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The European Union Steel Industry: From a National to a Regional Industry

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Global Political Economy (GPE) Research Group

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The aims of the project are to:

1. Promote Lifelong Learning within the European Steel Industry
2. Support workers' adjustment to new ways of working.
3. Promote equal opportunities.
4. Support workers' adjustment to new technologies.
5. Provide workers with transferable skills.

In meeting these aims the project undertook the following:

1. Mapped existing qualifications using new and existing research to ascertain the level of need in new and transferable skills.
2. Developed transnational qualification modules comprising new and transferable skills.
3. Developed an on-line training programme.

The duration of the project was three years, from December 2000 to November 2003.

The research for the Reports was undertaken by: Peter Fairbrother, Dean Stroud, Amanda Coffey, Jan Clark, Jenifer Daley, Nikolaus Hammer and Steve Davies, with contributions from all partners.

The Reports are:

1. New Steel Industry Challenges
2. The Internationalisation of the World Steel Industry.
3. The European Steel Industry: From a National to a Regional Industry.
4. The Changing European Steel Workforce.
5. Skills, Qualifications and Training in the German Steel Industry: A Case Study
6. Skills, Qualifications and Training in the Italian Steel Industry: A Case Study
7. Skills, Qualifications and Training in the Netherlands Steel Industry: A Case Study
8. Skills, Qualifications and Training in the Polish Steel Industry: A Case Study
9. Skills, Qualifications and Training in the British Steel Industry: A Case Study
10. Future Skill Needs in the European Steel Industry
11. Training and Qualifications in the European Steel Industry.
12. The Question of pan-European Vocational Qualifications
13. Equality and Diversity in the European Steel Industry

The European Union Steel Industry: From a National to a Regional Industry

Introduction

The steel industry is organised into sets of regional blocks or clusters, particularly for production, but also for trade. One of the best examples of this type of clustering is provided by the modern European steel industry, where companies are organised principally in relation to Europe and where trade outside the bloc is limited. This industry has its roots in the development of manufacturing industry in the late nineteenth century. Iron and steel production and consumption became the cornerstone of many European economies, throughout the twentieth century. During this period, the iron and steel industry was either state owned, seen as one of the strategic industries or highly regulated.

The historical basis of the European clustering of iron and steel lies in the establishment of the European Coal and Steel Community (ECSC), under the Treaty of Paris, signed on 18 April 1951 by Belgium, Germany, France, Italy, Luxembourg and the Netherlands. Historically, the ECSC was the practical follow-up to the Schuman Declaration of 9 May 1950, which proposed placing Franco-German production of coal and steel under a common High Authority. Subsequently, the membership of the ECSC was expanded as the EU evolved and developed. The Treaty expired on 23 July 2002, after a fifty year life from the actual establishment of the ECSC on 23 July 1952. This Treaty was the forerunner of the subsequent treaties that underpin the modern European Union.

The ECSC established the foundations for a common market for coal and steel, and involving the setting up of a distinctive inter-governmental processes which eventually resulted in the modern EU. While there is debate about the origins and driving force of the ECSC (Duchene, 1995; Milward *et al.*, 1993), the ECSC was viewed as a success by its supporters, enabling increased output and, when over capacity became a problem after 1959, facilitating labour retraining and transfer on a massive scale. Although the politics surrounding the formulation of the Treaty and subsequent developments have been highly contested, it is also the case that the ECSC has been a cornerstone of the European industry, until the expiry of the Treaty in 2002 (Mioche, 1998).

The foundation for the EU steel industry as a regional industry was laid in the 1980s and 1990s when the deregulation of the industry began, involving privatisation of the industry and the associated moves toward the establishment of a more internationally focused industry. Within Europe, this has resulted in major institutional changes, with a restructuring of the industry that includes increased emphasis on productivity, technological innovation and development, an emphasis on down-stream activity and a recomposition of the industry via mergers and acquisitions. In effect, the foundations were laid for the emergence of an embryonic globalised industry, with the European steel region a key component in this process. Such developments are likely to have major consequences for the organisation of labour, the skills profile, and training.

The argument presented in this Report is that the European steel industry is on a cusp, moving from a largely nationally-based industry to one where the major companies are transforming into major steel multinationals, with a strong regional focus. One implication of this development is that while the national governments that make up the EU still see steel as a major national industry, the reality is that the principal companies in Europe are no longer reliant on national economic policy and support. As these changes proceed then it is likely that the occupational skill profile of the European steel workforce will come to the fore, as will questions about labour mobility and

employability. It is in this latter respect that the industry is likely to remain at the centre stage of government policy concerned with economic restructuring.

The Report comprises five sections. In the first section, the patterns of European steel production, consumption and trade are presented. This examination develops a picture of the importance of the steel industry to European economies. In section two, the place of large steel producers in this process is presented, pointing to the structural and institutional changes that are beginning to take place. In section four, the implications of these developments for labour are considered. An assessment of this brief history makes up the final section.

Section One: European Steel Production, Consumption and Trade

Steel production has been a cornerstone of European industry for more than a century. While this industry has been nationally based and focused largely on Europe, increasingly it is part of a broader set of trade relations. The patterns of production, consumption and trade suggest an increasingly internationalised industry.

Production

The EU has been the focus of steel production for the last fifty years. As an industry it has been extensively reorganised resulting in higher overall output in crude steel production over the last decade. However, this increase involves particular countries in differential ways, as indicated in Table One.

Table 1: The Ten Largest EU Steel Producing Countries, 1992 – 2000
(million metric tons crude steel production)

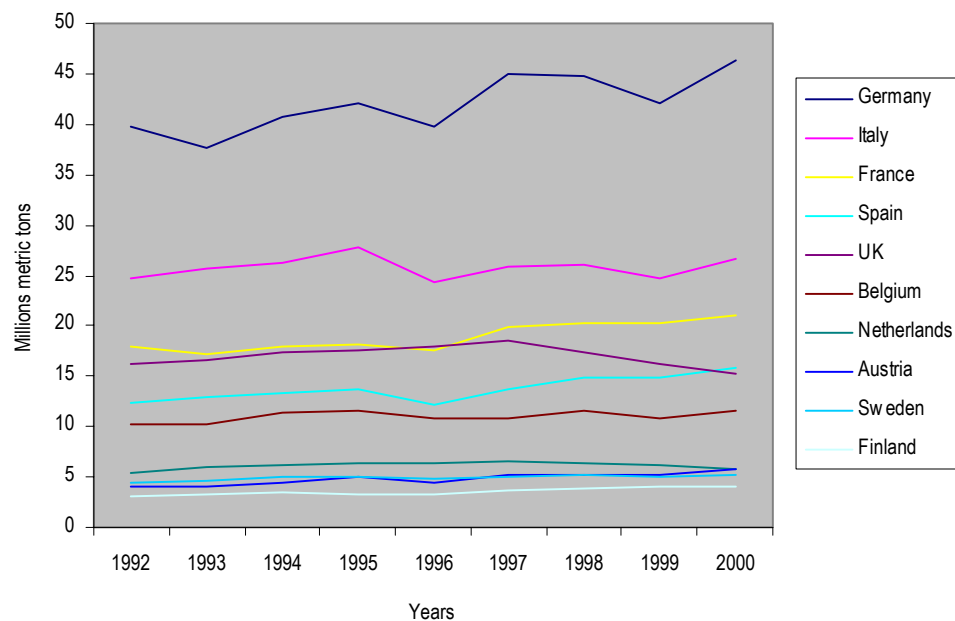
		Steel Produced (million m/t)								
Country	Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
Germany		40	38	41	42	40	45	45	42	46
Italy		25	26	26	28	24	26	26	25	27
France		18	17	18	18	18	20	20	20	21
Spain		12	13	13	14	12	14	15	15	16
UK		16	17	17	18	18	19	17	16	15
Belgium		10	10	11	12	11	11	12	11	12
Netherlands		5	6	6	6	6	7	6	6	6
Austria		4	4	4	5	4	5	5	5	6
Sweden		4	5	5	5	5	5	5	5	5
Finland		3	3	3	3	3	4	4	4	4
Total EU		136	142	149	153	144	157	158	152	160
Turkey		10	12	13	13	14	15	14	14	14
Poland		10	10	11	12	10	12	10	9	11
Total EU +		156	163	173	178	168	183	182	175	185

Source: International Iron and Steel Institute Reports

Germany is the largest producer of crude steel, followed by Italy and France. However, this is an industry that is operating in an increasingly uncertain environment, in relation to investment, trade and related conditions. The recent slowing down of the Germany economy during the late 1990s, the largest European steel producer and consumer, is likely to impact on other European economies.

These trends are presented and discussed below:

Figure 1: Trends in production in the EU Region, 1992 – 2000
(million metric tons crude steel production)



Source: International Iron and Steel Institute Reports

As indicated in Figure One, Germany remains the largest producer with output on a broadly upward trajectory. While there are increases in production levels in all other countries, Spain shows the largest proportionate increase.

What is of note is that the European steel industry no longer operates in isolation from other international economies. As a result, decisions made in the US in 2002 to protect its integrated steel industry directly affect the sale of European steel. Likewise, recent developments in Brazil and Argentina are likely to have an impact on the Spanish economy. While there has been some recovery from the economic crisis that beset the Asian region in 1997, it is still the case that there is an on-going impact on in terms of world trade.

Of more immediacy, there is a complex relation between EU steel production and the steel industries in transition in Central and Eastern Europe and the former Soviet Union. While

production of steel has collapsed following the demise of the Soviet bloc, there are still a number of important producers in the region, who are looking to the EU as a potential market. In addition, many of the Central and Eastern European countries have acquired accession status to the EU with the prospect that the current EU cluster is likely to evolve in distinctive and unanticipated ways.

The production pattern of selected Central and Eastern European countries is as follows:

Table 2: Central/East European and former the former Soviet Union, 1989 and 2000
(million metric tons crude steel production)

Region	Country	1989	2000
<i>Central and Eastern Europe</i>	Poland	15.1	10.5
	Czech Republic	15.4	6.2
	Slovak Republic		3.7
	Romania	14.4	4.8
<i>Former Soviet</i>	Russia	-	59.1
	Ukraine	-	15.5
	Kazakhstan	-	4.8
<i>Total Former Soviet</i>		160.1	98.0 (est.)

Source: International Iron and Steel Institute Reports

There has been an extensive shrinkage of the markets in these countries as these states have undergone massive restructuring and reorganisation. These industries were previously production led, and were at the heart of the former Communist economies. Enterprises were managed in functional ways, with almost no experience in marketing such products and limited forms of accounting in operation. There is some evidence of corrupt practices, in both supply and export. The outcome is that this is an industry, characterised by extensive overstaffing. These industries suffer from operational inefficiencies, reflected in an absence of energy management in energy demanding industries.

In these circumstances, the EU steel production industry faces challenges, which mean that there is uncertainty about the future. It is an industry that has been central to the development of the modern EU economy. However, it is also an industry that is undergoing major change, as the former tight clustering of the industry begins to breakdown.

Consumption

The three major European steel producing countries are also the major consumers of crude steel, as indicated in Table Three.

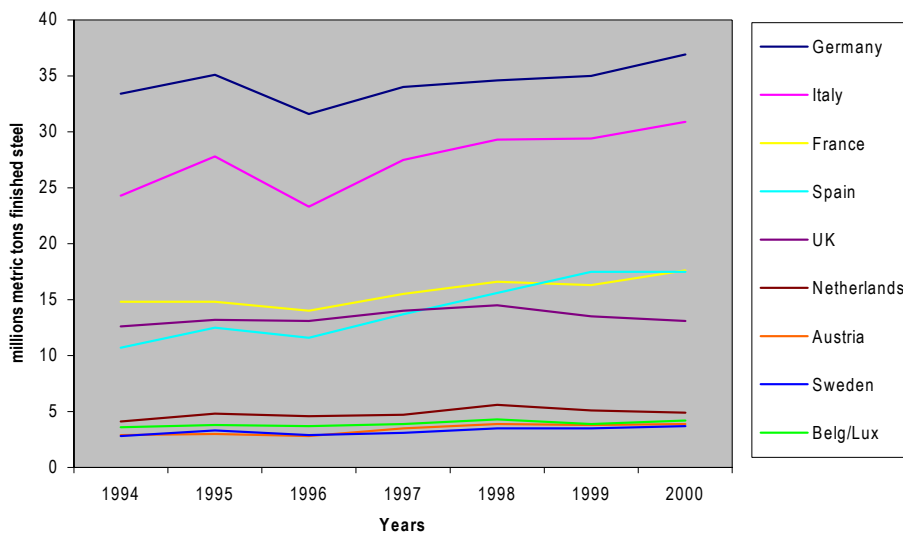
Table 3: The Ten Largest EU Consumer Countries, 1994-2000
(million metric tons crude steel)

		Steel Consumed (million m/t)						
Country	Year	1994	1995	1996	1997	1998	1999	2000
Germany		33	35	32	34	35	35	37
Italy		24	28	23	28	29	29	31
France		15	15	14	16	17	16	18
Spain		11	13	12	14	16	18	18
UK		13	13	13	14	15	14	13
Netherlands		4	5	5	5	6	5	5
Austria		3	3	3	4	4	4	4
Sweden		3	3	3	3	4	4	4
Belg/Lux		4	4	4	4	4	4	4
Total EU		116	127	116	130	138	138	144
Turkey		7	10	10	12	12	11	12
Poland		5	6	6	6	7	7	8
Total EU +		129	144	132	148	157	156	164

Source: International Iron and Steel Institute Reports

The trend in steel consumption in the European area, as indicated by the consumption patterns of the ten major steel consuming countries is upwards, as indicated in Figure Two.

Figure 2: Trends among Major EU Steel Consumers, 1994 - 2000



Source: International Iron and Steel Institute Reports

With the exception of the UK, steel consumption in these major EU countries is broadly upwards.

The EU is also a large worldwide consumer of steel, accounting for almost fifth of global demand in 2000, as indicated in Table Four.

Table 4: Steel Consumption by European Countries, 2000

Country	Consumption (million mt, finished steel products)	Region percentage of World total
Austria	3.9	
Belgium/Luxembourg	4.2	
France	17.6	
Germany	36.9	
Italy	30.9	
Netherlands	4.9	
Spain	17.5	
Sweden	3.7	
UK	13.1	
Other	11.1	
European Union	143.8	18.6
Czech Republic	3.9	
Poland	7.5	
Romania	2.3	
Turkey	12.4	
Russia	23.0	
Ukraine	9.7	
Other	16.0	
Eastern Europe/CIS	74.8	9.7
World (m/t)	768.8	

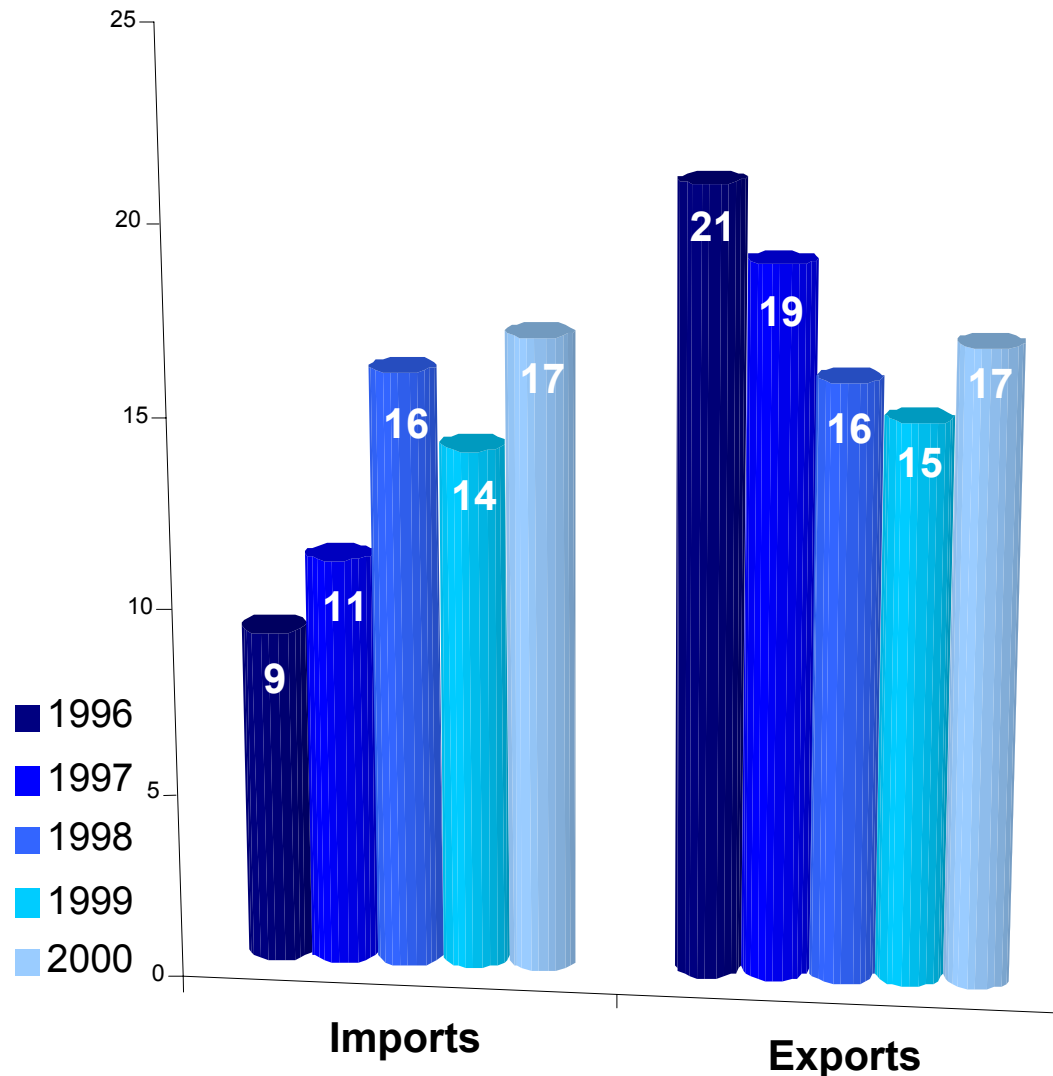
Source: International Iron and Steel Institute Reports

When steel consumption by east European countries and the Commonwealth of Independent States (CIS) is included in the overall figure of European steel consumption rises to 28.3 per cent. Europe is also a significant player in steel trade, EU countries traded some 75.1 mt of the 281.6 mt traded internationally in 1999. Since 1999 the EU has also returned to being a net steel exporter, although at 1.3mt this is marginal. Elsewhere in Europe 'Other European' countries and the former USSR also reported trade surpluses.

Trade Relations

The EU steel industry is thus becoming an internationalised industry. This development is indicated by the pattern of steel imports and exports in the EU industry. These are presented in Figure Three.

Figure 3: Imports and exports in the EU steel industry, 1996 – 2000 (million metric tons)



Source: Gibellieri, E. *The Future of Steel in Europe: A general overview of main trends, privatizations, mergers, technologies*, Presentation to Steel Conference, Cardiff University, April 2002

Over the last few years there has been an increased degree of steel imports into EU countries, probably reflecting the ready availability of steel from the Central/Eastern European countries as well as from the former Soviet Union.

It would also appear to be the case that while imports are increasing, covering sectors such as construction, automotive, mechanical engineering and domestic appliances, exports as a proportion of total steel consumption is declining. However, the critical point to note is that this changing pattern of production and consumption is occurring in an increasingly internationalised world, with a greater range of steel producers and consumption in regions that were minor consumers in the past.

EU Steel Companies

Central to the thesis that the EU steel industry is undergoing a transition from a nationally-based to an internationally focused industry are the European steel companies. If these companies are becoming international in their focus and their organisation then the thesis is supported, since the EU steel industry is a core component of world steel production and consumption. In considering this dimension, it is necessary to consider the institutional organisation and reorganisation of these companies, patterns of concentration and changes in output, and especially the focus on downstream activity.

Until recently, the production of steel in Europe was undertaken principally by five European based companies: Arbed, Usinor, Corus, ThyssenKrupp and Riva. However, a relatively small proportion of their output would have been outside Europe however. In 2000, the output of the ten largest companies in the EU was as follows:

Table 5: The Ten Largest Steel Producing Companies in the EU, 1999 and 2000
(millions metric tons crude steel output)

No.	Company	Country of Origin	World Rank 1999	Production 1999	World Rank 2000	Production 2000
1	Arbed ¹	Luxembourg	3	22.2	3	24.1
2	Usinor ¹	France	4	22.2	5	21.0
3	Corus	UK / Netherlands	5	21.3	6	20.0
4	Thyssen Krupp	Germany	8	16.1	7	17.7
5	Riva	Italy	9	14.1	10	15.6
6	Voest-Apline	Austria	37	4.7	36	5.2
7	Salzgitter	German	33	5.0	37	5.1
8	Lucchini	Italy	47	3.7	40	4.8
9	Technit	Italy	45	3.8	43	4.6
10	Rautaruukki	Finland	41	4.2	46	4.3
	Ispat ²	Netherlands	6	20.0	4	22.4

Notes: ¹Arbed and Usinor merged with Aceralia (Spain) in 2001 to form the world's largest steel producing company.

² ISPAT has its headquarters in the EU but it is a global company in a way that the others are not.

Source: International Iron and Steel Institute Reports

A number of these companies have been privatised over the last two decades as governments pursued de-regulation and neo-liberal policies. The pattern is indicated below:

Table 6: Privatisation of State Companies in the European Steel Industry

Year	Country	State Company	Privatised Company
1988	United Kingdom	British Steel Corporation	British Steel plc/Corus plc
1994	Italy	Ilva (former Italsider)	Riva
1995	France	Usinor-Sacilor	Usinor
1996	Austria	Voest-Alpine	Voest-Alpine
1996	Norway	A/S Norsk Jernverk	Rautaruukki (Finland)
1999	Belgium	Cockerill-Samba	Usinor

Source: Ranieri, R. and Gibellieri (1998) *The Steel Industry in the New Millennium*, Volume 2: Institutions, Privatisation and Social Dimensions, London: IOM Communications Ltd.

This chronology reflects the embrace of privatisation strategies across the EU, with the UK taking the lead in the 1980s and other EU countries following suit in the 1990s. In part, this reflects the way in which these types of policies are promoted centrally by the EU in the 1990s.

Overall, these developments are of relatively recent origin, following the deregulation and privatisation of the formerly state-owned steel industries (Ranieri and Gibelleri, 1998). One key aspect was the creation of steel enterprises as privatised companies, establishing themselves initially within national markets. Apart from the UK, most of these changes took place in the early 1990s, with UK steel industry privatised in the mid-1980s. Alongside this the privatised companies in Germany, for example, were de-regulated and the long-standing steel cartels broken up. The result was a nationally-based industry, in a prime position where there was an increasing concentration of ownership internationally, and where the focus of production was on an international market.

It is evident from the above that Europe is a key performer in the global steel industry. However, its place in the steel industry world-wide is made more complex when recent developments in the internationalisation of production are considered. Formerly the steel industry was heavily characterised by state intervention, including public ownership. To an extent this has remained the case even in the 1990s. However, the level of state ownership has diminished and Europe's steel producers are now more concentrated with a cross-border reach.

The importance of this period is that it provides the foundation for the subsequent mergers and acquisitions that occur towards the end of the 1990s. Certainly within the EU there has been much cross-border merger activity, so much so that just four groups now dominate steel production in Europe: Arcelor, Corus, Riva, and ThyssenKrupp. ISPAT International is also part of this constellation but as a genuinely international steel producer is not of the same order as the others, which are in the process of establishing themselves as internationally based companies (On ISPAT, see Report Two).

The sequence of merger and acquisition activity is presented below:

Table 7: Recent mergers and acquisitions in the European steel industry

Year	Original Companies	New Company	Principal Countries
1997	Arbed	Aquired 35% of Arcelaria	Spain Luxembourg
1998	Usinor	Acquired 75% of C. Sambre	France Belgium
1998	Thyssen and Krupp	Thyssen Krupp	Germany
1999	British Steel plc and Hoogovens	Corus	United Kingdom Netherlands
2001	Arcelaria Arbed Usinor	Arcelor	France Spain Luxembourg

Source: www.steelbb.com and related Industry Reports

Perhaps the most significant event in recent times as far European steel companies are concerned, is the merger of Arbed, Usinor and Acelaria to form Arcelor in 2001. Arbed and Usinor particularly, have always been major steel producing companies and the merger makes Arcelor the single largest steel producing company in the world. In terms of the internationalisation of steel, Arbed and Usinor were already heavily involved in this type of activity. Arbed had prior to the merger developed a position in Latin-America's steel industry, with the acquisition of shareholdings in Argentinian steelmaker Acindar and outright ownership of the Brazilian Monlevade works. Equally important was the development of a 'strategic agreement' between Usinor and the Japanese giant Nippon Steel.

Arcelor is now the world's biggest steel company with an annual output of 45 million mt. of crude steel. It has 15 integrated plants, and is the main consumer of iron ore in the world. The company also has 20 electric steel plants. These plants are located in: Belgium, France, Germany, Italy, Luxembourg, Spain and outside EU (i.e. Brazil, in which Arbed and Usinor control respectively the second largest producer of long products and the largest producer of stainless steel products).

The move to internationalise production is not confined to Arcelor. Corus have also looked to expand and internationalise their activities, with investments in the US, Canada and China (as both British Steel and Corus). In mid 2002, Corus attempted to acquire a major Brazilian company with extensive iron ore reserves as well as steel making capacity, although the proposed merger was subsequently abandoned for domestic reasons in each case (Steel Business Briefing, 31 July 2002). Major EU producers have also increasingly focused on Eastern Europe for investment, particularly with east and central Europe's integration into a broader Europe.

Thus, steel production in the EU is concentrated in few companies, and given the moves towards merger and acquisition, evident throughout the 1990s, and in view of the merger to form Arcelor, the process towards consolidation among steel producers is likely to continue. It is possible that these developments will involve a major non-European producer at some point in the near futures. It is in this way that steel producing companies are laying the foundation for the emergence of an internationalised form of steel production within the EU bloc.

Employment in the European Iron and Steel Industry

The Iron and Steel industry in the EU is a major employer of labour, as indicated in Table Eight.

Table 8: Iron and Steel Employment in EU countries, 1993 - 2000

Country	Year	1993	1994	1995	1996	1997	1998	1999	2000
Germany		126,404	105,158	94,634	86,648	82,956	80,564	78,720	77,264
Italy		51,044	45,547	42,935	40,869	35,955	38,455	38,472	38,112
France		41,661	40,877	39,301	38,564	38,053	38,468	37,879	37,913
UK		40,669	39,103	38,139	37,885	36,478	35,016	32,248	28,677
Spain		35,073	27,242	25,881	24,413	23,417	23,151	21,687	22,155
Belgium		25,486	24,527	23,657	23,371	20,849	21,021	20,213	19,737
Sweden		N/A	N/A	14,369	14,073	13,623	13,533	13,262	12,797
Austria		N/A	N/A	13,243	13,110	12,511	12,425	12,022	11,760
Netherlands		15,462	13,452	12,798	12,421	12,170	12,005	11,861	11,648
Finland		N/A	N/A	6,674	6,961	6,953	7,857	7,995	7,623
Luxembourg		7,304	6,741	6,236	5,603	4,941	4,252	4,059	4,071
Denmark		1,244	1,086	1,105	1,143	1,185	1,172	1,243	1,247
Greece		3,004	2,835	2,485	2,445	1,991	2,057	1,997	1,953
Portugal		3,248	3,070	2,768	2,551	2,176	1,997	1,757	1,556
Ireland		538	612	417	396	370	358	-	-

- Note:
1. Monthly figures = Number on books at the end of January for each year. This figure is a total of manual workers, non-manual workers and apprentices.
 2. The data are available in our new Steel databank only from 1993 onwards in a consistent way. For the countries (AUS, SW, FIN), the figures date from their entry into the EU.
 3. Ireland: Ireland did not send any data any further information for this questionnaire from 1999.

Source: Eurostat - Questionnaire 231, New Data Bank (Oracle)

The common feature of the iron and steel industry during the 1990s is that there has been an on-going decline in employment levels in the industry. Taking the 2000 figures as an indication of ranking, five countries have steel workforces in excess of 20,000: Germany, Italy, France, UK, and Spain (Eurostat, 2002). However, apart from France, the decline in workforce levels range between 19 per cent (Spain) and 36 per cent (United Kingdom). A number of EU countries do not have iron and steel production facilities of any note, and thus have very small iron and steel workforces: Luxembourg, Ireland, Denmark, Greece and Portugal. The other notable point is that the Netherlands is principally accounted for by one plant, the Corus complex at IJmuiden.

Employment Trends

The restructuring of the EU steel industry has coincided with large-scale cuts in its work force, as indicated in Table Nine.

Table 9: Employment in the EU steel industry, 1974 and 2000 ('000s)

Country	Employment, '000s		2000 as percentage of 1974
	1974	2000	
Austria	44	12	27
Belgium	64	20	31
Denmark	2	1	50
Finland	12	8	66
France	158	37	23
Germany	232	77	33
Greece	0	2	-
Ireland	1	0	-
Italy	96	39	40
Luxembourg	23	4	17
Netherlands	25	12	48
Portugal	4	2	50
Spain	89	22	24
Sweden	50	13	26
UK	194	29	14
Total	996	278	28

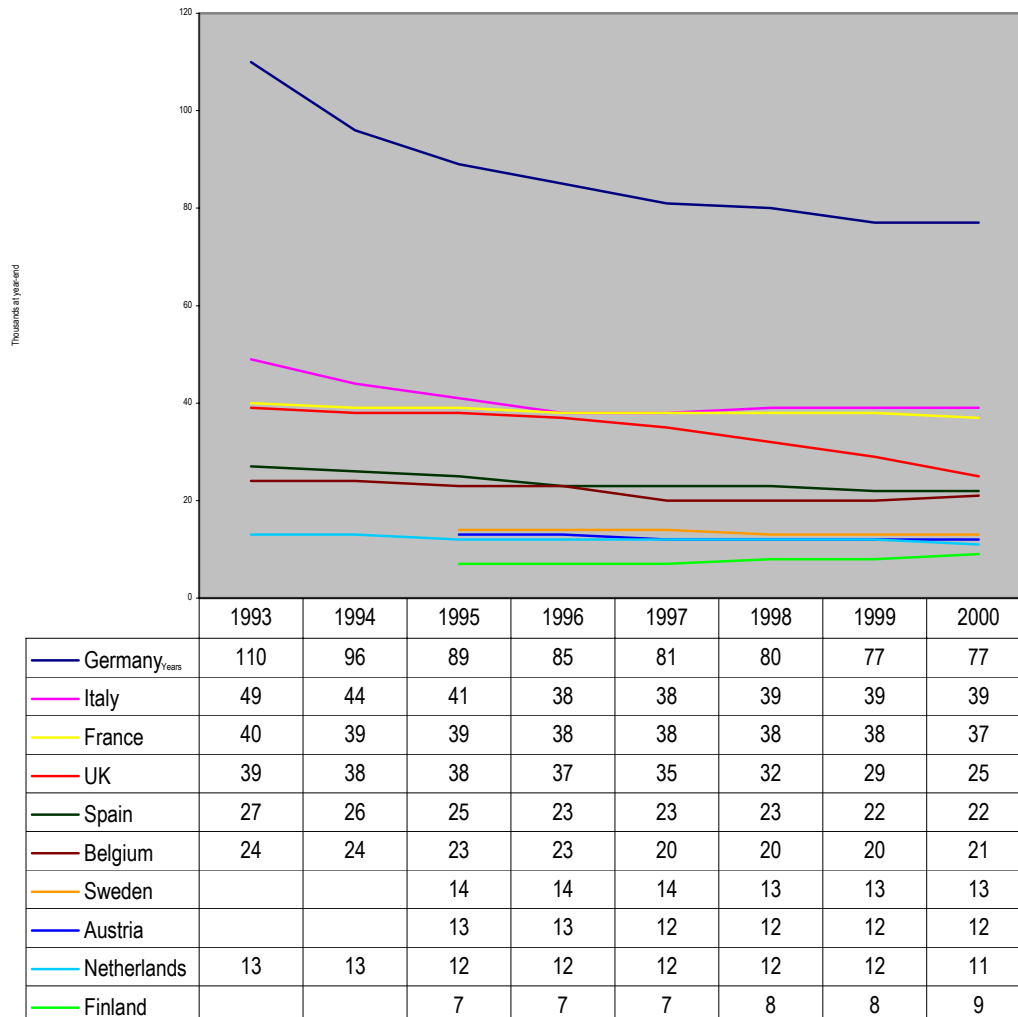
Note: Germany includes former GDR in 1999, but not in 1974.

Source: International Iron and Steel Institute, 2002.

The EU experienced particularly large cuts in its steel workforce between 1980 and 1990, with numbers dropping from 637,000 in 1980 to 386,000 in 1990, or by more than 39 per cent (ILO 1992). Similar reductions in employment in the steel industry have occurred world-wide; eastern Europe, the USA and Latin America have all experienced cuts in their workforces. The biggest single drop within the EU was in 1980 when the work force fell by 70,000 or 11 per cent. Overall, the number of people employed in the steel industry in the EU in 2000 was just 28 per cent of the figure for 1974. The most drastic cuts were experienced by the UK and France, where the number of jobs in steel have fallen from 197,000 to 29,000 and 158,000 to 37,000 respectively, over the period 1974 - 2000 (IISI 2000). In addition to this, in 2001 and 2003 the Anglo/Dutch steel producer Corus made wide-scale redundancies in the UK - at Shotton, Bryngwyn, Ebbw Vale, Llanwern, Redcar and Rotherham – with the loss of approximately 8000 jobs.

Over the last decade there has been a variable pattern in the employment trends in the ten major steel employers in the EU. These patterns are presented in Figure 4.

Figure 4: The Employment Trends of Ten Major EU Steel Employing Countries, 1993 – 2000
('000s)



Source: Eurostat - Questionnaire 231 and 234, New Data Bank (Oracle)

The decline in steel employment in Germany and the UK is particularly evident. While the major decline during the 1990s was in Germany, most other steel employers reduced their staff during this period. Significantly this was also a period where output increased sharply in these same countries. Of note is the observation that this reduction in staff is neither new nor has it ended.

These staff reductions have occurred within a context of rapidly increasing labour productivity. In part, this has been the outcome of labour reorganisation, with team working becoming relatively common in steel producing plants and the introduction of continuous innovation work procedures. It also is an outcome of extensive exploration of new technologies of production, with labour implications: the introduction of electric arc furnaces for mass steel production; merging of

continuous casting and rolling mill technologies into one casting process (thin-slab and strip casting); smelting reduction technologies; and the introduction of Near Net Shape technologies. The outcome is an industry that is undergoing change, although unevenly.

Technology

A relatively small number of companies have begun to introduce and use the new casting and rolling mill technologies, as indicated below.

Table 10: Thin Slab casting facilities in operation in the European Union, 2000

Country	Location	Company/ Company Base	Technology	Start-up	Capacity (Mt/y)
Sweden	Avesta	Avesta-Sheffield	VAI	1988	0.5 SS
Italy	Cremona	ISP Arvedi	SMS – DEMAG	1992/1	0.7
Italy	Terni	AST/Italy	SMS – DEMAG	1992/12	Speciality Steels
Spain	Bilbao	ACB	SMS – DEMAG	1996/10	0.9
Germany	Duisburg	Thyssen Krupp Stahl/Germany	SMS – DEMAG	1999/3	2.4
Netherlands	Ijmuiden	Corus (Hoogovens)/UK	SMS – DEMAG	1999/10	1.5
Italy	Sabolarie	ABS	DANIELI		Test Plant
East Europe					
Czech Rep.	Ostrawa	Nova Huta	VAI	1997	0.8 - 1.0

Source: Gibellieri, E. *The Future of Steel in Europe: A general overview of main trends, privatizations, mergers, technologies*, Presentation to Steel Conference, Cardiff University, April 2002

The strip facilities in Europe are also presented.

Table 11: Strip casting facilities in the European Union, 2000

Country	Location	Company	Type	Thickness (mm)	Weight (tons)	Speed (m/min)
France	Isbergues	Ugine	TwR	1.5 - 4	90	10/70
Germany	Krefeld	Thyssen Krupp Stahl-USINOR (now Arcelor)-VAI	TwR	No data	No data	No data
Germany	Unna	Thyssen Krupp Stahl	TdR	1.5 – 4.5	1	5-60
Italy	Terni	AST/CSM/VAI	TwR	2 - 5	60	50-80
Sweden	Luleå	MEFOS	SB	7 - 15	4	12-30
United Kingdom	Teesside	BS-Avesta	TwR	2.3 - 5.5	No data	20

| Notes: TwR=Twin Rolls; TdR=Two Rolls of unequal diameter; SB=Single Belt Roll

Source: Gibellieri, E. *The Future of Steel in Europe: A general overview of main trends, privatizations, mergers, technologies*, Presentation to Steel Conference, Cardiff University, April 2002

It can be expected as companies develop these technologies further and introduce them more widely throughout their plants, that the implications for labour are likely to be pronounced. In addition, it is likely that there will be further reorganisations of the steel labour process, with the development of high performance work systems and the like, as a complement to these technological developments.

The wider restructuring and merger activity of the European steel industry has been paralleled by a diversification of the activities of steel companies and a shift towards the production of higher value added steel products. These steel companies began to focus on their markets, or downstream activity. In the previous period, this was an industry that produced steel products in a fairly unfocused way. The consumers of steel products then undertook most of the preparation of the final product for its specific use, such as automobiles, domestic appliances, construction and so on. With the increased marketisation of the industry, the emphasis and production within plants began to change, with more attention being given to downstream activity.

These shifts in production focus mirror developments globally in the steel industry, particularly in countries such as Japan and the USA. Many companies in Europe now follow a “multiple business strategy” and participate actively in numerous new business areas outside steel production (ILO 1992). There is, moreover, a greater emphasis on a faster and more comprehensive service, higher quality produce, and higher levels of customer service. To facilitate this new responsiveness to customer demand, steel companies have increasingly looked to decentralise their operations and make the way production is organised more flexible. Such developments have impacted on the steel industry workforce in a number of different ways. Most evidently, this is in the way that work in the steel industry is organised, its levels of employment and the skills profile of the industry. As organisations look to become more flexible and responsive, steel producers adopt new working practices and technologies. A consequence of which is a much reduced but more highly skilled workforce.

Assessment

These developments should be located in relation to three features of the steel industry. First, this is an industry that is subject to cyclical trends, with consequences for company planning and strategy. In brief, steel companies face periodic cycles in production and demand, reflected in marked price fluctuations. During the 1990s, these fluctuations have been aggravated by pricing arrangements. As Sadler notes:

Roughly 75 per cent of world deliveries of steel are based on spot market prices rather than being based on long term contracts. These spot market prices have generally been unfavourable to steel producers since the mid 1990s, though to a varying extent. (Sadler, 2001, p. 53)

When these price fluctuations are considered in relation to the recent history of Sterling and Euro exchange rates, the difficulties facing EU steel producers are self-evident. A further complication has come with the recent announcements by the US administration to place three-year tariffs of 30% on eight of the 16 categories of imports of steel products. These include most flat products (except electrical sheet, but including tin mill products), and carbon bar. The tariffs on other products such as welded tube, stainless wire, bar and rod are in the range 8-15%. The tariffs are applied on top of any existing AD/CVD (Antidumping/Countervailing) duties, and are mostly well in excess of those "officially" recommended by the International Trade Commission. The implications for EU producers are likely to be marked and varied, depending on the production mix of companies.

Second, this is an industry that is suffering from seemingly chronic over-capacity. Currently, the global over-capacity is estimated at 250 mt, in relation to an output in the late 1990s of 750 to 800 mt (Sadler, 2001, p. 55). For European based companies the significance of this over-capacity is made more salient by the fact that the 100 mt of over capacity is accounted for by eastern Europe and the former Soviet Union, while 50 mt is accounted for by the EU, especially Italy and Spain. One implication of this feature is that the question of over-capacity is a problem not only for the UK but for other EU countries. Nonetheless, where governments have a stronger commitment to industry support and intervention than is evident in the UK, the social and political problems associated with restructuring are liable to be politically difficult to address. In these circumstances, the UK begins to look vulnerable alongside its EU counterparts.

Third, as already noted the industry is becoming increasingly internationalised with consequent implications for strategic decision making. Historically, many other industries, this has been an industry that has been characterised by limited cross-border co-operation between steel producers, and by few merger or take-over. From the mid 1990s this situation began to change, reflected in the establishment of Corus and the more recent creation of Arcelor, as well as other projected mergers and take-overs. In the context of over-capacity it is extremely likely that there will be further consolidation within the steel sector as producers position themselves in relation to changing market patterns, price volatility and fluctuation, and national consolidation. Most recently the US has begun to argue for an international agreement on steel over-capacity, along the lines secured in 1994 for the aluminium industry which had also suffered from over-capacity (Gow et al, 2001).

These changes have important implications for the organisation and control of labour in the steel works. One set of changes relate to technological innovation and change (Ranieri and Ayles, 1998). In the context of competitive markets - between companies and between countries - some companies began to explore alternative forms of production, such as the mini-mill, and alternative processes for casting and rolling within integrated steel plants, such as thin slab casting and strip casting (Ranieri and Ayles, 1998). However, these changes have been tentative and hesitant. More evident, has been an attempt to recompose steel workforces, so that a more malleable and compliant workforce is produced. One way in which this has occurred is via the reorganisation of steel workforces, with the introduction of various forms of team work and high performance work systems (Bacon and Blyton, 2000; Appelbaum *et al.*, 2000).

Against a backdrop of organisational and occupational restructuring, employers have looked to develop the skills profile of their work forces – not least in the steel industry. Certainly, the introduction of new knowledge intensive technology has demanded a more highly skilled

workforce, and a programme of restructuring towards flatter, more functionally flexible working practices has demanded workers with a higher degree of generic skills. Such developments have placed a high premium on education and training to develop the skills and competencies of workers. However, the contexts in which these developments take place raise distinctive sets of questions about the centrality of skill transformation and training in this industry.

The on-going restructuring of the steel industry within Europe raises critical questions about training and skill in the context of an increasingly inter-linked industry, both between steel plants in more than one country and between the steel industry and 'customers'. The first question is what is the implication for the organisation and operation of steelworkers of increasing internationalisation of steel production and consumption? With the increasing internationalisation of the industry, it is likely that there will be an emphasis on repositioning and reconstructing workforces so as to meet the challenges of these developments. Second, what is the impact of technological change and the extension of the production chain on steel work. With a changing production process, involving increased automation and experiments with new production processes, and the extension of steel producer activity into the downstream market, there appear to be pressures on workers to adapt and change to meet these new circumstances. It may be that there will be an increased emphasis on training so as to achieve a flexible and adaptable workforce. Third, what is the form of training offered? With the re-composition of the steel labour process there is likely to be pressure to ensure that steelworkers have the skills base to deal with the production related changes that are taking place. While training, both formally and informally, has been a feature of steelwork it may acquire a different significance in these changing circumstances. Fourth, are these developments leading to common patterns of development across the steel industry? It could be expected that as merger and acquisition become more common in the steel industry and the industry continues to consolidate within the European trade bloc, then similar approaches to skill development and training would occur. It may be that as with other industries there will be an increasing sharing and inter-change of practices between sites, especially in the same company.

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