

**COUNTRY REPORT**

**GERMANY**

**Prepared for**  
**European Nickel Group**

**29 January 2004**

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## 1. SUMMARY OF KEY FINDINGS

Germany is a major user of nickel. Total German use in 2002 was 165 kte (primary and recycled nickel units) which represented around 23% of EU demand. This demand is satisfied through a combination of imports of refined nickel and recycling of existing nickel.

Whilst the nickel industry itself is relatively small, it has a significant impact on the German economy through its value-chain. Through its critical use in nickel-containing alloys, it has a major impact on leading German industries such as stainless steel. In turn, the use of nickel-containing alloys in many important products manufactured in Germany means that the impact of nickel is substantial in many end-use markets.

As a consequence, the total value-added in Germany by nickel and its value-chain is estimated to be Euro 11 billion.

	<b>Value-added (Euro Million)</b>	<b>Employment</b>
Direct nickel industry/recycling	500	3,500
“First Use”	2,000	27,500
Intermediaries	1,000	24,000
“End Use”	7,000	130,000
<b>Total</b>	<b>11,000</b>	<b>185,000</b>

**Table 1: Value Chain Summary**

Companies in the “End Use” sector add most value to the nickel value chain (65%). The most important segments are gas turbines and process plant equipment for the food and drink industry (where German companies have a 35% share of the market), automotive diesel turbo chargers and High Precision Replication of CDs and DVDs (where German companies have a 30% market share).

Moreover, the direct nickel industry and the industries in its value chain that are critically dependent upon it, employ a substantial number of people. Total employment in Germany in the direct nickel industry, “First Use” industries and Intermediaries, and “End Use” industries that are critically dependent on nickel is estimated to be approximately 125,000. Some 60,000 additional jobs have been created in the economy through income and supplier “multiplier” effects and capital expenditure effects. Hence around 185,000 jobs are “critically dependent” on nickel.

The industry and its value-chain also contribute significantly to the German economy through high levels of investment. Total research and development by the direct nickel industry and industries critically dependent on nickel is estimated to be Euro



500 million. Annual capital expenditure by these sectors is estimated to be Euro 600 million and total capital employed is estimated to be Euro 10.5 billion.

The nickel industry and its value chain also account for substantial tax revenues. Total taxes (on employment and sales) paid by the direct nickel industry and industries critically dependent on nickel are estimated to be Euro 3.8 billion. This excludes corporate taxes.

## 2. INTRODUCTION

The value chain for nickel is complex. It involves three distinct tiers. These are the "Direct Nickel Industry", "First Use Sectors", and "End Use Applications".

The “**direct nickel industry**” comprises nickel mines, smelters and refineries. It also includes the transport and logistical activities associated with the movement of nickel within the EU and the activities associated with the importation of raw materials for refining (ore concentrates, nickel matte and nickel oxides) and refined nickel. The direct nickel industry also includes all activities associated with the recycling of nickel-containing products.

However, only a small amount of nickel is used as a product in its own right. Most often, it is usually combined with other materials to produce nickel-containing alloys (such as stainless steel) with distinct performance characteristics. Nickel is also used as a plating material, and to produce special chemical products for batteries and catalysts. These are known as “**First Use**” applications.

The nickel-containing alloys produced during the ““First Use”” stage are sold to product manufacturers both directly and indirectly. Those that are sold indirectly go via “**Intermediaries**”. These include distributors who serve smaller customers and fabricators, metal formers and surface engineering companies who undertake specialist services such as metal shaping, forming and sub-assembly.

Product manufacturers use the nickel-containing alloys as part of their manufacturing process. This group comprises a large number of manufacturers of components, sub-assemblies, and other products that are then used in the manufacture of further products. Collectively, they are known as “**End Use**” applications”.

This report summarises the key findings from the analysis we have undertaken of the nickel value chain in Germany. In particular, it quantifies key indicators of socio-economic impact, specifically: value-added, employment, capital expenditure, capital employed, R&D and taxes. For a detailed explanation of the methodology, please refer to the report on the European Union.



### 3 DIRECT INDUSTRY

- Over the last 20 years, the market for nickel in Germany has expanded substantially as many new uses of nickel have been developed. It is currently growing at over 3% per annum.
- Germany is the third largest nickel user in the world (after the USA and Japan) and total German use of nickel reached around 165 kte in 2002, representing around 23% of total EU use.
- Demand is satisfied in Germany through a combination of imports of refined nickel and recycling of existing nickel.
- Primary nickel is not produced in Germany. Substantial quantities of refined nickel are imported into Germany (110kte), mainly from outside the EU.
- The remainder of German demand is satisfied through the recycling of scrap (particularly stainless steel scrap) to produce re-usable nickel. The majority of this recycled nickel is derived from scrap collected from within Germany. Around 41kte (Nickel Units) of recycled nickel was collected in Germany in 2002. Recycled nickel comes from the recycling of end of life products and through the re-use of waste produced during the First Use manufacturing and fabrication process.
- The nickel industry produces around Euro 500 million in value-added in Germany, through recycling activities.
- Employment in nickel recycling activities in Germany was approximately 2,000 in 2002. This includes people employed directly in recycling activities and those employed in support activities such as importation and logistics.

In addition nickel-related activities created a further 1,500 jobs in the economy through income and supplier “multiplier” effects and capital expenditure effects. (Each Euro of expenditure on goods and services by companies and employees in the nickel industry generates additional employment in other sectors, especially services).

### 4. FIRST USE

- The primary uses of nickel are in the production of nickel containing alloys (stainless steel, alloy steels, non-ferrous alloys, and foundry products), nickel plating, and “other” products such as nickel cadmium batteries, chemicals, and catalysts<sup>1</sup>.

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<sup>1</sup> “Other” uses have been excluded from our analysis



- Over half of all nickel sales are concentrated in one sector – stainless steel, where nickel is a critical “enabling technology” that facilitates a number of important benefits for stainless steel producers. Among these are corrosion resistance, formability and “weldability”.
- Around 2.3 million tonnes of stainless steel and other alloys produced in Germany are *critically dependent on* nickel. These have a sales value in excess of Euro 3 billion.

- Thyssen Krupp, with its headquarters in Germany, is one of the leading global producers of stainless steel in Germany (with a capacity of 1.3 million tonnes), in Europe (2.3 million tonnes) and in the World (3.2 million tonnes). It has melting shops at Bochum and Krefeld. Hot-rolling is conducted at Bochum and cold-rolling is carried out at Krefeld.

Other important producers of stainless steel are BGH Edelstahl (at Frietal, Lippendorf and Siegen), Groditzer Stahlwerke (at Groditz), Schmidt & Clemens (at Lindlar) and Edelstahl Witten-Krefeld (at Krefeld and Witten)

- SMS-Demag is the world leader for the supply of stainless steel plant. Its headquarters are located in Dusseldorf, and it also operates from numerous sites in Germany. It supplies the full range of equipment for the manufacture of stainless steel; but its particular strengths are in the areas of melting shops and cold-rolling mills.
- Sundwig (part of the Austrian Andritz-Sundwig group) has its manufacturing facilities at Hemer. It concentrates on cold rolling mills and process lines.
- Automation and electrical components are important within stainless steel plants. SMS-Demag has its own automation group and Andritz-Sundwig is self-contained for automation equipment for rolling mills. However, Siemens is one of the leading specialist automation/electrical companies, supplying equipment to all manufacturers of stainless steel plant.
- Most companies have their own research facilities; and these are supported by specialist research institutes and universities such as:
  - Bundesanstalt für Materialforschung (BAM);
  - Verein Deutscher Eisenhüttenleute (VDEh); and
  - University of Karlsruhe.
- The second major use of nickel is in “non-ferrous” alloys. Germany is Europe’s largest producer (accounting for 50% of total European production). Important producers are Deutsche Nickel at Schwerte, Doncasters Precision



Castings at Bochum, Edelstahlwerke Buderhus at Wetzlar, KM Europa Metaal at Osnabruck, Schmidt and Clemens at Lindlar, Thyssen Krupp at Altena, Unna and Werdohl, Vacuumschmelze at Hanau, Saarstahl AG Volklingen (Saarland) and Wieland-Werke at Vohringen.

- There are around 650 jobbing companies involved in electroplating, most of whom offer a nickel plating service. Most of these companies are SMEs. In addition, there are about 1,600 manufacturing companies who have their own in-house plating plant, most of whom undertake nickel plating. They are located throughout Germany, but with particular concentrations in the regions of North Rhine Westphalia and Bavaria.
- The locations of the major German plants associated with the “First Use” industries as well as the direct nickel industry are included in the map in the Attachment.
- “First Use” industries that are critically dependent on nickel produce around Euro 2 billion in value-added at this stage in the value chain. Half of this comes from stainless steel.
- In addition, Intermediaries (e.g. fabricators) produce an additional Euro 1 billion in value-added.
- Employment in “First Use” industries and Intermediaries that are critically dependent on nickel is estimated at 32,000 people. This includes both the people employed directly by the “First Use” industries and those employed indirectly in activities that have now been outsourced to third party suppliers.

In addition, “First Use” industries created a further 17,500 jobs in the economy through income and supplier “multiplier” effects, and capital expenditure effects.

## 5. END USE

- Nickel-containing alloys are used in a wide range of products, but our analysis is confined to those that are critically dependent on nickel.
- There are a number of critical applications of nickel where the nickel-containing alloy significantly transforms either the production process or the end product being manufactured. Moreover, in a number of these applications, this transformation cannot be achieved in any other way or only through a substantial reduction in the performance of the product or the production process. These products are “critically dependent” on nickel. They include, for example:
  - **Turbo-chargers.** Nickel is used in the production of “ housings” and turbine wheels. Germany accounts for one-third of the European Union market. BorgWarner of the USA, one of two leading companies in this



sector has a plant at Kirchheimbolanden for manufacturing turbo-charger systems (which boost performance, improve consumption and reduce pollutant emissions). It also houses the main R&D facility for the division. Its customers include Ford, Daimler-Chrysler, General Motors and VW. Germany accounts for about one-third of the European Union market for turbo-chargers.

- **Jet engines.** All the parts exposed to extreme heat in the engines use nickel-containing super-alloys. Additionally, many of the steels used, for example, in shafts, incorporate nickel to cope with elevated temperatures and to minimise corrosion. Rolls Royce has factories at Dahlewitz and Oberursel in Germany in partnership with BMW. MTU Aeroengines, a subsidiary of Daimler-Chrysler, has a factory near Frankfurt. These account for more than 10% of the aerospace industry of the European Union.
- **Industrial and marine gas turbines.** Nickel-based super alloys are essential to the successful operation of the gas turbine. The major nickel users are Schmolz & Bickenbach, Platenthal and Thyssen Umformtechnik. The principal German producer of stationary and marine gas turbines is Siemens. Germany accounts for almost 40% of this sector.
- **Process plant equipment** manufacturers (in industries such as food and drink processing, oil and gas production, petroleum refining, chemicals and pharmaceuticals) are major users of nickel.
  - o The major usage of nickel is as an alloying element of stainless steel but, in special environments such as high temperature or corrosive environments, nickel-based alloys are applied instead of stainless steel. German companies account for more than 30% of this sector in the European Union.
  - o Leading German process plant equipment manufacturers include ABB Lurgi and Siemens.
- **Commercial catering equipment market.** The properties of stainless steel that are most valued by purchasers of commercial catering equipment include corrosion resistance, heat resistance and ease of cleaning. German suppliers account for 30% of this sector.
- **Medical and dental instruments market.** These include stainless steel products such as injection needles, pincers, drills and surgical instruments. They also include specialist hospital furniture. German companies such as Aesculap and Braun Melsungen account for 30% of the European Union market.





- **The CD/DVD pressing market.** Electroformed nickel is used in the production of “stampers”, which are used to manufacture of CDs and DVDs. Plated nickel is also used in the final stages of preparing the “glass master” from which the stampers are produced. There are 37 CD/DVD pressing plants in Germany. Recording companies with manufacturing facilities in Germany include BMG, Pallas, Time Warner and Universal. Germany accounts for 30% of the CD/DVD pressing sector in the European Union.

<b>End Use Segments</b>	<b>Sales Value Euro Million</b>
Automotive Diesel Turbo Chargers	500
Aerospace – Jet Engines	900
Gas Turbines	1,500
Process Plant	3,650
Commercial Catering Equipment	840
Medical and Dental Instruments	390
High Precision Replication – CD/DVD Pressing	780
Other	90
<b>Total</b>	<b>8,650</b>

**Table 2: Nickel critically dependent Segments - End Use**

- These “nickel dependent” markets account for around Euro 7 billion in value-added in Germany.
- These industries employ around 90,000 people. Additionally, they create a further 40,000 jobs in the economy through income, supplier “multiplier” and capital expenditure effects.



**ANNEXES**



### Summary of the Nickel Value Chain in Germany

	<b>Value Added</b>	<b>Jobs</b>	<b>Jobs Multiplier Effect</b>	<b>Total Jobs</b>	
	Euro M				
Direct Nickel Industry	450	2,100	850	2950	<b>Annex 1</b>
First Use	2,050	16,750	6,700	2,3450	<b>Annex 2</b>
Intermediaries	1,080	15,500	6,200	2,1700	<b>Annex 2</b>
Product Manufacturers	6,900	91,600	36,600	12,8200	<b>Annex 3</b>
<b>Total</b>	<b>10,480</b>	<b>125,950</b>	<b>50,350</b>	<b>17,6300</b>	

## **ANNEX 1**

### **DIRECT NICKEL INDUSTRY**



## Nickel: Direct Industry in Germany

### Annex 1

	(1) Sales Volume	(2) Sales Value	(3) Value Added	(4) Jobs	(5) Jobs Multiplier Effect	(6) Total Jobs	Basis of Sales Value	Basis of Added Value	Basis of Employment
	kte	Euro M	Euro M						
Mining	0.0	0	0	0	0	0	75% of LME = Eur 4750	All of sales value	See separate sheet (att 1.1)
Import of Raw Materials for Refining									
Ore concentrate	0.0	0	0	na			75% of LME = Eur 4750	No added value in Europe	No jobs created in Europe
Nickel matte and nickel oxides	0.0	0	0	na			85% of LME = Eur 5400	No added value in Europe	No jobs created in Europe
Importers Margin	0.0	0	0	0	0	0	1-2% of LME + say Eur100/te	Importers margin only	Sales per employee = Eur 200k
Smelting/Refining	0.0	0	0	0	0	0	LME = Eur 6,340/te	Sales value less mining & imports	See separate sheet (Att 1.1)
Trading and Importation									
Margin on Imports of Nickel	109.5	11	11	55	22	77	Importers Margin = 1-2% of LME	All of sales value	Sales per employee = Eur 200k
Paper trading/broking on LME	na	na	0	0	0	0			
Transport & Logistics									
Primary Nickel	109.5	11	11	110	44	153	1-2% of LME = Eur 100/te	All of sales value	Sales per employee = Eur100k
Recycled Nickel (Processors)	41.8	4	4	42	17	59	Eur 100/te for Processors+Imports	All of sales value	Sales per employee = Eur100k
Recycling (7)	55.7	546	429	1929	772	2,701	See separate sheet	See separate sheet	See separate sheet (Att 1.2)
<b>TOTAL</b>			<b>455</b>	<b>2135</b>	<b>854</b>	<b>2,989</b>			
	<i>Nickel Units</i>	<i>165</i>							

#### Notes

General: For the final report, all figures will be rounded

(1) Sales Volumes based on published data and NiDI "Nickel Flows analysis". Total EU sales = 121(refined output)+304 (imports) + 293 (Recycling) = 718

(2) Sales Value = Volume \*selling price (see separate column for individual assumptions)

(3) Value-added in Europe = Sales Value less sales value of previous stage in chain

(4) Jobs (Direct and Sub-Contractors) - mix of specific data (see separate sheets) and calculations based on average sales per employee data

(5) Jobs Multiplier effect - based on an average ratio of 0.4

(6) Jobs (Direct & Sub Contracted) + Multiplier Effect

(7) Recycling sales value = value of stainless steel scrap

## Mining and Refining in Germany

Annex 1.1.

Country	Company	Location	(1) Annual Production 2002 kte	(2) Direct Jobs	(3) Sub-Contracted Jobs	Total Jobs
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### *Mining*

No Mining in Germany

### *Smelting/Refining*

No Refining in Germany

#### Notes

- (1) Annual production based on published data (World Nickel Statistics April 2003)
- (2) Direct Job estimates based on published sources
- (3) Sub contracted jobs: Study estimates

## Recycling in Germany

Annex 1.2.

	(1) Sales Volume (Ni units)  kte	(2) Sales Volume Ni based St Steel Scrap	(3) Sell-Out Price Achieved  Euro/te	(4) Sales Value  Euro M	(5) Value Added  Euro M	(6) Labour Costs  Euro/te	(7) Total Labour Costs  Euro M	(8) Labour Cost per person  Euro K	(9) Jobs
Collectors	11.9	132	704	93	93	170	22	25	899
Dismantlers	5.5	61	704	43	43	135	8	25	330
Fabricators & Service Centres Scrap	9.4	104	704	74	74	30	3	30	104
[Middlemen]	26.8	298	774	230	21	5	1	35	43
Imported Scrap	15.0	167	704	117	na	na			0
[Scrap Processors]	41.8	464	882	410	62	30	14	35	398
Mill Home Scrap	13.9	154	882	136	136	30	5	30	154
<b>Total EU</b>	<b>55.7</b>	<b>619</b>		<b>546</b>	<b>429</b>		<b>54</b>		<b>1929</b>

### Notes

- (1) Based on NiDI "Nickel Flows" analysis and study estimates  
(2) Assumes nickel content of 9%  
(3) Estimates based on BHP Billiton study  
(4) Sales Volume of nickel based Stainless steel scrap \* sell-out price achieved (Column 2 \* Col 3)  
(5) Sales value less previous stage in the value chain  
(6) Labour cost per tonne = study estimate  
(7) Sales Volume of nickel based Stainless steel scrap \* labour cost per tonne (Col 2 \* Col 6)  
(8) Labour cost per person = study estimate based on EU Average Production Worker rates  
(9) Total labour costs / labour cost per person (Col 7 / Col 8)

## **ANNEX 2**

### **FIRST USE & INTERMEDIARIES**



## "First Use" in Germany

Annex 2

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	Notes
	<i>Nickel</i>	<i>Cost of</i>	<i>Average</i>	<i>Total</i>	<i>Average</i>	<i>Value of</i>	<i>Value</i>	<i>Value</i>	<i>Direct Jobs</i>	<i>Contracted out</i>	<i>Jobs</i>	<i>Total</i>	
	<i>Units</i>	<i>Nickel</i>	<i>Nickel</i>	<i>of Metal</i>	<i>Price</i>	<i>Ni-based</i>	<i>of</i>	<i>Added</i>	<i>Dependent</i>	<i>Jobs dependent</i>	<i>Multiplier</i>	<i>Dependent</i>	
	<i>kte</i>	<i>Input</i>	<i>Content</i>	<i>Based on Ni</i>	<i>to users</i>	<i>Sales</i>	<i>Imports</i>	<i>Eur M</i>	<i>on Nickel</i>	<i>on Nickel</i>	<i>Effect</i>	<i>on Nickel</i>	
		<i>Eur M</i>	<i>%</i>	<i>kte</i>	<i>Eur/te</i>	<i>Eur M</i>	<i>Eur M</i>	<i>Eur M</i>					
Stainless Steel	85.0	539	10.5	810	2,000	1,619	81	999	5397	1619	2806	9822	(13)
Alloy Steels	18.2	115	1.5	1,213	600	728	36	576	2427	728	1262	4417	(14)
Non-ferrous Alloys													
Nickel Based	40.6	257	50.0	81	5000	406	41	108	1353	406	704	2463	(15)
Copper Based	5.5	35	15.0	37	3000	110	17	59	367	110	191	667	
Foundry	6.4	41	5.0	128	1000	128	10	77	427	128	222	777	(16)
Plating	4.2	27	na	na	na	282	28	227	3300	495	1518	5313	(17)
[Other]	5.5	na	na	na	na	na	na	na	na	na		na	(18)
<b>TOTAL</b>	<b>165.4</b>	<b>1014</b>		<b>2269</b>		<b>3273</b>	<b>213</b>	<b>2046</b>	<b>13270</b>	<b>3486</b>	<b>6702</b>	<b>23459</b>	
[Intermediaries]	na	na	na	na	na	na	na	1080	13500	2025	6210	21735	(19)
<b>GRAND TOTAL</b>	<b>165.4</b>	<b>1014</b>		<b>2269</b>		<b>3273</b>	<b>213</b>	<b>3126</b>	<b>26770</b>	<b>5511</b>	<b>12912</b>	<b>45194</b>	

### Notes

General - all data will be rounded in final report

(1) As per published data

(2) Volume x LME (Euro 6340)

(3) NiDI broad estimates

(4) Nickel units/nickel content x 100

(5) NiDI broad estimate

(6) Total volume based on nickel x average sell out price of metal to its users

(7) Estimated value of other (non-nickel) imports e.g. chrome

(8) Value of nickel based sales less cost of nickel input less cost of other imported inputs

(9) Value of nickel based sales/sales per employee

(10) Assumes ratio of direct to indirect jobs of 0.5 (BSSA estimate)

(11) Assumes overall average multiplier of 0.4

(12) Direct jobs + contracted out jobs+ Multiplier effect

(13) Total Volume of Stainless Steel = published figure. Sales per employee based on review of major Stainless companies

(14) Estimated Sales per employee

(15) Estimated Sales per employee

(16) Estimated Sales per employee

(17) Plating - see separate sheet

(18) Other = not part of Phase One review

(19) Intermediates - see separate sheet

## Stainless Steel and Alloy Intermediaries in Germany: Summary

Annex 2.1.1.

	<b>Direct Jobs</b>	<b>Value-Added (Eur M)</b>
<b>Stainless Steel</b>		
Distributors	6429	579
Fabricators	3500	252
Metal Formers	1800	81
Surface Engineering	756	76
<b><i>Sub-total</i></b>	<b><i>12485</i></b>	<b><i>988</i></b>
<b>Alloy Steels</b>		
Distributors	1033	93
<b><i>Sub-total</i></b>	<b><i>1033</i></b>	<b><i>93</i></b>
<b>Non-Ferrous Alloys</b>	0	0
<b><i>Sub-total</i></b>	<b><i>0</i></b>	<b><i>0</i></b>
<b>Total</b>	<b>13518</b>	<b>1081</b>

## Intermediaries in Germany - Distributors

	(3)	(4)	(5)	(6)	(7)	(8)	(9)	Annex 2.1.1. (10)	
	Indirect Sales (kte)	Purchase Cost (Euro te)	Purchase Cost (Euro M)	Gross Margin (% sales)	Sell-out Price (Euro te)	Sales Value (Euro M)	Value Added (Euro M)	Employment Sales per man (Euro '000)	Employment Direct Jobs
Stainless Steel	675	2000	1350	30	2857	1929	579	300	6429
Alloy Steels	310	700	217	30	1000	310	93	300	1033
Non-Ferrous Alloys	0	N/A	0	N/A	N/A	0	0	300	0
<b>TOTAL</b>	<b>985</b>		<b>1567</b>		<b>3857</b>	<b>2239</b>	<b>672</b>		<b>7462</b>
<i>Indirect Sales (1)</i>	<i>Consumption</i>	<i>Indirect Sales</i>	<i>Indirect Sales</i>						
	(kte) (2)	(%)	(kte)						
<u>Stainless Steel</u>									
France	477	60	286						
Germany	1350	50	675						
Italy	1376	50	688						
Spain	431	60	259						
UK	289	75	217						
Other Europe	900	80	720						
<b>Total</b>	<b>4823</b>	<b>60</b>	<b>2845</b>						
<u>Alloy Steels</u>									
France	360	25	90						
Germany	1240	25	310						
Italy	613	25	153						
Spain	40	25	10						
UK	100	25	25						
Other Europe	177	25	44						
<b>Total EU</b>	<b>2530</b>	<b>25</b>	<b>633</b>						
<u>Non-Ferrous Alloys</u>									
EU		0	0						

### Notes

General - all data will be rounded in the final report

Valuation - Stainless steel distributors serve smaller customers, providing product availability, break of bulk and inventory services. They are specialist businesses - C. 85-90% of sales are stainless steel. Although not all stainless steel includes nickel, the specialist nature of these businesses and their dependency on stainless steel means that the overall economics of the business depends on nickel. The valuation is based on a whole-business approach. Similar arguments apply to distributors of alloy steels

(1) Figures for indirect sales by country and for each main metals sector are BSSA broad estimates

(2) INCO data and NiDI estimate

(3) NiDI broad estimates

(4) Indirect sales x purchase cost per te (col 2 x col 3)

(5) BSSA broad estimate

(6) Based on estimated gross margin (raw material cost is purchase cost of metal - distributors take ownership) and purchase cost

(7) Indirect sales x sales price per te (col 2 x col 6)

(8) Sales value minus metal cos. Metal costs are sell-out prices from stainless steel and alloy producers. Value added by these sales has been accounted for elsewhere in the value chain.

(9) Study estimate based on discussions with BSSA and assessment of activities, gross margin and relative importance of different key inputs (labour, capital, ideas)

(10) Sales divided by revenues per man (col 7 / col 9)

## Intermediaries in Germany - Fabricators, Metal Formers & Surface Engineering companies (1)

Annex 2.2.

	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>Intermediary Type</b>	<b>Market Size</b>	<b>Market Size</b>	<b>Purchase</b>	<b>Gross</b>	<b>Engineering</b>	<b>Sell-out Price</b>	<b>Sales Value</b>	<b>Value Added</b>	<b>Sales</b>	<b>Employment</b>
	<i>(% SSteel Consumption)</i>	<i>(kte)</i>	<i>Cost (Euro M)</i>	<i>Margin (%)</i>	<i>Charge (% metal cost)</i>	<i>(Euro te)</i>	<i>(Euro M)</i>	<i>(Euro M)</i>	<i>per employee (Euro '000)</i>	<i>Direct Jobs</i>
Fabricators	10	135	378	40	N/A	4667	630	252	180	3500
Metal Formers	5	68	189	30	N/A	4000	270	81	150	1800
Surface Engineering (2)	10	135	0	N/A	20	N/A	76	76	100	756
<b>Total</b>	<b>25</b>	<b>338</b>	<b>2026</b>				<b>976</b>	<b>409</b>		<b>6056</b>

### Stainless Steel Consumption (kte)

France	477
Germany	1350
Italy	1376
Spain	431
UK	289
Other Europe	900
<b>Total</b>	<b>4823</b>
<i>Purchase cost from distributors (Euro/te)</i>	<i>2800</i>

#### Notes

General - all data will be rounded in the final report

Valuation - all employment and value-added is based on an income-stream basis because these types of business tend to be multi-material and stainless steel is not the dominant part of their business. It is assumed that non-nickel based stainless steel use in these sectors is not material

(1) These sectors are assumed to be limited to stainless steel only

(2) These business do not take ownership of the metal. They charge for a service, including material costs. Charges are based on a % of metal value

(3) BSSA broad estimate

(4) EU stainless steel consumption x % penetration

(5) All materials are supplied from distributors. Purchase costs equals market size (kte) x distributor sell out price (Euro 2,800)

(6) BSSA broad estimate

(7) BSSA broad estimate

(8) Based on gross margin (%) and purchase cost

(9) Market size (kte) x sell out price for Fabricators and Metal Formers (col 3 x col 7). Engineering charge rate x distributor supply price x market size (kte) for Surface Engineering

(10) Sales value less purchase cost of metal (col 8 - col 4)

(11) Study estimate based on discussions with BSSA, activities performed, margins, and relative importance of key inputs (labour, capital, and ideas)

(12) Sales value divided by sales per employee

## Nickel Use in the Plating Sector in Germany

Annex 2.2.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>Plating Sectors</b>	<i>Nickel Units (kte)</i>	<i>Cost of Nickel Input (Euro M)</i>	<i>Plating Charge (% of nickel input cost)</i>	<i>Nickel Plating Revenues (Euro M)</i>	<i>Non-EU Costs (Eur M)</i>	<i>Value Added (Eur M)</i>	<i>Sales per employee Euro '000s</i>	<i>Employment Direct Jobs</i>
Engineering	0.8	5	5	102	10	86	85	1195
Decorative	3.4	22	12	180	18	140	85	2117
<b>TOTAL</b>	<b>4.2</b>	<b>27</b>		<b>282</b>	<b>28</b>	<b>227</b>		<b>3312</b>
<i>Nickel Price (Euro te)</i>	6,350							

### Notes

General - all data will be rounded in the final report

Plating sector - NiDI estimate that there are c. 6,000 independent plating companies in the EU (4,000 'formal' - members of trade associations; and 2,000 'informal'). Of these businesses only 1,500 carry out some form of nickel plating: 750 'formal' and 750 'informal'. Nickel plating is carried out by independents and in-house plating shops. 80% of nickel plating shops are independents and 20% in-house. If this is taken into account then there are c. 1,875 nickel plating shops in the EU - 1,500 independent, and 375 in-house.

Valuation basis - for plating shops that carry out nickel plating it represents 30-50% of sales. We have valued only the nickel-based revenues and jobs linked to them i.e. an income stream approach rather than a whole-business approach

(1) NiDI estimate of sector consumption x use by sector

(2) Nickel price per te x consumption of nickel

(3) Plating companies do not take ownership of metal parts: they charge for a service, including costs of raw materials consumed. NiDI broad estimate of relationship between costs of nickel and final plating charge. These are point estimates derived from ranges: engineering 2-10%; and decorative 10-15%

(4) Grossed up from cost of nickel as % of total revenues

(5) Study estimate of costs from non-nickel costs from suppliers outside the EU. Estimate is 10% of revenues

(6) Sales revenues less nickel cost and non-EU costs

(7) Study estimate based on relative use of critical resources (capital, labour, ideas) to add value within typical plating shops

(8) Plating revenues divided by sales per person i.e. an income stream approach rather than a whole-business valuation

### **ANNEX 3**

#### **PRODUCT MANUFACTURERS**

## Product Manufacturers in Germany that are Nickel Dependent

Annex 3

	(1) Total End-User Sales Value  Euro M	(2) Sales Per Employee  Euro K	(3) Direct Employment in Product Manufacturers	(4) Contracted out Jobs	(5) Employment Multiplier Effect	(6) Total Employment
<i>Nickel Dependent Segments</i>						
Automotive Diesel Turbo Chargers	500	120	4167	2083	2500	8750
Aerospace - Jet Engines	900	220	4091	2045	2455	8591
Gas Turbines	1500	220	6818	3409	4091	14318
Process Plant in Food and Drink Industry	2850	100	28500	8550	14820	51870
Process Plant in Oil and Gas Production	100	150	667	200	347	1213
Process Plant in Petroleum Refining	120	150	800	240	416	1456
Process Plant in Chemicals	345	150	2300	690	1196	4186
Process Plant in Pharmaceuticals	220	100	2200	660	1144	4004
Commercial Catering Equipment *	840	85	9882	2965	5139	17986
Beer Kegs	45	100	450	135	234	819
Medical & Dental Instruments and Hospital Equipment	390	200	1950	585	1014	3549
High Precision replication - CD & DVD pressing	780	130	6000	1800	3120	10920
High precision replication - textile & wallpaper printing	20	150	133	40	69	243
Computer Modems (Service/distributors)	25	150	167	50	87	303
<b>TOTAL</b>	<b>8635</b>		<b>68125</b>	<b>23453</b>	<b>36631</b>	<b>128208</b>

### Value-Added Analysis

Total End User Market Value	8635
less Ni Stainless Steel/alloy value & other imported raw materials	1727
equals Value-added by Product Manufacturers	6908

#### Notes

General - All numbers will be rounded for final report

(1) Derived from wide variety of sources (see separate sheet)

(2) Based on review of relevant company accounts plus study estimates

(3) Total End User market value / sales per employee

(4) Study Estimate

(5) Assumed to be 0.4 average income and supplier multiplier

(6) Direct employment + Contracted out activities + Multiplier effect

**ANNEX 4**

**MAP OF GERMANY**





