.4 billion ECU.

The deterioration in the trade balance with non-Member States is affecting all the countries of the Union (except Finland), which has seen a strong recovery from the decline observed in 1996. Greece recorded the largest increase in imports in 1997, from 0.6 to 1.1 million tonnes, an increase of 85%. The decline in exports hit the Italian steel industry hardest, with exports in volume terms falling from 3.4 to 2.2 million tonnes (-35%).

Extra-EU imports were highest in Greece, where imports accounted for more than 40% of consumption in 1997, followed by the BLEU (17.0%), Austria (15.0%), Denmark and Italy (both 12.5%). Extra-EU imports in France, the Netherlands and Spain were below the EU average, with market shares of 2.0%, 6.5% and 7.0% respectively.

Italy accounted for 29% of the EU's total steel imports in 1997, more than Germany's 25% share. In 1998, the situation in Italy deteriorated, to the extent that Italy took 33% of the EU's steel imports in the first two quarters of 1998, whereas the share taken by Germany declined to 18%.

The Asian crisis hit exports as early as 1997, and exports to the region fell by 30%. The crisis was not the only cause of the decline, however. In fact, the largest decline was seen in exports to China, which plummeted by 40%. Exports to North and South America were also reduced, by 14% overall (18% in the case of the USA and 25% in the case of Canada). By contrast, exports to Eastern Europe performed well, rising by 29%. Exports to other western European countries grew by 7%. The first quarter of 1998 did not see any fundamental shift in the pattern: with exports to western Europe continuing to expand, and those to Eastern Europe growing even quicker, whilst exports to other regions continued to fall.

The decline in exports can therefore not be directly attributed to dwindling markets. The IISI, for example, calculates that steel consumption in China increased by 3.7%. Exports to Latin American countries, the USA and Canada also declined, despite higher consumption. The decline in EU exports therefore represents a significant loss of market share in these countries.

On the other hand, the fall in consumption in Asia has brought about a fundamental shift in world trade flows. East Asian producers have gained market share in America and Eastern Europe. This is one of the reasons why EU and Eastern European producers have seen their market shares fall in the USA. Harsher competition in Eastern Europe has led local producers to intensify their export drive in the EU.

Table 2.6

External trade in volume (thousand tonnes)

Imports from third countries	1997	1997 (% share)	1997 (t/t-1, %)	II-1998	II-1998 (t/t-1, %)	II-1998 (t/t-4, %)
EU-15	13,169	100.0	16.8	5,802	17.9	78.7
B/L	748	5.7	29.6	677	39.0	366.9
DK	202	1.5	37.4	69	-13.8	35.3
D	3,246	24.6	6.0	1,038	7.5	30.1
EL	1,142	8.7	84.8	185	-29.7	-25.1
E	995	7.6	-4.7	408	8.8	38.8
F	299	2.3	-3.5	295	82.1	293.3
IRL	27	0.2	-34.1	6	-45.5	0.0
I	3,783	28.7	23.1	1,885	15.5	96.1
NL	322	2.4	16.2	203	47.1	160.3
A	492	3.7	53.8	242	63.5	126.2
P	212	1.6	50.4	112	-2.6	138.3
FIN	440	3.3	-19.0	127	-7.3	39.6
S	202	1.5	6.9	79	8.2	54.9
UK	1,058	8.0	12.8	476	41.7	61.4

Exports to third countries	1997	1997 (% share)	1997 (t/t-1, %)	II-1998	II-1998 (t/t-1, %)	II-1998 (t/t-4, %)
EU-15	22,595	100.0	-10.5	4,930	8.4	-19.2
B/L	2,393	10.6	-14.9	573	19.6	-6.1
DK	135	0.6	18.4	31	-13.9	-3.1
D	6,877	30.4	-4.4	1,386	-1.8	-20.5
EL	242	1.1	-25.5	49	14.0	-33.8
E	1,875	8.3	-10.8	418	22.9	-32.1
F	2,635	11.7	-7.8	583	12.8	-24.9
IRL	3	0.0	-84.2	0	0.0	0.0
I	2,205	9.8	-34.3	516	30.6	-11.9
NL	1,264	5.6	-33.7	270	67.7	-3.6
A	389	1.7	40.9	175	-12.5	75.0
P	82	0.4	-47.8	12	50.0	-36.8
FIN	1,393	6.2	182.6	268	-33.2	-26.8
S	677	3.0	-12.3	174	12.3	-4.9
UK	2,432	10.8	-15.0	475	18.2	-33.8

Source: eurostat

As a result, EU imports from Eastern Europe grew at a fast pace, rising by 27% in 1997 and 44% in the first quarter of 1998. Although imports from East Asia as a whole were unchanged in 1997, there was a shift within the total. Imports from China and Japan declined, whilst imports from other East Asian countries rose by 20%. In the first quarter of 1998, imports from the latter exploded by 575%. Imports from other western European countries increased by 52% in 1997 and 38% in the first quarter of 1998. On the other hand, imports from the USA and other countries in the American continent declined by 46% and 32% respectively in 1997.

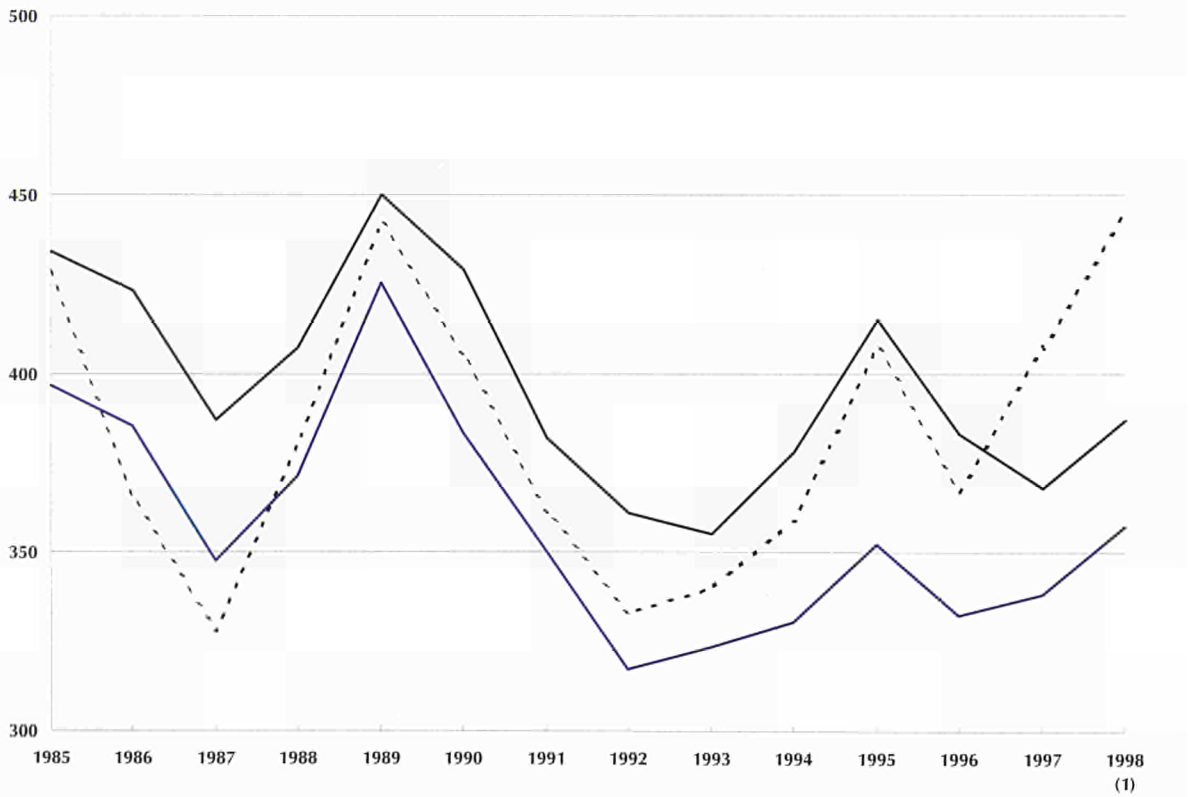
Imports of all steel products increased within the EU. The largest increases were recorded for merchant bars and coated flats, and the smallest for wire rods. The largest import segment of the market is still comprised of hot-rolled steel (25% of the total in 1997 and 29% in the first quarter of 1998), and semi-finished products, which made up 19% of the total in 1997 and 20% in the first quarter of 1998. The share of products with a high value added is still limited, less than 2% in the case of sheet steel 5% for other coated plate. This import structure goes some way to explain the low value of imports per tonne and (given the high value of exports per tonne) the continuing trade surplus in steel products expressed in ECU terms.

The shares of hot-rolled steel and semi-finished products in total exports were equal to just 15% and 10% respectively in 1997. In the first quarter of 1998, the share of semi-finished products declined to just 5%. The shares of non-coated, coated and sheet steel, by contrast, were 15%, 12% and 4% of exports respectively in 1997. In the first quarter of 1998 these shares rose to 16%, 14% and 5%.

The shifts in the export position of the EU Member States have been modest. Germany, the largest exporter, accounted for 30% of EU exports in 1997 and maintained its share in the first half of 1998. The Netherlands was the only country to record a major reduction in its share of the EU market, down from 7.3% in 1996 to 5.6% in 1997 (and only 4.5%

Figure 2.2

Development of unit values (ECU/tonne)



1) First quarter.

Source: eurostat

in the first half of 1998). Austria improved its position, from 1.7% to 4.0%. Finland's share also increased slightly.

Intra-community trade and output

Intra-community trade grew by 15% in 1997, compared to 9% growth in output and an 11.6% increase in consumption. This figure highlights the on-going drive towards specialisation within the EU. The first quarter of 1998 saw growth of 13%.

Not all Member States are equally involved in intra-community trade. BLEU accounted for 12% of internal EU exports, but 22% of intra-EU imports, both figures are higher than the BLEU's 6.7% share in EU production and 3.3% share in consumption. These figures reflect the fact that the BLEU's exports to the rest of the EU currently amount to 110% of domestic production.

At the other end of the scale, Germany's 21% share in intra-community trade represents only 31% of German output. Intra-community trade is of particular importance to Denmark (96% of domestic output), Ireland (also 96%) and the Netherlands (84%). Three of these four countries are also highly dependent on extra-EU exports: the Netherlands (20.9% of its output), the BLEU (19.7%) and Denmark (18.9%). Greece's geographical position dictates to some degree its comparatively high dependence on extra-EU exports (20.9%).

Intra-community trade is much less important for the steel industries of Greece, Spain, Italy and Finland (less than 25% of their production, compared with 42% for the EU as a whole). Exports from Greece and Spain to other EU Member States fell in 1997. In the case of Spain, this was clearly a result of the very fast increase in domestic consumption. Output in Spain rose by 12%, but consumption by 22.5%. Exports from Denmark,

Table 2.8

Steel production (thousand tonnes)

	I-1998	II-1998	III-1998	IV-1998	1997	1997 (% share)	1998	1998 (% share)	IV-1998 (t/t-1,%)	IV-1998 (t/t-4,%)	1998 (t/t-1,%)
EU-15	42,042	42,833	37,953	37,672	159,797	100.0	160,500	100.0	-0.7	-9.2	0.4
B	3,017	3,076	2,892	2,630	10,738	6.7	11,615	7.2	-9.1	0.1	8.2
DK	226	176	182	233	787	0.5	817	0.5	28.0	10.4	3.8
D	11,856	11,711	10,831	10,283	45,009	28.2	44,681	27.8	-5.1	-12.6	-0.7
EL	279	312	245	277	1,016	0.6	1,113	0.7	13.1	-0.7	9.5
E	3,810	4,136	3,519	3,430	13,670	8.6	14,895	9.3	-2.5	-3.9	9.0
F	5,139	5,303	4,736	4,853	19,773	12.4	20,031	12.5	2.5	-3.2	1.3
IRL	97	97	80	96	336	0.2	370	0.2	20.0	3.2	10.1
I	6,831	7,127	5,746	6,161	25,800	16.1	25,865	16.1	7.2	-10.5	0.3
L	653	651	539	635	2,580	1.6	2,478	1.5	17.8	-3.6	-4.0
NL	1,659	1,674	1,668	1,425	6,640	4.2	6,426	4.0	-14.6	-16.5	-3.2
A	1,361	1,329	1,263	1,390	5,196	3.3	5,343	3.3	10.1	6.3	2.8
P	255	228	210	234	905	0.6	927	0.6	11.4	-7.9	2.4
FIN	990	990	964	990	3,711	2.3	3,934	2.5	2.7	0.4	6.0
S	1,464	1,400	935	1,253	5,106	3.2	5,052	3.1	34.0	-18.5	-1.1
UK	4,405	4,623	4,143	3,782	18,530	11.6	16,953	10.6	-8.7	-17.9	-8.5

Source: eurostat

Germany, the Netherlands and Austria to the rest of the EU rose by more than the EU average. The first three of these countries recorded higher market shares, which rose from 18.5% of intra-community trade to 20.6% in the case of Germany and from 7.5% to 8.2% in the case of the Netherlands (although subsequently falling in the first quarter of 1998 to 5.8%). The British steel industry lost market share in the EU in both 1997 and 1998 (from 9.8% to 9.1% between 1997 and 1998, and further declining to 8.9% in the first quarter of 1998). These declines may, at least in part, be attributed to the strength of sterling.

As a result of the 12% growth in steel consumption in the EU and the lower export surplus, steel production in the EU rose by 9% to 159.8 million tonnes in 1997, although this figure was still 2.6% below its peak of 1995. In the first seven months of 1998, output continued to rise (by 11.5% in the first quarter and 3.5% in the second quarter, compared with the corresponding periods in 1997). The third quarter, however, saw a decline of 2.4%. The increase was spread amongst almost all the Member States, with reductions seen in only Belgium and Ireland. Belgian output, in particular, suffered as a result of labour unrest, such that production growth in the first half of 1998 was considerably higher in Belgium than in the EU as a whole.

Table 2.9

Producer prices
in ECU,
NACE Rev. 1 27.10
(index 1995=100)

I-1996	99.6
II-1996	97.1
III-1996	95.4
IV-1996	94.5
I-1997	93.6
II-1997	94.7
III-1997	97.0
IV-1997	98.2
I-1998	99.8

Source: eurostat

Belgium's share of EU steel production, which had fallen from 7.3% in 1996 to 6.7% in 1997, recovered to 7.1% in the second quarter of 1998.

Despite uneven growth rates, the structure of steel production in the EU remains little changed. The United Kingdom's share, which had risen from 11.3% in 1995 to 12.3% in 1996, declined in 1997 and the first nine months of 1998 to 11.1%. The share in production accounted for by Italy has fallen in four successive years, from 17.8% in 1995 to 15.1% in 1998. Germany's share rose from 27% in 1996 to 28% in 1997.

Producer prices and turnover

The low per-tonne import value, combined with high export values, explained the EU's continuing positive trade balance in the first quarter of 1998, expressed in value terms.

Trends in the per-tonne value of steel in world markets do not always accurately reflect price trends, however. Although the average value per tonne of imports from non-Member States declined by 1.2% in 1997, the average value weighted with a standard production range, rose by 1.7%. The fall in the total value per tonne was due to a shift towards semi-finished goods.

The increase in the weighted per-tonne value of extra-EU exports took place in parallel with a modest increase in the weighted import value, but also a decrease in the weighted value of intra-community trade. As a result, the weighted value of exports to non-Member States increased to a level above the per-tonne value of intra-community trade. This has happened on previous occasions, in one or more quarters of 1985, 1989 and 1995. Throughout 1997, on the other hand, the export value per tonne was higher than the corresponding value of intra-community trade, and this continued to be the case in the first half of 1998. This suggests that the EU's steel industry was in a position to be very selective in its export policy and concentrate on the more lucrative market segments.

At the same time, the per-tonne value of intra-community trade was lower than in 1996 throughout the course of 1997, despite an 11% increase in deliveries in the EU (although an increase was observed during the course of the year).

The same pattern emerges for producer prices. The level seen in the first quarter of 1996 was not regained until 1998. Because of the convergence of the national currencies participating in the euro, trends in producer prices expressed in national currencies did not differ significantly from the trend in ECU terms. In the United Kingdom, in contrast, the difference was quite sizeable. The British steel industry saw a 4.6% sterling-denominated decline in prices (despite an 11.8% increase when expressed in ECU terms), compared with a decline of just 0.7% in the EU as a whole in 1997.

The trend in prices in the euro-zone countries (expressed in ECUs) showed no major differences, with declines of between 3.5% and 4% in most cases. The situation was worse only in Spain (-5.8%), whilst the Italian steel market held up better, with prices falling by just 0.5%.

The differences between the indices (1995 = 100) in the various Member States partly reflect differences in product and quality-mixes between countries and, above all, exchange-rate fluctuations in the period 1995-1997.

The 9% increase in steel production and declines in producer prices of less than 1% led to a 6.3% increase in turnover in 1997. Lower production in Belgium brought in its wake a 5.6% decline in turnover. Turnover was also lower in Spain, where lower prices played an important part.

In line with the positive trend in turnover in 1997, most steel producers reported excellent financial results for the year. The financial results for the EU steel industry as a whole, expressed as the difference between value added and labour costs, rose by 24%, from 9,383 billion ECU to 11,601 billion ECU.

In the first half of 1998, a number of steel producers recorded further improvements in their financial results, varying from a doubling to a fourteen-fold increase, although some companies issued profit warnings for the second half of the year.

Investment

Although there was a gradual improvement in the steel industry's financial results in the course of 1997, weakness in the market at the end of 1996 and beginning of 1997 had a negative impact on investment plans for 1997. For the EU steel industry as a whole, investment declined by 3% compared with 1996. There were widely differing trends in the individual Member States, e.g. declines of more than 20% in Italy and Austria, and increases of more than 15% in Spain and the United Kingdom.

Higher output has meant that investment per tonne decreased, from 26.2 ECU to 23.3 ECU/tonne, which is almost as low as the 21.3 ECU/tonne recorded for 1995. As a percentage of turnover, investment declined to just under 6%.

Productivity and employment

The decline in the number of jobs in the steel industry continued in 1997. The number of jobs shed was equal to 12,500 (4.1% of the total). This was somewhat fewer than the 16,500 job losses recorded in 1996. The decline in production in 1996 meant that productivity, measured as the number of tonnes of steel per working year also fell, from 485 to 479 tonnes/man. Thanks to higher output in 1997, productivity rose strongly, to 545 tonnes/man.

Denmark was the only Member State to record an increase in employment (up by 1.8%). The largest declines were recorded in Belgium, Luxembourg and Portugal. This was explained in Belgium by the fact that two of the smaller Belgian steel producers faced financial problems.

The increase in productivity was greatest in Austria (up by 20.5%) and Greece (up 32.3%). The productivity figures display a high degree of convergence, although considerable differences do still remain. The only country to see productivity fall was Ireland, the country with the highest productivity in the EU.

Productivity measured in terms of tonnes of steel produced per working year is of only limited value as a gauge of actual differences in productivity between countries. Much of the difference can be explained by differences in the product mix, production processes, the degree of processing and the quality mix. A commercial policy aimed at increasing value added per tonne of steel produced usually results in a decline in productivity measured in terms of annual tonnage.

Capacity

Investment activity, which in 1996 was gradually recovering from the major declines seen in 1993 and 1994, contracted slightly in 1997 in response to difficult market conditions at the beginning of the year. As a result, changes in capacity were only very slight, even though most investments aimed at improving productivity also add some capacity.

As a consequence of higher production, capacity utilisation in the EU increased from 73.4% to 80.5% in 1997. In the case of integrated steel mills, capacity utilisation of oxygen steel mills was no less than 86%, a level which had not been reached for 25 years. The continuing growth of production meant that a level of 89% was likely in the first half of 1998.

Table 2.10

Crude steel capacity, production (thousand tonnes) and capacity utilisation (%)

	Crude steel capacity					Steel production		Capacity utilisation						
	1996	1997	1998	1998 (% share)	IV-1998	1998	IV-1998	1996	1997	1998	1998 (t/t-1, %)	III-1998	IV-1998	IV-1998 (t/t-4, %)
EU-15	199,863	198,047	199,077	100.0	49,837	160,500	37,672	73.4	80.7	80.6	-0.1	76.2	75.6	-9.7
B	14,200	12,200	12,400	6.2	3,140	11,615	2,630	75.9	88.0	93.7	6.5	92.6	83.8	-4.9
DK	850	850	850	0.4	213	817	233	86.7	92.6	96.1	3.8	85.4	109.4	10.4
D	51,937	52,100	52,100	26.2	13,024	44,681	10,283	76.6	86.4	85.8	-0.7	83.2	79.0	-12.5
EL	3,812	3,812	3,812	1.9	953	1,113	277	22.2	26.7	29.2	9.4	25.7	29.1	-0.7
E	17,570	18,700	18,800	9.4	4,677	14,895	3,430	69.2	73.1	79.2	8.3	75.1	73.3	-2.1
F	24,634	24,700	24,700	12.4	6,180	20,031	4,853	71.6	80.1	81.1	1.2	76.7	78.5	-3.6
IRL	500	500	500	0.3	125	370	96	68.0	67.2	74.0	10.1	64.0	76.8	3.2
I	37,137	35,600	35,700	17.9	8,935	25,865	6,161	64.4	72.5	72.5	0.0	64.3	69.0	-10.9
L	4,500	4,500	4,500	2.3	1,126	2,478	635	55.6	57.3	55.1	-3.8	47.9	56.4	-3.9
NL	6,790	6,790	6,790	3.4	1,697	6,426	1,425	93.2	97.8	94.6	-3.3	98.3	84.0	-16.4
A	5,555	5,555	5,555	2.8	1,389	5,343	1,390	80.2	93.5	96.2	2.9	90.9	100.1	6.3
P	970	970	1,400	0.7	376	927	234	89.8	93.3	66.2	-29.0	57.4	62.2	-33.4
FIN	4,270	4,270	4,270	2.1	1,068	3,934	990	76.8	86.9	92.1	6.0	90.3	92.7	0.2
S	5,920	6,200	6,400	3.2	1,610	5,052	1,253	82.6	82.4	78.9	-4.2	58.2	77.8	-20.6
UK	21,218	21,300	21,300	10.7	5,324	16,953	3,782	85.2	87.0	79.6	-8.5	77.8	71.0	-17.8

Source: eurostat

eurostat

In the case of electric furnaces, capacity utilisation is much lower, but rose from 63% in 1996 to 72% in 1997. Lower capacity utilisation and greater flexibility are typical features of this production process. Many electric steel mills are closed down during holiday periods, which is why capacity utilisation in Greece, Spain, Italy and Luxembourg, four countries where a large share of production is met from electric steel mills, is well below the EU average. Despite this very satisfactory capacity utilisation rate, the steel industry has pushed ahead with restructuring.

Furthermore, there has been a major structural change in the steel market with the merger of the steel activities of Thyssen Aktiengesellschaft and Krupp, which has created Europe's biggest steel producer, somewhat bigger than British Steel and Usinor-Sacilor. In 1996, these three companies each produced in the region of 15-16 million tonnes, compared with the 26 million tonnes produced by Nippon Steel and the 24 million tonnes produced by Posco.

Raw materials

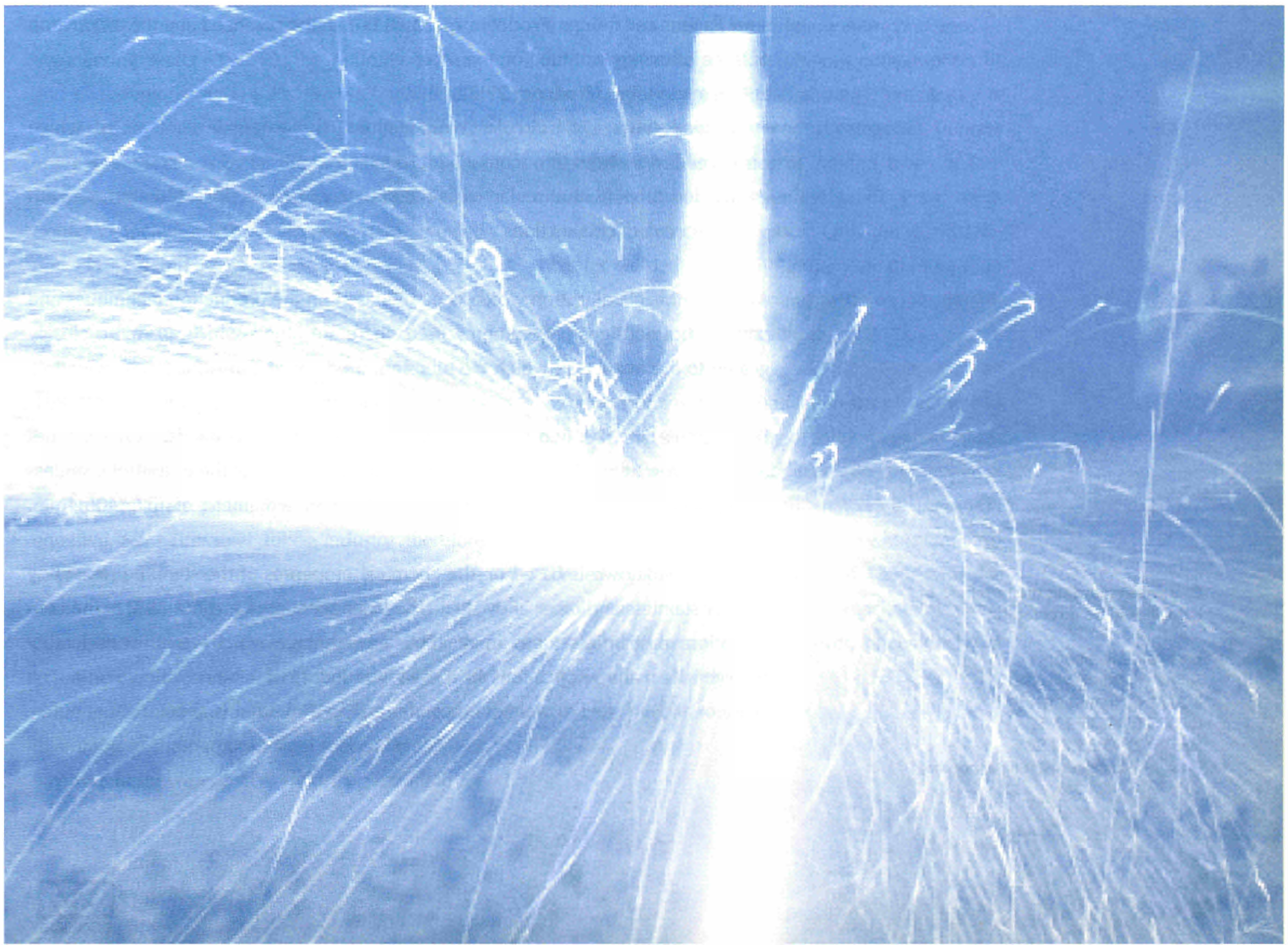
In the wake of increased steel production in 1997, the consumption of steel scrap, the most important raw material for electric furnaces, increased by 10%, from 70.7 million tonnes in 1996 to 77.9 million tonnes in 1997. Since the availability of scrap depends only in part on current output and consumption of steel, and partly on past consumption, the market for scrap has become tight. Imports of scrap from non-Member States, most of which come from Eastern Europe, increased by 44%, from 4.7 million tonnes in 1996 to 6.8 million tonnes. Exports rose only slightly, from 6.8 to 6.9 million tonnes. In the fourth quarter of 1997, the EU actually became a net importer of steel scrap, a trend which continued into the first quarter of 1998 (exports of 1.3 million tonnes and imports of 2.0 million tonnes).

The price per tonne of steel scrap traded on world markets, which fell dramatically from 1,991 ECU/tonne in 1995 to 167 ECU/tonne in 1996 (imports) and from 111 ECU/tonne to 108 ECU/tonne (exports), remained practically unchanged at 164 ECU/tonne for imports and 110 ECU/tonne for exports.

The improvement in the steel market had a greater impact on the price of iron ore. Following a decline in 1996, from 132.2 to 109.9 million tonnes, imports of iron ore rose in 1997 to 118.7 million tonnes, although this figure was still 10% below the level of 1995. By contrast, the price of iron ore, which was unchanged in 1996 at 21 ECU/tonne, rose to 25 ECU/tonne in 1997 and 28 ECU/tonne by the first quarter of 1998.

The coke rate for a tonne of pig iron continued to fall in 1997, as described in the first section of this issue, with major favourable consequences for the environment. There will be a further improvement now that Thyssen Krupp Stahl AG has obtained permission for a 1.5 billion DM investment to replace three coke oven plants which are more than 40 years old.

3. The steel tubes industry



3. The steel tubes industry

Description of the industry

The steel tubes industry as defined by NACE Rev. 1 27.22 includes the manufacture of steel tubes and non-cast steel flanges and fittings for tubes.

Within the industry a clear distinction has to be made between the production of steel flanges and fittings (Prodcom 27.22.20.00) on the one hand and the production of three other types of tube on the other:

- ★ seamless tubes (Prodcom 27.22.10.30);
- ★ welded tubes with circular cross-sections, the external diameter of which exceeds 406.4mm (Prodcom 27.22.10.53);
- ★ welded tubes with circular cross-sections of not more than 406.4mm or with non-circular cross-sections.

Although this classification which is partly based on the production techniques and partly on dimensions is commonly used, there are others which are more closely geared to the markets in which the tubes are used.

For example, the first two categories can be subdivided into standard quality tubes and precision tubes. The latter account for about 10-13% of the output of seamless tubes, but 45-53% of the output of welded tubes with a diameter of up to 406.4mm.

Another breakdown is based on the chemical properties of the steel, i.e. non-alloy steel or stainless and other alloy steel. The latter accounts for about 28% of the consumption of seamless tubes in the EU, a percentage which varies considerably between its many applications in the various industrial sectors which use it. The share of alloyed steel in welded tubes of less than 406.4mm is about 20%.

Although production of flanges and other accessories for steel tubes is an integral part of the industry, output is normally measured in terms of the number of tubes produced. External trade statistics show that the share of flanges and other accessories in EU exports is around 6% or 7% (both intra-community exports and exports to non-Member States) when measured by weight, and about 23% to 24% in terms of value. Their share in imports is even greater, both in weight and value terms. The high per-tonne value of exports of this product category (nearly five times that of exported tubes) clearly reflects the production technology, which is both more labour and capital-intensive.

The most important sector for tubes, as can be seen from the statistics on the consumption of steel by branch of industry, is the category "other industries". It should be borne in mind that consumption of tubes in the oil and gas sectors is attributed to the mining industry, which comes under "other industries". Other major consumers are the mechanical engineering sector (19.7%), the building industry and civil engineering (14.7%), as well as the steel construction industry (15.1%). The mechanical engineering sector is by far the largest consumer of seamless tubes (34.1%), whilst the two above-mentioned branches are more important for welded tubes (15.7% and 17.5% respectively).

Recent developments

Following a 3.3% decline in the output of tubes in 1996, 1997 witnessed a recovery, output increasing by 9.8%. This growth continued in the first quarter of 1998, but declined to 4% by the second and third quarters. In the first nine months, growth equalled 6%. The steel tubes industry therefore somewhat out-performed the steel industry as a whole in 1997, whose growth that year was 9%, before slowing to 4% as an average figure for the first nine months of 1998 and recording a negative value in the third quarter of 1998. Despite the positive trend in the output of steel tubes, the share of turnover in the whole steel industry accounted for by tubes continued to decline to 11.4% of the consumption of ECSC products. This figure confirms the downward trend which began in 1984, when tubes accounted for 20% of the consumption of ECSC products.

Output of seamless tubes, which for many years had been in decline, grew by 11.6% in 1997, thereby outperforming the tubes industry as a whole. Output of this product category actually declined by 1.2% in the third quarter of 1998, although growth in the first months of the year was a fairly healthy at 7.6%.

Welded tubes did somewhat less well, with output growing by 9.2% in 1997 and 5.3% in the first nine months of 1998. Output rose by 6.7% in the third quarter of 1998, compared with just 2.8% in the second quarter.

The increase in the output of tubes in 1997 was largely the result of more favourable conditions in the international market. Overall consumption in the EU grew by just 1.2%, although the picture is different for the various product categories. Imports from non-Member States of welded tubes of less than 406.4mm and seamless tubes grew more quickly than the EU's exports. Only the world market for welded tubes with a diameter of more than 406.4mm improved all round, with imports declining by 42% and exports surging by 75%.

Producer prices, which had fallen steeply at the end of 1996 and the beginning of 1997, began to climb again during the course of 1997. For the year as a whole, however, this meant that prices were 3% below their 1996 level. The recovery in prices continued in the first four months of 1998, with the result that the 1996 level was reached by April 1998. In May and June, however, prices declined again, albeit slightly.

Markets for steel tubes

Although the building industry performed better in 1997 than in 1996, it did not contribute much to the growth in the consumption of tubes. On the other hand, consumption of welded tubes of less than 406.4mm grew by 9.5% in 1997. Consumption of seamless tubes also grew by a fairly strong 5.9%, the most robust growth being recorded in precision tubes for the mechanical engineering sector and in equipment for the chemical industry. As a result, the share of the mechanical engineering sector in the total consumption of small-diameter welded tubes increased again, as it had done in the mid-nineties, when it rose from 30.7% in 1994 to 34.1% in 1995 (EU-12).

There was a serious deterioration affecting large-diameter welded tubes. Consumption of this type of tube, which is mainly used for transporting oil and gas, fell by 53.5%, or 1.2 million tonnes, to stand at 0.6 million tonnes. This market has, however, always been characterised by very large fluctuations, because one or two major projects can account for between 60% and 80% of the market in a given country. As a result, growth in the consumption of large-diameter welded tubes varied considerably between Member States (between -75% and +200%). The largest decline was seen in Italy, although the United Kingdom and the Netherlands, the two countries with the biggest oil and gas industries in the North Sea, also saw consumption fall by 75% and 35% respectively.

The growth in the consumption of small-diameter seamless tubes and welded tubes was more evenly spread among the Member States. Only three countries, Belgium, the Netherlands and Portugal saw declines in the consumption of small-diameter welded tubes. Growth in most countries was sufficient to wipe out the declines seen in 1996. EU consumption in 1997 was 0.8% above the level of 1995. Despite an 11.6% increase, German consumption was still 1% below the level recorded in 1995.

Consumption of seamless tubes in 1997 grew by less than the decline recorded the year before, with the result that consumption in 1997 was still 5% below that of 1995. Again, strong growth of 12.5% in Germany was not enough to offset the -15.7% decline which occurred in 1996. France and Finland were the only two Member States in which consumption in 1997 was greater than in 1995.

The negative growth in welded tubes of more than 406.4mm, meant that growth in the overall market for tubes came out at a modest 1.2% in 1997, considerably less than the 11.5% growth in steel consumption. Although tube production grew more rapidly than tube consumption, it trailed the growth in overall steel consumption, with the result that the share of consumption in ECSC products accounted for by tubes continued to decline.

Consumption data for the first quarter of 1998 revealed strong growth of 16.9% compared with the same period in 1997, a rate which was maintained in April and May. There was particularly strong growth in large-diameter welded tubes (up by 113% in the first quarter compared with the same period in 1997 and up by 55% in April and May). The result of such growth was that the consumption of this product reached the level attained in 1995. There was also faster growth in the consumption of seamless tubes in the first five months of 1998. In the case of small-diameter welded tubes, growth was somewhat less robust than in 1997: 6.6% in the first quarter and 6% in the first five months compared with the same periods in 1997.

Although these consumption data point to healthy market trends, it should be borne in mind that they are based on apparent consumption, calculated from production and the export surplus, and may therefore exaggerate market trends if the strong growth of imports from non-Member States led to a temporary increase in imported stocks.

Intra-community trade

Intra-community trade in tubes rose by 5.9%, from 5.1 to 5.4 million tonnes, somewhat less than the increase in output, but more than the increase in consumption. The share of intra-community trade in consumption therefore rose, to above 50%. The share of intra-community trade in the consumption of seamless tubes was no less than 64%, whilst the corresponding share for welded tubes with a diameter of more than 406.4mm was 57%. The share of intra-community trade in consumption was below 50% only in the case of small-diameter welded tubes (45%).

These figures clearly reflect growing specialisation within the EU, particularly as regards high-value precision tubes. In the case of welded tubes of more than 406.4mm, they do not convey the small number of producers and the major fluctuations which characterise the market. Intra-community trade in this category of tubes was just 41% of consumption in 1996.

The high level of specialisation in the production of seamless tubes is reflected in the value of the traded products. The per-tonne value of seamless tubes in intra-community trade in 1997 was 1,118 ECU/tonne, compared with 661 ECU/tonne for large-diameter welded tubes and 695 ECU/tonne for small-diameter ones.

The depressed market at the end of 1996 also had an impact on the per-tonne value of intra-community trade. The per-tonne value of seamless tubes reached its lowest point in the third quarter of 1997, at a level 8.2% below that in the corresponding quarter of 1996. For 1997 as a whole, the level was 7.1% below that of 1996. Although there was growth in first quarter of 1998, the level remained 5% below what it had been at the beginning of 1997.

The same pattern was seen for welded tubes of less than 406.4mm. Again, the lowest point was reached in the third quarter of 1997. The decline in the price of this product was less steep, however (-4.3% in 1997 compared with 1996). The recovery was also more robust, with the result that the per-tonne value in the first quarter of 1998 was 8.5% higher than at the beginning of 1997.

The small number of suppliers of welded tubes of more than 406.4mm was reflected in more stable price movements. Even for this product, however, prices moved downwards by 3.2% in 1997, the lowest point being reached in the final quarter.

External trade

The EU's trade with non-Member States in 1997 was characterised by a sharp increase in both imports and exports. Imports rose by 6.8% and exports by 36.6%. There were considerable variations in the pattern, as import growth accelerated during the course of the year and imports slowed. There were also big differences between product categories.

The resultant slight improvement in the balance of trade in tubes was due to the recovery in world consumption, which itself was partly the result of improved market conditions in the USA.

World output of tubes grew from 57 to 61 million tonnes in 1997. The growth in welded tubes (up 7.7%) was higher than that of seamless tubes (up 4.9%). This shift is part of a long-term trend. Whilst seamless tubes accounted for only 28% of world output and consumption, they accounted for 41% of world trade. The growth of world trade in seamless tubes was less spectacular however, at 2.5%, compared with growth of 13% for overall trade in tubes in 1997.

For the EU as a whole, exports of welded tubes grew more quickly than exports of seamless tubes. If we exclude large-diameter welded tubes (whose growth rate of 75% may be (to some extent) considered a one-off event, the growth in the EU's exports of seamless tubes was 20% higher than for other welded tubes.

The trade surplus in tubes as a whole rose from 1.65 million tonnes in 1996 to 2.71 million tonnes in 1997. Most of the increase was accounted for by large-diameter welded tubes. The trade surplus in this type of tube doubled from 0.86 to 1.72 million tonnes. The trade surplus in seamless tubes also grew, from 0.93 to 1.17 million tonnes. The deficit in small-diameter welded tubes rose from 0.14 to 0.19 million tonnes. In 1995, however, the deficit was considerably higher, at 0.32 million tonnes. This positive trend in external trade was maintained in the first quarter of 1998, even though the first effects of the Asian crisis were becoming apparent: despite the continuing favourable trend in exports, import growth began to accelerate, thereby posing a threat to EU tube manufacturers within the Internal Market.

In the first quarter of 1998, the trade deficit in small-diameter welded tubes increased further, to 0.12 million (0.5 million tonnes on an annualised basis), as imports grew by 44% compared with the corresponding period of 1997, whilst exports rose by just 20%. Increasing import penetration in the EU market and tougher competition in export markets led to renewed pressure on prices. The per-tonne value of imports fell from 599 ECU to 584 ECU/tonne, a decline of 2.5%, whilst that of exports declined by 1.9%, from 1,057 ECU to 1,037 ECU/tonne. The difference between the per-tonne values of imports and exports clearly reflects the difference in product types: whereas imports consist mainly of standard quality tubes, a large share of exports are high-value precision tubes. Moreover, dumping practices may explain low import prices. The result is that, despite the very big rise in imports in the first quarter of 1998, there was still a trade surplus in small-diameter welded tubes when measured in value terms, although the surplus shrank from 41 million ECU in the first quarter of 1997 to 27 million ECU in the first quarter of 1998, and came to just 4 million ECU in April 1998.

Although the trade surplus shows that the world market for seamless tubes improved in 1997, the per-tonne value of exports fell in that year by 4.4%, from 1,130 ECU to 1,080 ECU/tonne, although this figure was rather distorted by the low prices recorded at the beginning of 1997 (1,020 ECU/tonne). In the first months of 1998, the per-tonne value continued to rise, reaching 1,257 ECU/tonne, a level not seen for five years. This favourable trend also had an impact on the value per tonne of imports, which increased by 5.3% in 1997, from 637 ECU to 671 ECU/tonne and by a further 6.4% compared with the first quarter of 1997. Again (albeit less dramatically than small-diameter welded tubes), the difference between the per-tonne import value and per-tonne export value of this product reflects the large share of precision tubes and special steel tubes in this category.

The major fluctuations which occur in the market for large-diameter welded tubes makes it difficult to distinguish clear trends. The doubling of the trade surplus in 1997 was not reflected in higher prices. The per-tonne value of exports in 1997 was about the same as in 1996. Again, the lowest point was reached in the first quarter of 1997, after which prices rose continuously, a trend which was maintained through the first quarter of 1998 and into April, although price fluctuations in this product category were limited. The difference between the highest and lowest per-tonne values in the last 15 quarters was just 8%.

Higher imports, combined with only slight growth in consumption, led to higher import penetration by all products. The high level of imports of small-diameter welded tubes is reflected in a market share which rose from 11.7% to 12.5%. Imports of large-diameter tubes increased even more, from 15.2% to 19.3%. The market share of imported seamless tubes also rose, from 23.1% to 23.8%, whilst the market share of imported tubes as a whole increased from 14.6% to 15.6%.

The improved conditions in the international market in 1997 were therefore reflected solely in an improvement in the export position. The share of all tubes accounted for by exports rose from 26.2% to 32.8%, the largest increase being recorded for welded tubes of more than 406.4mm (from 49% to 80%).

The impact on individual markets of imports from non-Member States varies. Apart from countries with a very high level of intra-community trade and exports which exceed domestic production, the share of German consumption accounted for by imports was higher than the EU average: 26.3% compared with the average of 23.8% in the case of seamless tubes and 22.2% compared with 12.5% for welded tubes with a diameter of less than 406.4mm. In Italy, too, imports accounted for 34.4% of the consumption of seamless tubes, which was higher than the EU average. In Italy, the import penetration of small welded tubes was 6.7%, well below the EU average.

Output and turnover

The moderate increase in consumption (126 thousand tonnes, or 1.2%) and the increase in the trade surplus (up from 1.65 million to 2.7 million tonnes) meant that the output of tubes in the EU rose by 1.18 million tonnes, or 9.8%. Output growth continued in 1998, albeit at a slower pace: 9.4%, 4.0% and 4.3% in the first three quarters of the year respectively when measured against the corresponding periods in 1997.

The increase in output was fairly evenly spread amongst all types of tube: 11.6% for seamless tubes, 8.9% for welded tubes of less than 406.4mm and 10% for large-diameter tubes. Growth was unevenly spread amongst the Member States, varying between 26.3% in Luxembourg and -1.7% in Belgium. Growth in the Netherlands (3.1%), Austria (2.5%) and the United Kingdom (1.9%) was well below the EU average. Germany (14.5%), Greece (18.2%) and France (12.6%) performed better than average. The share of overall EU tube output accounted for by Germany increased from 27.3% in 1996 to 28.5% in 1997, although some of the improvement was lost in the first half of 1998.

In line with the trend in the per-tonne value of the various products in intra-community and external trade, producer prices in the EU fell by 3% in 1997, the lowest level being reached in the first quarter of that year. Despite the increase in prices, which continued during the course of the year, producer prices in the first quarter of 1998 were 1.4% lower than in 1996. Producer prices fell by about the same amount in all the Member States. Only in Italy was the decline limited to 1%, whilst at the other end of the scale, prices in Sweden fell by 10%. It should be remembered, however, that in 1996 Swedish prices bucked the downward trend which affected all the other Member States (except Greece).

Turnover in the tubes industry rose by less than would be expected given the fall in producer prices and increased output. In part, this was due to the big increase in large-diameter tubes and a further shift in the production package. The larger share of output accounted for by exports also meant that turnover rose by just 1.7%, which was insufficient to offset the -4.8% reduction recorded in 1996. Thanks to only a very slight increase in labour costs (0.4%) in 1997, the industry was able to improve its financial position somewhat.

Employment and productivity

The figures for employment and labour costs relate to NACE Rev. 1 27.2 and include the production of flanges and accessories and the casting of iron tubes.

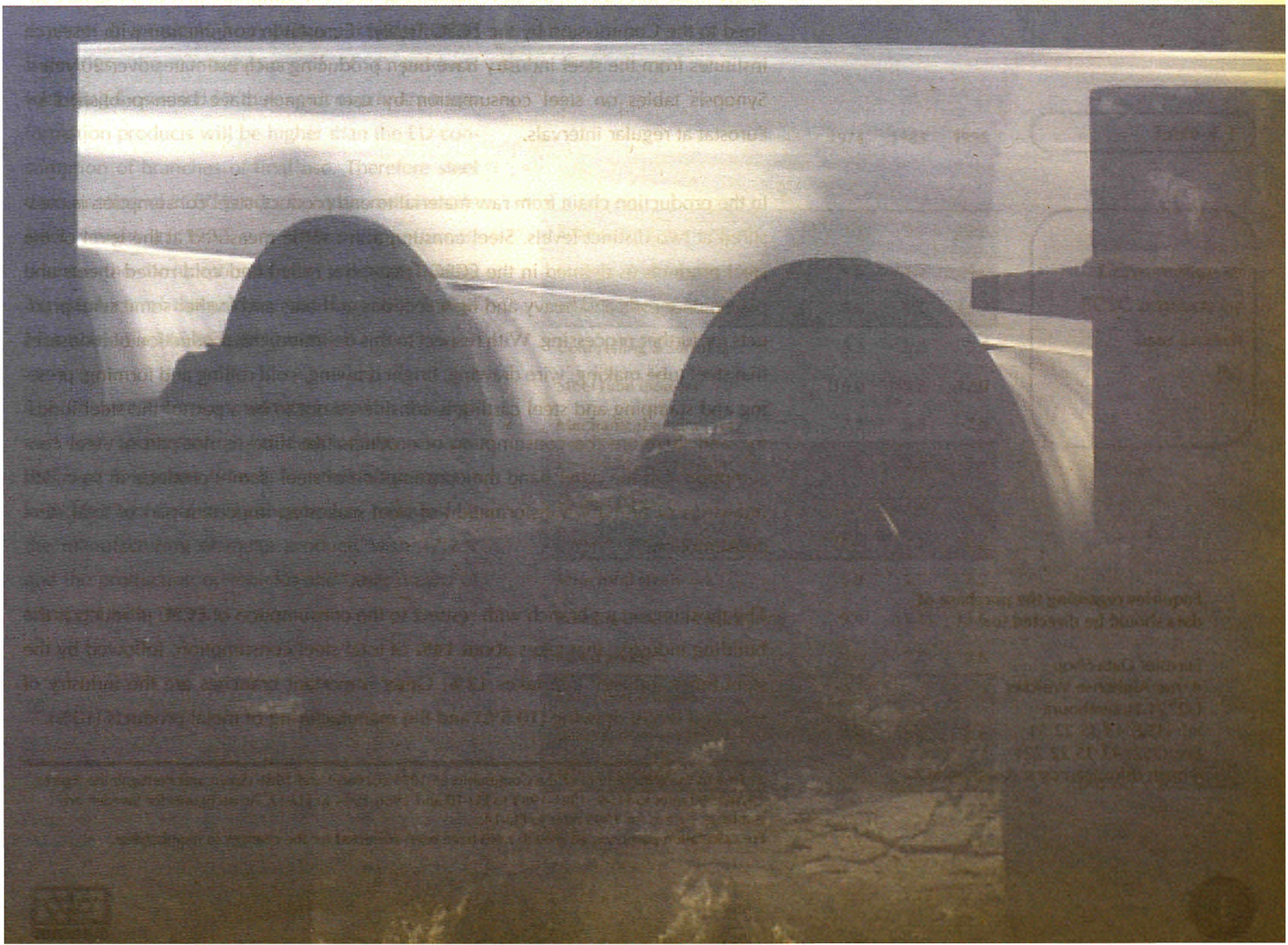
Total employment in the tubes industry in 1997 declined by 1.4%, from 98 thousand to 96.5 thousand. Reliable estimates indicate that the number of persons directly employed in the manufacture of steel tubes (excluding flanges, accessories and iron tubes) declined more rapidly, from 57.1 thousand to 55.5 thousand (or -2.8%).

Employment declined in almost all Member States, although the figures for Italy showed a 4.9% increase, following a year in which 2.3 thousand jobs were shed (15.4% of the total). Employment in Sweden suffered most, falling by 8.4%, followed by Germany (-6.1%). Employment in Spain increased slightly.

Despite the recent decline in employment in Germany, the German tubes industry employed by far the largest number of people in the EU: 42.4 thousand, or 43.9% of the EU total, compared with 46% in 1996.

Productivity in the tubes industry, measured by output per person, increased by 13% in 1997, to 238 tonnes per man year. In 1996, lower output fed through into a decline in productivity. Taken over the last four years, however, productivity has risen by 7.5% per annum.

4. Steel consumption by user branch in the European Union (1974-1995)



4. Steel consumption by user branch in the European Union (1974-1995)

Introduction

This article gives more detail on the development of the steel market in the European Union from 1974 to 1995[1]. Estimates of apparent consumption of various steel products broken down by industry branches have been used by the Commission to regularly make forecasts of the development of steel consumption (part of the tasks confined to the Commission by the ECSC Treaty). Eurostat in conjunction with research institutes from the steel industry have been producing such estimates over 20 years. Synopsis tables on steel consumption by user branch have been published by Eurostat at regular intervals.

In the production chain from raw material to end product, steel consumption is measured at two distinct levels. Steel consumption can be measured at the level of the steel products as defined in the ECSC Treaty, hot rolled and cold rolled sheets and plates, wire rods and heavy and light sections and bars and further some semi products for further processing. With respect to this defintion, the production of industries like steel tube making, wire drawing, bright drawing, cold rolling and forming, pressing and stamping and steel casting is considered not to be a part of the steel industry, and therefore the consumption of products like tubes is not part of steel consumption. On the other hand the consumption of steel (semi-) products in so called industries of primary transformation of steel makes an important part of total steel consumption.

The most important branch with respect to the consumption of ECSC products is the building industry, that takes about 14% of total steel consumption, followed by the steel tubes industry that takes 12%. Other important branches are the industry of wire and bright drawing (10.5%) and the manufacturing of metal products (10%).

1) Due to the enlargement of the Community in 1981 (Greece) and 1986 (Spain and Portugal) the figures 1974-1980 refer to EU-9, 1981-1985 to EU-10 and 1986-1994 to EU-12. As no figures for Sweden are available, figures for 1995 refer to EU-14.
For calculation purposes, all growth rates have been corrected for the changes in membership.

Steel consumption by user branch in the European Union (1974-1995)

The other way to calculate steel consumption includes the consumption of products within the primary transformation industries, but excludes the consumption of ECSC products. As the EU is a net exporter of products from primary transformation industries, the consumption of ECSC products including those used for the export of primary transformation products will be higher than the EU consumption of branches of final use. Therefore steel consumption of ECSC products, measured in crude steel weight in 1997 was 149 million tonnes, whereas the consumption of steel products, including products of the primary transformation industries was only 145 million tonnes.

The final steel consumption measured in this second way reports that the building industry remains the most important branch for steel consumption with 19.1% of final steel consumption, followed by the manufacturing of metal products with 17.2% and the production of vehicles and other means of transport with 16.3%.

A third way to calculate steel consumption also includes the effect of the indirect trade in steel, i.e. the steel contained in final products like cars, ships and packaging that are destined for exports, or imported. Steel consumption in the EU, taking into account the effect of the indirect trade can be calculated at 136 million tonnes, with indirect exports of 28 million tonnes and indirect imports of 15 million tonnes. Steel consumption calculated in such a way can not be broken down by branches, as there will be double counting between branches, e.g. electrical machinery used within a car.

Within the EU there are considerable differences in the sectoral breakdown of steel consumption between the Member States. Differences by country may depend on the structure of the economy, e.g. the share of automotive production in the economy, or the availability of natural gas and oil, that leads to the existence of an important mining industry.

Table 4.1

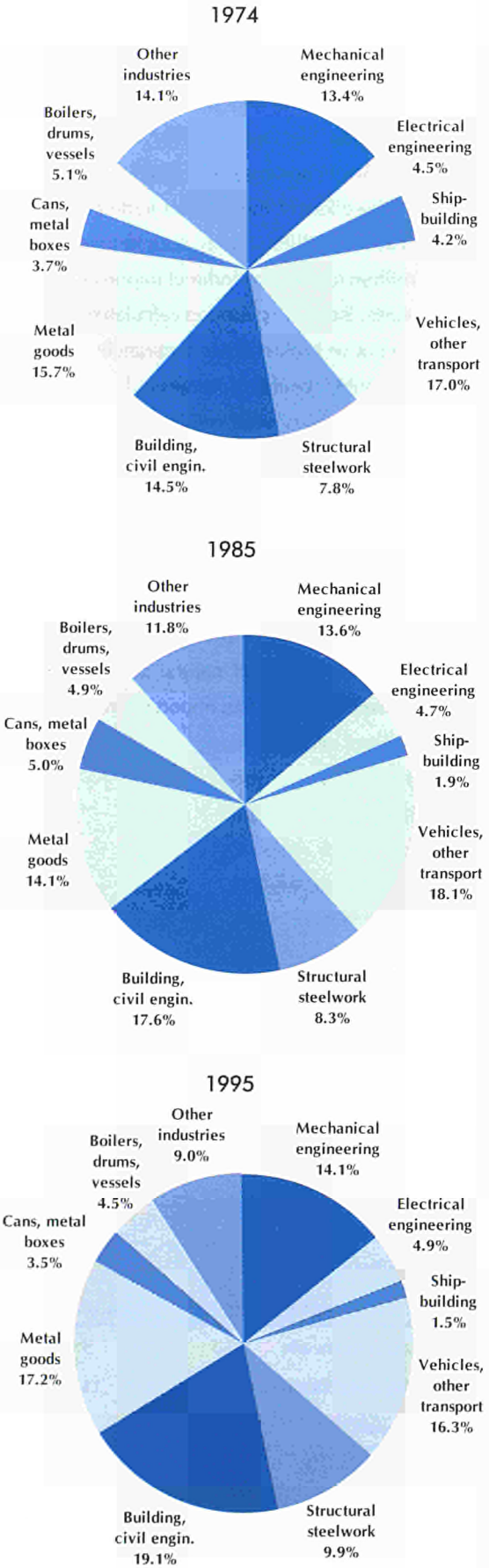
Consumption of ECSC products by user branch (%)

	1974	1985	1995
Steel casting, pressing, etc.	3.3	3.1	2.6
Forging, drop forging	4.8	4.9	4.8
Wire and bright drawing	8.9	9.1	10.3
Cold rolling & forming	5.3	5.5	5.5
Steel tube industry	16.0	19.8	12.0
Mechanical engineering	7.2	6.5	7.6
Electrical engineering	2.8	2.5	3.5
Shipbuilding	3.2	1.2	1.2
Vehicles and other transport	10.6	10.1	10.2
Structural steelwork	5.8	5.5	7.2
Building and civil engineering	9.9	11.2	13.6
Metal goods	9.0	7.7	9.8
Cans, metal boxes	3.0	4.1	3.2
Boilers, drums, vessels	3.5	3.4	3.4
Other industries	6.8	5.4	5.3

Source: eurostat

Figure 4.1

EU exports (excluding EFTA countries)



Source: eurostat

Steel consumption by branch

Although within the EU the concept of the measurement of the consumption of ECSC products in the various branches, including the industries of the primary transformation, is more traditional and is a good instrument to analyse the markets for the steel companies, the concept of final consumption does show more clearly the impact of technological changes within the economy on the steel markets.

Steel consumption by branch clearly depends on the development of the activity of the branch itself. We may compare steel consumption by branch with the production by branch given in physical units. In this way, for each branch the specific steel consumption can be shown, defined as the amount of steel used per unit of production. As in the branches of the primary transformation, the production of the branch is expressed in weight terms, the specific consumption is the reverse of the yield factor and the development is a purely technical process.

In the branches of final use, the production in physical units also may be expressed in weight. Changes in specific consumption in these branches may be related also to production efficiency, but in many cases will be related to substitution tendencies. It is dangerous however to draw conclusions on the material presented here: a registered growth of specific consumption need not be caused by a positive process of substitution or a decline of specific consumption by a negative substitution.

An example resulting from a more in depth analysis will be illustrative of this phenomenon. Within the metal products branch, specific steel consumption for the metal furniture sub-branch has increased. One of the reasons found was a change in the composition of the sub-branch, more office furniture with a higher specific steel consumption and less camping and garden furniture (that used to have a lower specific steel consumption because of the high share of aluminium). A reason for this trend has been a shift to plastic garden furniture, howev-

er, this is not counted in the sub-branch of metal furniture, but as plastic products. Therefore in this case substitution of steel by plastics is not shown in the specific steel consumption of the branch, but is made known by a relative decline in the branch of metal furniture, as compared to plastic products.

In general changes in specific consumption may have been due to a number of different causes:

- changes in production structure of the sector;
- changes in the organisation of the sector. Restructuring of an industry may have the effect that part of the work will be put out to contract. Without having any effect on the amount of steel used, this may have an impact on the measured steel consumption of a branch;
- substitution of steel by other materials;
- changes in the efficiency of material consumption. By better design or improved tolerances or more efficient use, e.g. avoiding the generation of scrap, less material has to be used;
- substitution of steel by other steel products with lower weight.

The steel industry has been able to develop a number of steel qualities by further treatment of molten steel in secondary ladles, e.g. for vacuum degassing, or improving the rolling techniques, as by special heat treatment, quenching and tempering.

Improvements in rolling techniques have resulted in achieving lower rolling tolerances. As such, steel as delivered corresponds much more to that actually used, and it is no longer necessary to include some overweight in deliveries.

Consumption by product

The structure of consumption of various steel products differs greatly from branch to branch. Consumption of steel for packaging consists almost completely of coated sheets, either tinplate or ECCS, electrolytical chrome coated sheets. Only a minor part of consumption consists of drawn wire and cold rolled strip. In reality, consumption of the latter products certainly will have been higher. This is due to the fact that underlying the calculation of steel consumption by branch, steel strip for packaging will have been counted in the various branches where it will have been used for packaging purposes, like in the steel industry itself, but will not have been counted in the packaging industry.

There will be more uncertainties in the material as it is not always possible to trace the final destination of the steel, e.g. in the case of wire for tyres that may be counted in the rubber and chemical industry (part of other industries) or for automotive parts, or wire for welded mesh, that may have been counted in the building industry or in the metal goods industry.

As the use of coated sheets is typically for packaging, there are a number of product branch combinations that are typical. More than 50% of heavy sections are used for structural steel works (37%). Merchant bars are largely consumed within the building industry (64%) and 53% of concrete reinforcing bars are consumed within that branch.

Although electrical engineering accounts for only 5% of total steel consumption, 17% of the consumption of sheets of less than 3mm thickness are used in this industry. Sheets, coated and uncoated account for more than 64% of the steel used. Shipbuilding now accounts for only 1.5% of total steel compared to more than 3% in 1975. However, shipbuilding still accounts for 8% of the consumption of plates $=>3$mm.

Most of final consumption of wire rods can be allocated to the production of metal goods, 68%. However, it has to be taken into account that this quantity represents only 19% of the deliveries of the steel industry, as the deliveries to the first transformation branch of wire and bright drawing accounts for more than 70% of the total. The metal goods branch accounts for 50% of the output of drawn wire. As a result 54% of the output of wire rods of the steel industry will be used directly or indirectly in the metal goods industry. The wire rods and drawn wire branch accounts for 34% of total consumption of coated and uncoated sheets and 32% of hot rolled strip.

About 9% of steel consumption can not be allocated to any of the identified industries. The category of "other industries" comprises activities such as own use within the steel industry, the direct use of the chemical industry, e.g. drawn wire for tyres, direct use in agriculture and various uses such as the local blacksmith. An important part of "other industries" is the mining industry. Mining activities account for most of the consumption of seamless tubes, welded tubes and heavy sections within the "other industries" category, with shares of 21%, 20% and 15% of the total consumption of these products.

Although consumption patterns by branch have not changed very much over time, some developments have been rather pronounced. Most remarkable has been the growth of coated sheets, that in 1974 had a share of only 27% in total sheets (of which about 12% was tinplate). By 1995 the share had grown to 45% (of which 10% was tinplate). The consumption of coated sheets has grown most rapidly in the car industry and for metal products. In both branches, the share of the coated sheets is now over 50%.

Another process of substitution between steel products has been the replacement of hot rolled strip by hot rolled coil, that will have to be slitted by the end user. The share of heavy sections has decreased over time, mainly due to using lighter material, but also because of the use of welded structures.

The replacement of semis for tubes by flat products is also a substitution process. As already discussed seamless tubes have been substituted by welded tubes, a change in the production structure of the branch that has had consequences for the structure of steel inputs into the branch. The share of seamless tubes in total tube consumption decreased from 28% in 1974 to 24% by 1995.

As a more general trend, there has been a shift in final consumption between ECSC and non-ECSC products. The share of non-ECSC products increased from 26% in 1974 to 30% by 1995. For mechanical engineering and for the manufacturing of metal goods the consumption of non-ECSC products was above average with shares of 41.6% and 38.5% respectively.

Development of consumption by branch

Mechanical engineering

There is no clear trend in specific steel consumption for mechanical engineering. Although from 1975 to 1985 specific consumption decreased from 672kg/tonne to 660 kg/tonne, in the period to 1995 there has been an increase to 685kg/tonne. As substitution by other materials is relatively unimportant in the branch, the input of the remaining 400kg/tonne does not include very many other materials, but more parts bought from other branches like electro-motors. Maybe the downsizing of electrical components since 1985 gives an explanation for the increase of the specific steel consumption in the following 10 years. However, the heterogeneous character of the branch makes it very difficult to come to final conclusions.

Electrical engineering

Electrical engineering has been one of the fastest growing branches investigated. However, the fast growth of the branch at nearly 3% per annum, does not show up in a strong increase of the importance of the branch for the steel industry. The share in the total consumption of steel has increased from 4.5% to 4.9%.

Within electrical engineering, specific consumption of ECSC products has been declining by 2.1% a year, and for all steel products by 1.5%. Most of the changes can be attributed to the change in product mix. The share of electromotors and domestic appliances in the total production of the branch declined from 34% in 1982 to 28% by 1992. Based on the change in definition of NACE Rev. 1, comparable figures for 1995 are not available.

The decline in specific consumption during the period 1975-1985 has been much more important than the decline in the following 10 year period. During this period some substitution tendencies could be determined, as there was a clear substitution by plastics, e.g. for the smaller domestic appliances. The change in structure to the more sophisticated products has clearly come to an end. For the last 5 years, even a small increase of specific consumption can be found.

Shipbuilding

There is no clear trend in the development of steel consumption for shipbuilding. The typical character of the branch, is for big changes from year to year in activity and in the types of ships built leading to great variations in specific consumption. After a sharp decrease in 1993, from 459kg/GRT to 328kg/GRT or 29%, two years of increases followed. There are also big differences between the steel consumption for the building of tankers, bulk carriers or roll-on roll-off ferries or other types of ships. But even within a given category of ships, the impact of the size of the ship is very important for the steel consumed. As GRT is a capacity measure it can be assumed that doubling the size of a ship only gives an increase in material consumption of some 66%, and as a consequence a decrease in specific steel consumption equal to 33%.

The importance of the shipbuilding industry for the consumption of steel has faded away. In 1995 the branch accounted for only 1.5% of final steel consumption compared to 4.3% in 1974. This loss was mainly due to the decrease in activity equal to 4.4% a year. The increase of specific consumption in the period up to 1985 was due to the gradual decline of the average size of ships being built, as a consequence of the disappearance of big tankers from the product mix. On the other hand, the increased quality of steel and the strong reduction in tolerances helped to reduce the average thickness of steel plate, whilst at the same time increasing strength and corrosion resistance. Therefore, it may be assumed that there has been a long term decreasing trend in specific steel consumption that for a short period has been overcompensated for by increases due to incidental factors. The observation that the share of plates of over 3mm thickness in total consumption of the branch has been reduced will probably be an effect of this long term decrease of the specific consumption.

Vehicles and other transport

The production of the branch can be divided in three important sections, the production of cars, the production of parts and the production of other vehicles. For the consumption of steel, the first two sectors are by far the most important. These branches are two of the most important customers of the steel industry and accounted in 1995 for nearly 16% of the consumption of ECSC products and nearly 18% of the consumption of non-ECSC products. Besides these direct purchases of steel products, 20% of final steel use is purchased in the form of products of other branches, like the steel cords in tyres.

Specific consumption of steel has declined from 864kg/tonne in 1974/76 to 649kg/tonne in 1993/95. The decline has been the strongest in the period up to 1985, to 735kg/tonne in 1984/86. Over the whole period the decline has been equal to a reduction of 1.5% a year. In reality the decline may have been slightly less, as there may be an increasing share of double counting in the production figures, e.g. the production figures cannot completely be corrected for the deliveries of parts produced and counted in one country to be assembled in other countries.

The decline of specific consumption has not affected all steel products in the same way. There have been reductions for steel castings, some semi-finished steel products, merchant bars and heavy sections. For flat products there has even been a small gain. Steel castings have been substituted for by aluminum, the decline of heavy sections may have been caused by the changes that have occurred in the concept of the car. Part of the decline in specific steel consumption can be explained by a more efficient use of materials. For example, scrap generation decreased considerably, showing up in savings in gross material inputs of more than 20% in the period 1965 to 1985. With the introduction of more automated manufacturing processes, direct savings of material have become more difficult.

The decline of specific steel consumption in the branch therefore does not give a direct indication of the steel actually used in the car. Taking into account the effect of less scrap generation, a more efficient production process and less production of spare parts per car, the decline of the share of steel in the final weight of the car has been about 0.6% a year, a figure that is confirmed by a number of studies carried out on individual types of cars. Detailed study shows that the share of steel in the total weight of German passenger cars has declined from 76% in 1965 to 68% in 1985, a decline equal to 0.5% a year. For France and for the USA similar results are found. This number also gives a good indication of the total effects of a number of substitution processes between the various materials in the car industry, mainly by plastics in parts like bumpers and fuel tanks.

However lowering the total weight of the car, in the period 1975 to 1985 accompanied by the process of downsizing the car, has had much more impact on steel consumption in this branch. With technological developments and an increase in steel qualities, it has been possible now to construct a car with comparable specifications but weighing about 25% less than in 1974. Most of these savings have been realised during the period 1974-1985. Based on the latest developments in steel qualities, steel product properties like tailored blanks and car design, a number of steel companies in collaboration with some car designers have shown that it is possible to construct a car weighing about 30% less, with no concessions with respect to comfort or size.

There have been some changes in the consumption pattern of the car industry. The share of non-ECSC products has grown from 25% to 33%. The share of welded tubes and precision tubes has grown significantly. The share of heavy plates has decreased, as the share of heavy vehicles has also declined and as heavy plates have been substituted for by sheets. To prevent corrosion, the branch uses more and more

coated sheets, as demonstrated by the increase from less than 2.5% of all sheets consumed in 1974 to 50.4%.

Structural steelworks

This branch, that accounts for 10% of the final use of steel, can be subdivided into four sub-branches:

- manufacture of steel structures and parts of structures (bridges, bridge sections, frames, frameworks, superstructures);
- manufacture of builders' carpentry and joinery of metal, gates, doors, windows;
- manufacture of pit propping equipment;
- manufacture of standard-gauge railway track fixtures and fittings, such as building cores, points, pillars, crossings and turn-tables etc.

The share of the branch in the total steel consumption has been growing from 7.8% in 1974 to 9.9% by 1995. Both the production of the branch as well as the specific consumption of steel have developed in a positive manner. The development of each of the four sub-branches has been rather different. The share of the production of mining equipment has decreased continuously. Due to the high specific steel consumption in this sub-branch this has had a negative impact on the specific consumption of the branch. The production of railway track material has also failed to provide a positive impulse to activity.

Increasing competition from aluminum, has led to specific consumption of steel for gates, doors and windows developing with a negative trend. The competition of the plastic industry has reduced steel activity within this sub-branch.

However, the production of bridges and metal structures has shown strong and continuous growth, equal to more than 4% a year. Growth was primarily due to the increase in private commercial and industrial buildings which are mostly steel based. As a result, total production of the branch has been growing by 0.3% a year. Due to autonomous developments within the latter sub-branch, but also due to the increased weight of the sub-branch in the total, specific consumption has increased by 2% a year. Since 1974, steel consumption in the branch has been growing by 2.2%, the highest growth achieved in any of the branches investigated. This growth of steel consumption has been achieved notwithstanding the effects of technological developments and the development of steel qualities. Studies reveal that for the construction of steel bridges, 30% less steel is needed than 20 years ago, for bridges complying to the same criteria of capacity and safety. As both bridges will have a specific steel consumption of 1,000kg/tonne, this type of development is not reflected in the analysis of the specific consumption. A similar conclusion can also be drawn from publications on the Eifel Tower. The tower was built with rolled iron with a total weight of 9,700 tonnes. To build a similar tower using existing materials and techniques would require only 2,000 tonnes, a material saving of 1.6% a year.

Building and civil engineering

The branch of building and civil engineering is composed of a mixture of activities. A common division is to split residential building, non-residential building and civil engineering. Due to the differences in definition and in measurement practices, it is difficult to establish such a division at the EU level. The reported share of civil engineering in total building activity measured by value-added varies from 7% to 32%. As a consequence considerable differences are found in specific consumption between the Member States. By deleting the extremes, we can estimate that the specific consumption of steel for non-residential building is four times the specific consumption for residential building, whereas steel consumption for civil engineering is even less. Therefore, most of the steel is used for non-residential building, far less for residential building and only a small amount for civil engineering.

The building industry, including civil engineering, has grown by 0.8% a year (measured in constant prices). Most of the growth has been due to improvements associated with quality, growth in volume terms has been negative, -0.3% a year.

The building industry accounts for about 19% of total steel use. About 60% of the steel used is merchant bars, mostly concrete reinforcing bars. Of the remaining 40%, wire rods and drawn steel wire are to a great extent also used for strengthening constructions.

Building activity measured in cubic metres shows that specific consumption has recorded increases equal to 3% a year. The increase would have been higher but for the increased quality of steel and the use of strengthened steel in relation to the volume of concrete which has been gradually declining. According to some published studies this effect has been more than 1% a year, especially in the seventies and early eighties.

The increase in the specific consumption may have been due to the shift in the composition of the branch. Steel consumption in non-residential buildings has shown the highest growth, whilst residential buildings report no change in consumption.

Production of metal goods

With the introduction of NACE Rev. 1, some definitions of branches have changed. Most changes will not have had a major impact on the statistics for steel consumption by branch. However, the defintion of the branch "metal goods" in general may have more importance. The movement of metal furniture from "metal goods" to the "furniture" branch has been the most profound change, as the highest steel weight was accounted for by this branch. For the figures presented, we have tried to limit any discrepancy between the old series and the figures for 1995.

The production of the branch further includes the production of nuts, bolts, screws and the production of small tools, cutlery, domestic furnaces and ovens, except electrical, other household appliances and the production of articles of steel wire. Amongst the latter products, the production of welded mesh is also included.

Steel consumption by this branch in 1995 equalled almost 19 million tonnes, or 17% of total steel consumption. The high consumption of wire rod and drawn wire products has already been mentioned. The consumption of sheets equaled 5.7 million tonnes or 18% of final consumption. The share of coated sheets in the total of sheets has been growing, but with 36% (including some tinplate) remains below the general average of 51%.

The specific steel consumption of this branch, after a decline in the period 1975/85 has been growing at a rate of 2.5% a year since. One of the reasons may be the strong growth of office furniture that is more steel intensive than other products within the branch.

The high value found for the specific steel consumption (gross input) shows that output often consists of products made entirely of steel. Therefore the impact of competition with other metals, mainly aluminum has been rather limited. Production of aluminium garden furniture seems not to have had any great impact. Competition within the latter category of products with plastic garden furniture does not show up in the figures, as they are counted as production of rubber and plastic products.

Metal packaging: metal cans and boxes

The figures show that specific consumption of 924kg/tonne is lower than it had been in 1974, although 1985 was a temporary high, due to specific reasons (perhaps related to the expansion of the EU membership). The lowering of the specific consumption is due to some substitution by aluminium. Substitution by plastic bottles is not counted for as the sector is defined as cans and metal boxes, and therefore the production of plastic bottles is not part of the branch. The share of the packaging industry in steel consumption has declined slightly from 3.7% to 3.5%. However, these figures do not reveal the real importance of the branch for the steel industry. Based on high value added for tinplate, the branch accounts for no more than 8% of the sales of the steel industry. The figures do not reveal the tremendous impact in the development of the quality of sheet material. Material thickness of tinplate for beverage cans between 1985 and 1995 was reduced from 0.29mm to 0.25mm, or by 17%. As a result, material savings equal to 1.9% per year were recorded. In the near future, comparable savings are possible using techniques that already exist.

Boilers, tanks, drums and vessels

The production of boilers, tanks, drums and vessels has become less important for the consumption of steel. The share in total consumption has decreased from 5.1% to 4.5%. At the same time there has been an impressive increase in specific steel consumption of this branch from 700kg/tonne to 1,079kg/tonne. This partly reflects a change in the product mix of the branch, e.g. less products for the agricultural business. However, it is also a consequence of the increasing size of installations that are built. This effect is seen in the structure of the steel consumed, as in the last 5 years the dramatic fall in the consumption of plates of over 3mm has been reversed and the decrease observed for heavy sections has also come to an end.

Substitution tendencies explain why the consumption of welded tubes is generally growing much faster than the consumption of seamless tubes. For the construction of boilers and vessels the increase in the consumption of seamless tubes has been predominant. The share of seamless tubes in total tube consumption in 1995 was 42%, as compared to only 37% in 1990.

Steel consumption by user branch in the European Union (1974-1995)

Table 4.2

Steel consumption by user branch, ECSC products, 1995 (thousand tonnes)

	Ingots for tubes	Other semis	Heavy sections	Merchant bars	Wire rod	H.R. narrow strip	Plate >= 3mm	Sheets < 3mm	Coated sheets	Total
Mechanical engineering	104	117	680	1,886	154	381	3,233	1,737	890	9,182
Electrical engineering	2	0	20	189	9	124	331	2,601	896	4,172
Shipbuilding	0	1	72	106	0	4	1,159	35	16	1,393
Vehicles transport	85	47	120	1,066	86	908	1,472	4,135	4,381	12,300
Structural steelwork	6	0	4,109	1,204	79	117	1,601	540	984	8,640
Building & civil engineering	4	2	1,589	11,324	810	114	611	483	1,491	16,428
Metal goods	9	10	42	1,075	2,871	356	1,683	3,659	2,102	11,807
Cans, metal boxes	0	0	0	0	0	0	1	13	3,857	3,871
Boilers, drums, vessels	0	0	149	127	7	161	2,254	983	391	4,072
Other industries	104	179	1,221	611	222	140	1,546	1,253	1,125	6,401
Total	314	355	8,002	17,589	4,238	2,305	13,891	15,439	16,133	78,266

Source: eurostat

Table 4.3

Steel consumption by user branch, non-ECSC products, 1995 (thousand tonnes)

	Steel castings	Forgings	Seamless tubes	Welded tubes	Cold drawn steel	Drawn steel wire	C.R. strip & sections	Pressed, stamped products	Total
Mechanical engineering	409	1,743	907	1,282	808	607	567	206	6,528
Electrical engineering	21	46	9	60	66	305	545	241	1,293
Shipbuilding	37	66	58	72	26	3	50	0	313
Vehicles transport	121	1,388	206	942	856	379	1,132	894	5,919
Structural steelwork	17	34	182	1,406	111	127	560	8	2,445
Building & civil engineering	22	26	305	1,442	101	1,847	994	111	4,848
Metal goods	18	323	65	951	693	3,688	1,499	140	7,376
Cans, metal boxes	0	0	2	0	0	10	28	2	42
Boilers, drums, vessels	3	24	306	433	29	25	81	39	940
Other industries	128	313	542	1,655	229	451	316	30	3,665
Total	776	3,963	2,582	8,244	2,918	7,443	5,771	1,671	33,369

Source: eurostat

Steel consumption by user branch in the European Union (1974-1995)

Table 4.4

Steel consumption by user branch, ECSC products, 1995 (%)

	Ingots for tubes	Other semis	Heavy sections	Merchant bars	Wire rod	H.R. narrow strip	Plate >= 3mm	Sheets < 3mm	Coated sheets	Total
Mechanical engineering	0.7	0.7	4.3	12.0	1.0	2.4	20.6	11.1	5.7	58.4
Electrical engineering	0.0	0.0	0.4	3.5	0.2	2.3	6.1	47.6	16.4	76.3
Shipbuilding	0.0	0.1	4.2	6.2	0.0	0.2	67.9	2.1	0.9	81.6
Vehicles transport	0.5	0.3	0.7	5.9	0.5	5.0	8.1	22.7	24.0	67.5
Structural steelwork	0.1	0.0	37.1	10.9	0.7	1.1	14.4	4.9	8.9	77.9
Building & civil engineering	0.0	0.0	7.5	53.2	3.8	0.5	2.9	2.3	7.0	77.2
Metal goods	0.0	0.1	0.2	5.6	15.0	1.9	8.8	19.1	11.0	61.5
Cans, metal boxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	98.6	99.0
Boilers, drums, vessels	0.0	0.0	3.0	2.5	0.1	3.2	45.0	19.6	7.8	81.2
Other industries	1.0	1.8	12.1	6.1	2.2	1.4	15.4	12.4	11.2	63.6
Total	0.3	0.3	7.2	15.8	3.8	2.1	12.4	13.8	14.5	70.1

Source: eurostat

Table 4.5

Steel consumption by user branch, non-ECSC products, 1995 (%)

	Steel castings	Forgings	Seamless tubes	Welded tubes	Cold drawn steel	Drawn steel wire	C.R. strip & sections	Pressed, stamped products	Total
Mechanical engineering	2.6	11.1	5.8	8.2	5.1	3.9	3.6	1.3	41.6
Electrical engineering	0.4	0.8	0.2	1.1	1.2	5.6	10.0	4.4	23.7
Shipbuilding	2.2	3.9	3.4	4.2	1.5	0.2	2.9	0.0	18.3
Vehicles transport	0.7	7.6	1.1	5.2	4.7	2.1	6.2	4.9	32.5
Structural steelwork	0.2	0.3	1.6	12.7	1.0	1.1	5.1	0.1	22.1
Building & civil engineering	0.1	0.1	1.4	6.8	0.5	8.7	4.7	0.5	22.8
Metal goods	0.1	1.7	0.3	5.0	3.6	19.2	7.8	0.7	38.5
Cans, metal boxes	0.0	0.0	0.1	0.0	0.0	0.3	0.7	0.1	1.1
Boilers, drums, vessels	0.1	0.5	6.1	8.6	0.6	0.5	1.6	0.8	18.8
Other industries	1.3	3.1	5.4	16.4	2.3	4.5	3.1	0.3	36.4
Total	0.7	3.5	2.3	7.4	2.6	6.7	5.2	1.5	29.9

Source: eurostat

Table 4.6

Steel consumption by user branch, ECSC products, 1995 (%)

	Ingots for tubes	Other semis	Heavy sections	Merchant bars	Wire rod	H.R. narrow strip	Plate >= 3mm	Sheets < 3mm	Coated sheets	Total
Mechanical engineering	33.1	33.0	8.5	10.7	3.6	16.5	23.3	11.3	5.5	11.7
Electrical engineering	0.6	0.0	0.2	1.1	0.2	5.4	2.4	16.8	5.6	5.3
Shipbuilding	0.0	0.3	0.9	0.6	0.0	0.2	8.3	0.2	0.1	1.8
Vehicles transport	27.1	13.2	1.5	6.1	2.0	39.4	10.6	26.8	27.2	15.7
Structural steelwork	1.9	0.0	51.3	6.8	1.9	5.1	11.5	3.5	6.1	11.0
Building & civil engineering	1.3	0.6	19.9	64.4	19.1	4.9	4.4	3.1	9.2	21.0
Metal goods	2.9	2.8	0.5	6.1	67.7	15.4	12.1	23.7	13.0	15.1
Cans, metal boxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	23.9	4.9
Boilers, drums, vessels	0.0	0.0	1.9	0.7	0.2	7.0	16.2	6.4	2.4	5.2
Other industries	33.1	50.4	15.3	3.5	5.2	6.1	11.1	8.1	7.0	8.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: eurostat

Table 4.7

Steel consumption by user branch, non-ECSC products, 1995 (%)

	Steel castings	Forgings	Seamless tubes	Welded tubes	Cold drawn steel	Drawn steel wire	C.R. strip & sections	Pressed, stamped products	Total
Mechanical engineering	52.7	44.0	35.1	15.6	27.7	8.2	9.8	12.3	19.6
Electrical engineering	2.7	1.2	0.3	0.7	2.3	4.1	9.4	14.4	3.9
Shipbuilding	4.8	1.7	2.2	0.9	0.9	0.0	0.9	0.0	0.9
Vehicles transport	15.6	35.0	8.0	11.4	29.3	5.1	19.6	53.5	17.7
Structural steelwork	2.2	0.9	7.0	17.1	3.8	1.7	9.7	0.5	7.3
Building & civil engineering	2.8	0.7	11.8	17.5	3.5	24.8	17.2	6.6	14.5
Metal goods	2.3	8.2	2.5	11.5	23.7	49.5	26.0	8.4	22.1
Cans, metal boxes	0.0	0.0	0.1	0.0	0.0	0.1	0.5	0.1	0.1
Boilers, drums, vessels	0.4	0.6	11.9	5.3	1.0	0.3	1.4	2.3	2.8
Other industries	16.5	7.9	21.0	20.1	7.8	6.1	5.5	1.8	11.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: eurostat

Steel consumption by user branch in the European Union (1974-1995)

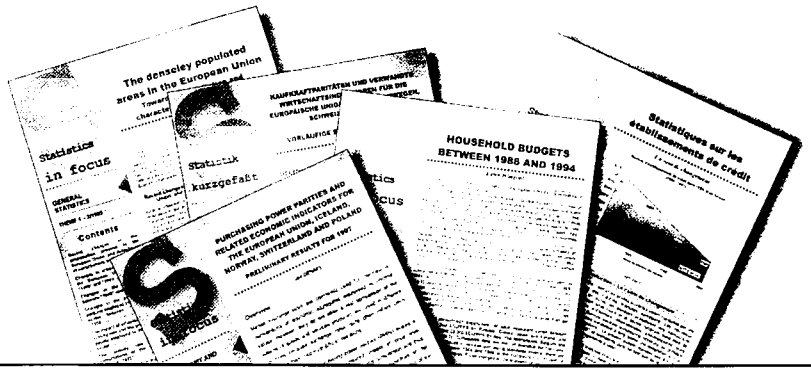
Table 4.8

Steel consumption by user branch

	1974 Steel consumption (1,000 t)	1974 %	1974/76 Spec.st. consum. kg/tonne	1985 Steel consum. (1,000 t)	1985 %	1984/86 Spec.st. consum. kg/tonne	1995 Steel consum. (1,000 t)	1995 %	1993/95 Spec.st. consum. kg/tonne
Mechanical engineering	11,539	13.4	672	10,852	13.6	660	15,709	14.1	685
Electrical engineering	3,883	4.5	340	3,802	4.7	265	5,465	4.9	258
Shipbuilding	3,728	4.3	476 (1)	1,438	1.8	630 (1)	1,707	1.5	430 (1)
Vehicles & oth. transport	14,633	17.0	864	14,469	18.1	735	18,220	16.3	649
Structural steelwork	6,706	7.8	680	6,658	8.3	755	11,085	9.9	917
Building & civil engin.	12,470	14.5	894 (2)	14,115	17.6	1,297 (2)	21,274	19.1	1,380 (2)
Metal goods	13,512	15.7	896	11,301	14.1	814	19,183	17.2	1,007
Cans, metal boxes	3,172	3.7	970	4,034	5.0	1,093	3,913	3.5	924
Boilers, drums, vessels	4,365	5.1	700	3,915	4.9	881	5,011	4.5	1,079
Other industries	12,191	14.1	:	9,470	11.8	:	10,066	9.0	:
Total	86,199	100.0	:	80,054	100.0	:	111,635	100.0	:

1) kg/GRT; kg/BRT; kg/jauge brut.
2) kg/100m³.

Source: eurostat



Statistics in focus

To get straight to the heart of the matter and obtain an effective insight into the reality of the EU Member States, the series of documents entitled *Statistics in focus* offers you rapid and easy access to information on all current trends in Europe.

Statistics in focus: find out, understand and decide in confidence with:

- ★ harmonized, reliable and comparable data on each Member State of the European Union;
- ★ clear and concise comments and analyses;
- ★ charts and maps easy to understand;
- ★ the latest available data.

Statistics in focus is available as single copy or by subscription. Subscriptions are available for one single theme (except themes 7 and 9) or for the whole collection. *Statistics in focus* is available as printed version or as PDF-file sent by e-mail.

Prices on request from the Data Shop network (see end of the publication).

..... Eurostat Data Shops

BELGIQUE/BELGIË

Eurostat Data Shop
Bruxelles / Brussel
Planistat Belgique
124 Rue du Commerce
Handelsstraat 124
B-1000 Bruxelles/Brussel
Tel. (32-2) 234 67 50
Fax (32-2) 234 67 51
E-mail: datashop@planistat.be

DANMARK

Danmarks Statistik
Bibliotek og Information
Eurostat Data Shop
Sejrøgade 11
DK - 2100 KØBENHAVN Ø
Tel. (45-39) 17 30 30
Fax (45-39) 17 30 03
E-mail : bib@dst.dk

DEUTSCHLAND

Statistisches Bundesamt
Eurostat Data Shop Berlin
Otto-Braun-Straße 70-72
D - 10178 BERLIN
Tel. (49-30) 2324 6427/28
Fax (49-30) 2324 6430
E-mail:
datashop@statistik-bund.de

ESPAÑA

INE
Eurostat Data Shop
Paseo de la Castellana 183
Oficina 009
Entrada por Estébanez
Calderón
E - 28046 MADRID
Tel. (34-91) 583 91 67
Fax (34-91) 579 71 20
E-mail:
datashop.eurostat@ine.es

FRANCE

INSEE Info Service
Eurostat Data Shop
195, rue de Bercy
Tour Gamma A
F - 75582 PARIS CEDEX 12
Tel. (33-1) 53 17 88 44
Fax (33-1) 53 17 88 22
E-mail : datashop@insee.fr

ITALIA — ROMA

ISTAT — Centro di Informazione Statistica — Sede di Roma
Eurostat Data Shop
Via Cesare Balbo 11a
I - 00184 ROMA
Tel. (39-06) 46 73 31 02/06
Fax (39-06) 46 73 31 01/07
E-mail: dipdiff@istat.it

ITALIA — MILANO

ISTAT — Ufficio Regionale per la Lombardia
Eurostat Data Shop
Via Fieno 3
I - 20123 MILANO
Tel. (39-02) 8061 32 460
Fax (39-02) 8061 32 304
E-mail: Mileuro@tin.it

LUXEMBOURG

Eurostat Data Shop Luxembourg
BP 453
L - 2014 LUXEMBOURG
4, rue A. Weicker
L - 2721 LUXEMBOURG
Tel. (352) 43 35 22-51
Fax (352) 43 35 22 221
E-mail:
dslux@eurostat.datashop.lu

NEDERLAND

Statistics Netherlands
Eurostat Data Shop - Voorburg
po box 4000
NL - 2270 JM VOORBURG
Tel. (31-70) 337 49 00
Fax (31-70) 337 59 84
E-mail: datashop@cbs.nl

PORTUGAL

Eurostat Data Shop Lisboa
INE / Serviço de Difusão
Av. António José de Almeida, 2
P - 1000-043 LISBOA
Tel. (351-21) 842 61 00
Fax (351-21) 842 63 64
E-mail: data.shop@ine.pt

SUOMI/FINLAND

Statistics Finland
Eurostat Data Shop Helsinki
Tilastokirjasto
PL 2B
00022 Tilastokeskus
Työpajakatu 13 B, 2 krs,
Helsinki
Tel. (358-9) 1734 22 21
Fax (358-9) 1734 22 79
E-mail: datashop.tilastokeskus@
tilastokeskus.fi
Internet:
http://www.tilastokeskus.fi/tk/k
k/datashop.html

SVERIGE

Statistics Sweden
Information service
Eurostat Data Shop
Karlavägen 100
Box 24 300
S - 104 51 STOCKHOLM
Tel. (46-8) 5069 48 01
Fax (46-8) 5069 48 99
E-mail : infoservice@scb.se
URL: http://www.scb.se/info/
datashop/eudatashop.asp

UNITED KINGDOM

Eurostat Data Shop
Enquiries & advice and publications
Office for National Statistics
Customers and Electronic Services
Unit B1/05
1 Drummond Gate
UK - LONDON SW1V 2QQ
Tel. (44-171) 533 56 76
Fax (44-1633) 81 27 62
E-mail:
eurostat.datashop@ons.gov.uk

Electronic Data Extractions, enquiries & advice
r.cade
1L Mountjoy Research Centre
University of Durham
UK-Durham DH1 3SW
Tel. (44-191) 374 7350
Fax (44-191) 384 4971
E-mail: r-cade@dur.ac.uk
Internet: http://www-
rcade.dur.ac.uk

NORGE

Statistics Norway
Library and Information Centre
Eurostat Data Shop
Kongens gate 6
P.O.Box 8131 Dep.
N-0033 OSLO
Tel. (47-22) 86 46 43
Fax (47-22) 86 45 04
E-mail: Datashop@ssb.no

SCHWEIZ/SUISSE/SVIZZERA

Statistisches Amt des Kantons Zürich
Eurostat Data Shop
Bleicherweg 5
CH-8090 Zürich
Tel. (41-1) 225 12 12
Fax (41-1) 225 12 99
E-mail: datashop@zh.ch
Internet:
http://www.zh.ch/statistik

UNITED STATES OF AMERICA

Haver Analytics
Eurostat Data Shop
60 East 42nd Street
Suite 3310
NEW YORK, NY 10165
Tel. (1-212) 986 9300
Fax (1-212) 986 5857
E-mail: eurodata@haver.com

EUROSTAT HOMEPAGE
www.europa.eu.int/comm/eurostat /

MEDIA SUPPORT EUROSTAT
(Nur für Journalisten — only for professional journalists — seulement pour les journalistes professionnels)
Postanschrift — Postal address — Adresse postale:
Bâtiment Jean Monnet
L-2920 LUXEMBOURG
Bâtiment Bech — A3/48
5, rue Alphonse Weicker
L-2721 Luxembourg
Tel. (352) 43 01-33408
Fax (352) 43 01-32649
E-Mail: media.support@cec.eu.int

Venta • Salg • Verkauf • Πωλήσεις • Sales • Vente • Vendita • Verkoop • Venda • Myynti • Försäljning

BELGIQUE/BELGIË

Jean De Lannoy
Avenue du Roi 202/Koningslaan 202
B-1190 Bruxelles/Brussel
Tél. (32-2) 538 43 08
Fax (32-2) 538 08 41
E-mail: jean.de.lannoy@infoboard.be
URL: http://www.jean-de-lannoy.be

La librairie européenne/ De Europese Boekhandel
Rue de la Loi 244/Wetstraat 244
B-1040 Bruxelles/Brussel
Tél. (32-2) 295 26 39
Fax (32-2) 735 08 60
E-mail: mail@libeurop.be
URL: http://www.libeurop.be

Moniteur belge/Belgisch Staatsblad
Rue de Louvain 40-42/Leuvenseweg 40-42
B-1000 Bruxelles/Brussel
Tél. (32-2) 552 22 11
Fax (32-2) 511 01 84

DANMARK

J. H. Schultz Information A/S
Herstedvang 12
DK-2620 Albertslund
Tlf. (45) 43 63 23 00
Fax (45) 43 63 19 69
E-mail: schultz@schultz.dk
URL: http://www.schultz.dk

DEUTSCHLAND

Bundesanzeiger Verlag GmbH
Vertriebsabteilung
Amsterdamer Straße 192
D-50735 Köln
Tel. (49-221) 97 66 80
Fax (49-221) 97 66 82 78
E-Mail: vertrieb@bundesanzeiger.de
URL: http://www.bundesanzeiger.de

ΕΛΛΑΔΑ/GREECE

G. C. Eleftheroudakis SA
International Bookstore
Panepistimiou 17
GR-10564 Athina
Tel. (30-1) 331 41 80/1/2/3/4/5
Fax (30-1) 323 98 21
E-mail: elebooks@netor.gr

ESPAÑA

Boletín Oficial del Estado
Trafalgar, 27
E-28071 Madrid
Tel. (34) 915 38 21 11 (Libros),
913 84 17 15 (Suscrip.)
Fax (34) 915 38 21 21 (Libros),
913 84 17 14 (Suscrip.)
E-mail: clientes@com.boe.es
URL: http://www.boe.es

Mundi Prensa Libros, SA
Castelló, 37
E-28001 Madrid
Tel. (34) 914 36 37 00
Fax (34) 915 75 39 98
E-mail: libreria@mundiprensa.es
URL: http://www.mundiprensa.com

FRANCE

Journal officiel
Service des publications des CE
26, rue Desaix
F-75727 Paris Cedex 15
Tél. (33) 140 58 77 31
Fax (33) 140 58 77 00
E-mail: europublications@journal-officiel.gouv.fr
URL: http://www.journal-officiel.gouv.fr

IRELAND

Government Supplies Agency
Publications Section
4-5 Harcourt Road
Dublin 2
Tel. (353-1) 661 31 11
Fax (353-1) 475 27 60
E-mail: opw@iol.ie

ITALIA

Licosa SpA
Via Duca di Calabria, 1/1
Casella postale 552
I-50125 Firenze
Tel. (39) 055 64 83 1
Fax (39) 055 64 12 57
E-mail: licosa@licosa.com
URL: http://www.licosa.com

LUXEMBOURG

Messageries du livre SARL
5, rue Raiffeisen
L-2411 Luxembourg
Tél. (352) 40 10 20
Fax (352) 49 06 61
E-mail: mail@mdl.lu
URL: http://www.mdl.lu

NEDERLAND

SDU Servicecentrum Uitgevers
Christoffel Plantijnstraat 2
Postbus 20014
2500 EA Den Haag
Tel. (31-70) 378 98 80
Fax (31-70) 378 97 83
E-mail: sdu@sdu.nl
URL: http://www.sdu.nl

ÖSTERREICH

Manz'sche Verlags- und Universitätsbuchhandlung GmbH
Kohlmarkt 16
A-1014 Wien
Tel. (43-1) 53 16 11 00
Fax (43-1) 53 16 11 67
E-Mail: bestellen@manz.co.at
URL: http://www.manz.at

PORTUGAL

Distribuidora de Livros Bertrand Ld.ª
Grupo Bertrand, SA
Rua das Terras dos Vales, 4-A
Apartado 60037
P-2700 Amadora
Tel. (351) 214 95 87 87
Fax (351) 214 96 02 55
E-mail: dlb@ip.pt

Imprensa Nacional-Casa da Moeda, SA
Rua da Escola Politécnica nº 135
P-1250 -100 Lisboa Codex
Tel. (351) 213 94 57 00
Fax (351) 213 94 57 50
E-mail: spoce@incm.pt
URL: http://www.incm.pt

SUOMI/FINLAND

Akateeminen Kirjakauppa/ Akademiska Bokhandeln
Keskuskatu 1/Centralgatan 1
PL/PB 128
FIN-00101 Helsinki/Helsingfors
P./tfn (358-9) 121 44 18
F./fax (358-9) 121 44 35
Sähköposti: sps@akateeminen.com
URL: http://www.akateeminen.com

SVERIGE

BTJ AB
Traktorvägen 11
S-221 82 Lund
Tlf. (46-46) 18 00 00
Fax (46-46) 30 79 47
E-post: btjeu-pub@btj.se
URL: http://www.btj.se

UNITED KINGDOM

The Stationery Office Ltd
Orders Department
PO Box 276
London SW8 5DT
Tel. (44-171) 870 60 05-522
Fax (44-171) 870 60 05-533
E-mail: book.orders@theso.co.uk
URL: http://www.tsonline.co.uk

ÍSLAND

Bokabud Larusar Blöndal
Skólavördustig, 2
IS-101 Reykjavik
Tel. (354) 552 55 40
Fax (354) 552 55 60
E-mail bokabud@simnet.is

NORGE

Swets Norge AS
Ostenjoveien 18
Boks 6512 Etterstad
N-0606 Oslo
Tel. (47-22) 97 45 00
Fax (47-22) 97 45 45
E-mail: kytterlid@swets.nl

SCHWEIZ/SUISSE/SVIZZERA

Euro Info Center Schweiz
c/o OSEC
Stampfenbachstraße 85
PF 492
CH-8035 Zürich
Tel. (41-1) 365 53 15
Fax (41-1) 365 54 11
E-mail: eics@osec.ch
URL: http://www.osec.ch/eics

BĂLGARIJA

Europress Euromedia Ltd
59, blvd Vitosha
BG-1000 Sofia
Tel. (359-2) 980 37 66
Fax (359-2) 980 42 30
E-mail: Milena@mbox.cit.bg

ČESKÁ REPUBLIKA

ÚSIS
NIS-prodejna
Havelkova 22
CZ-130 00 Praha 3
Tel. (420-2) 24 23 14 86
Fax (420-2) 24 23 11 14
E-mail: voldanovaj@usiscr.cz
URL: http://usiscr.cz

CYPRUS

Cyprus Chamber of Commerce and Industry
PO Box 1455
CY-1509 Nicosia
Tel. (357-2) 66 95 00
Fax (357-2) 66 10 44
E-mail: demetrap@ccci.org.cy

EESTI

Eesti Kaubandus-Tööstuskoda
(Estonian Chamber of Commerce and Industry)
Toom-Kooli 17
EE-0001 Tallinn
Tel. (372) 646 02 44
Fax (372) 646 02 45
E-mail: einfo@koda.ee
URL: http://www.koda.ee

HRVATSKA

Mediatrade Ltd
Pavla Hatza 1
HR-10000 Zagreb
Tel. (385-1) 481 94 11
Fax (385-1) 481 94 11

MAGYARORSZÁG

Euro Info Service
Hungexpo Európa Ház
PO Box 44
H-1441 Budapest
Tel. (36-1) 264 82 70
Fax (36-1) 264 82 75
E-mail: euroinfo@euroinfo.hu
URL: http://www.euroinfo.hu

MALTA

Miller Distributors Ltd
Malta International Airport
PO Box 25
Luqa LQA 05
Tel. (356) 66 44 88
Fax (356) 67 67 99
E-mail: gwirth@usa.net

POLSKA

Ars Polona
Krakowskie Przedmiescie 7
Skr. pocztowa 1001
PL-00-950 Warszawa
Tel. (48-22) 826 12 01
Fax (48-22) 826 62 40
E-mail: books119@arspolona.com.pl

ROMÂNIA

Euromedia
Strada Franceza Nr 44 sector 3
RO-70749 Bucuresti
Tel. (40-1) 315 44 03
Fax (40-1) 315 44 03
E-mail: mnedelciu@pcnet.pcnet.ro

ROSSIYA

CCEC
60-letiya Oktyabrya Av. 9
117312 Moscow
Tel. (7-095) 135 52 27
Fax (7-095) 135 52 27

SLOVAKIA

Centrum VTI SR
Nám. Slobody, 19
SK-81223 Bratislava
Tel. (421-7) 54 41 83 64
Fax (421-7) 54 41 83 64
E-mail: europ@tbb1.sltk.stuba.sk
URL: http://www.sltk.stuba.sk

SLOVENIJA

Gospodarski Vestnik
Dunajska cesta 5
SLO-1000 Ljubljana
Tel. (386) 613 09 16 40
Fax (386) 613 09 16 45
E-mail: europ@gvestnik.si
URL: http://www.gvestnik.si

TÜRKIYE

Dünya Infotel AS
100, Yil Mahallessi 34440
TR-80050 Bagcilar-Istanbul
Tel. (90-212) 629 46 89
Fax (90-212) 629 46 27
E-mail: infotel@dunya-gazete.com.tr

AUSTRALIA

Hunter Publications
PO Box 404
3067 Abbotsford, Victoria
Tel. (61-3) 94 17 53 61
Fax (61-3) 94 19 71 54
E-mail: jpdavies@ozemail.com.au

CANADA

Les éditions La Liberté Inc.
3020, chemin Sainte-Foy
G1X 3V6 Sainte-Foy, Québec
Tel. (1-418) 658 37 63
Fax (1-800) 567 54 49
E-mail: liberte@mediom.qc.ca

Renouf Publishing Co. Ltd
5369 Chemin Canotek Road Unit 1
K1J 9J3 Ottawa, Ontario
Tel. (1-613) 745 26 65
Fax (1-613) 745 76 60
E-mail: order.dept@renoufbooks.com
URL: http://www.renoufbooks.com

EGYPT

The Middle East Observer
41 Sherif Street
Cairo
Tel. (20-2) 392 69 19
Fax (20-2) 393 97 32
E-mail: inquiry@meobserver.com
URL: http://www.meobserver.com.eg

INDIA

EBIC India
3rd Floor, Y. B. Chavan Centre
Gen. J. Bhosale Marg.
400 021 Mumbai
Tel. (91-22) 282 60 64
Fax (91-22) 285 45 64
E-mail: ebic@giasbm01.vsnl.net.in
URL: http://www.ebicindia.com

JAPAN

PSI-Japan
Asahi Sanbancho Plaza #206
7-1 Sanbancho, Chiyoda-ku
Tokyo 102
Tel. (81-3) 32 34 69 21
Fax (81-3) 32 34 69 15
E-mail: books@psi-japan.co.jp
URL: http://www.psi-japan.co.jp

MALAYSIA

EBIC Malaysia
Level 7, Wisma Hong Leong
18 Jalan Perak
50450 Kuala Lumpur
Tel. (60-3) 21 62 62 98
Fax (60-3) 21 62 61 98
E-mail: ebic-kl@mol.net.my

MÉXICO

Mundi Prensa Mexico, SA de CV
Río Pánuco No 141
Colonia Cuauhtémoc
MX-06500 Mexico, DF
Tel. (52-5) 533 56 58
Fax (52-5) 514 67 99
E-mail: 101545.2361@compuserve.com

PHILIPPINES

EBIC Philippines
19th Floor, PS Bank Tower
Sen. Gil J. Puyat Ave. cor. Tindalo St.
Makati City
Metro Manilla
Tel. (63-2) 759 66 80
Fax (63-2) 759 66 90
E-mail: eccpcom@globe.com.ph
URL: http://www.eccp.com

SOUTH AFRICA

Eurochamber of Commerce in South Africa
PO Box 781738
2146 Sandton
Tel. (27-11) 884 39 52
Fax (27-11) 883 55 73
E-mail: info@eurochamber.co.za

SOUTH KOREA

The European Union Chamber of Commerce in Korea
5th Fl, The Shilla Hotel
202, Jangchung-dong 2 Ga, Chung-ku
100-392 Seoul
Tel. (82-2) 22 53-5631/4
Fax (82-2) 22 53-5635/6
E-mail: eucck@eucck.org
URL: http://www.eucck.org

SRI LANKA

EBIC Sri Lanka
Trans Asia Hotel
115 Sir chittampalam
A. Gardiner Mawatha
Colombo 2
Tel. (94-1) 074 71 50 78
Fax (94-1) 44 87 79
E-mail: ebicsl@itmin.com

THAILAND

EBIC Thailand
29 Vanissa Building, 8th Floor
Soi Chidlom
Ploenchit
10330 Bangkok
Tel. (66-2) 655 06 27
Fax (66-2) 655 06 28
E-mail: ebicbkk@ksc15.th.com
URL: http://www.ebicbkk.org

UNITED STATES OF AMERICA

Bernan Associates
4611-F Assembly Drive
Lanham MD20706
Tel. (1-800) 274 44 47 (toll free telephone)
Fax (1-800) 865 34 50 (toll free fax)
E-mail: query@bernan.com
URL: http://www.bernan.com

ANDERE LÄNDER/OTHER COUNTRIES/ AUTRES PAYS

Bitte wenden Sie sich an ein Büro Ihrer Wahl/ Please contact the sales office of your choice/ Veuillez vous adresser au bureau de vente de votre choix

Office for Official Publications of the European Communities
2, rue Mercier
L-2985 Luxembourg
Tel. (352) 29 29-42455
Fax (352) 29 29-42758
E-mail: info.info@cec.eu.int
URL: http://eur-op.eu.int

8 17 KS-AM-00-012-EN-C

Price (excluding VAT) in Luxembourg:
Single copy: EUR 17
Subscription: EUR 162

OFFICE FOR OFFICIAL PUBLICATIONS
OF THE EUROPEAN COMMUNITIES

L-2985 Luxembourg