



Stainless Steel in Figures **2015**

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Secretary-General's Message

Dear Members

This is the fourth edition of Stainless Steel in Figures, which has proved to be a popular 'ready reference' for our members.

We have broadened the scope of the information which is provided this year. For the first we introduce statistical data from the raw material associations who are members of the Team Stainless network. We hope that this will provide a more useful information source for our readers.



We record our appreciation to our partners in the Team Stainless network for their willingness and help in providing data. An analysis of the statistical data for stainless steel can be significantly improved by a parallel analysis of the data for the essential raw materials which give steel its stainless properties. We are therefore very grateful to the International Chrome Development Association (ICDA), the International Nickel Study Group (INSG) and the International Molybdenum Association (IMOA) who have kindly agreed that there is relevance for this innovative joint work for the benefit of their own members as well as the members of ISSF. Stainless steel is a significant market for the producers of chromium (96% for metallurgical grade), nickel (65% of production) and molybdenum.

The information which has been provided about the raw materials is strictly confidential and is for the use of ISSF members and the members of the contributing associations only. That information should please not be re-published without the express permission of the associations.

The stainless steel data belongs to the ISSF and our members are welcome to use it as they wish.

If any of you have any comments or suggestions on how this booklet may be improved for future editions, please let me know.

John Rowe

Secretary-General,
International Stainless Steel Forum (ISSF)

Brussels, May 2015



Section 1: History and Competition

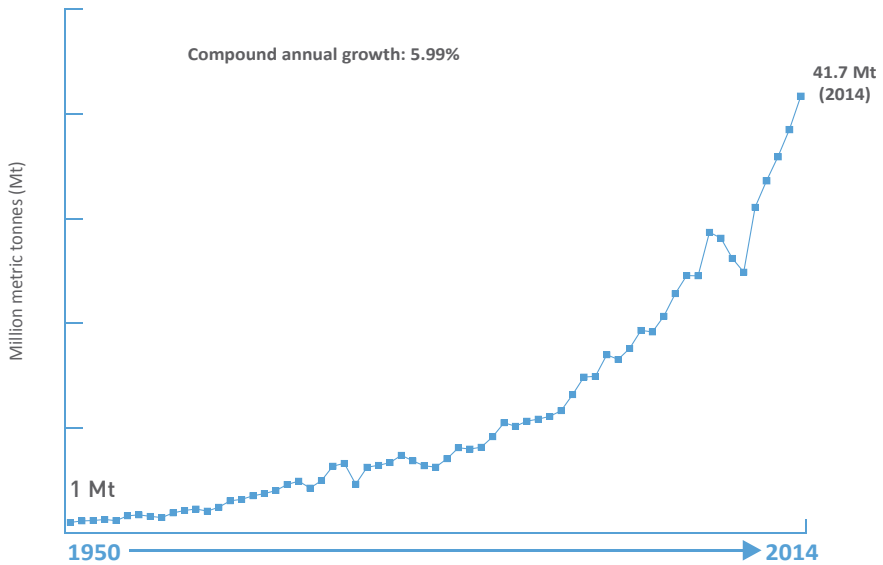


Figure 1: Compound annual growth rate of world stainless melt shop production (slab/ingot equivalent): 1950 – 2014 (in Mt)

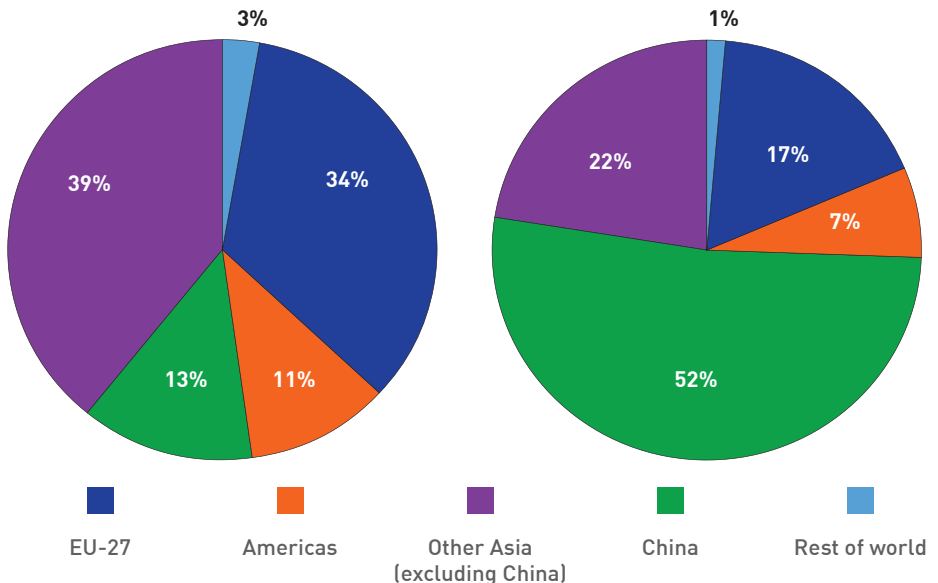


Figure 2: Regional share of stainless steel production: 2005 (left) and 2014 (right)

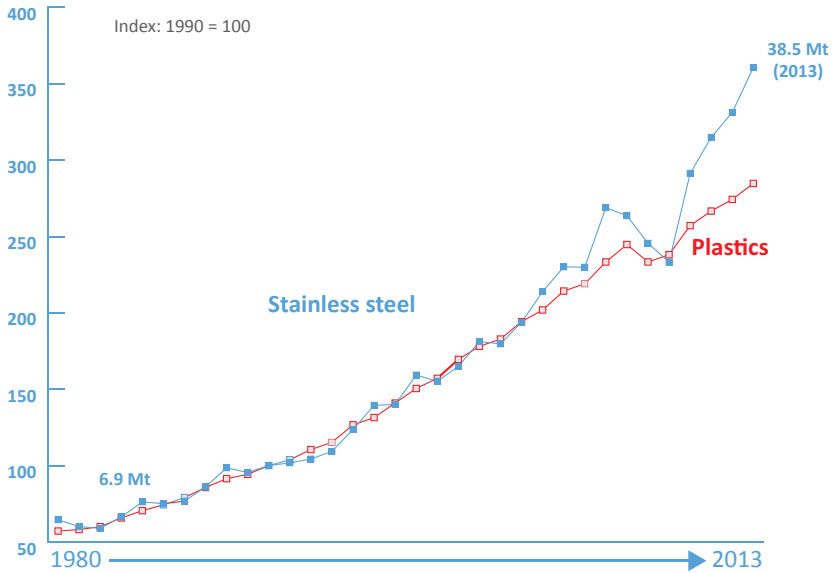


Figure 3: *Stainless steel production versus plastics production: 1980 – 2013. The production evolution of both is similar, though stainless steel is more volatile.*

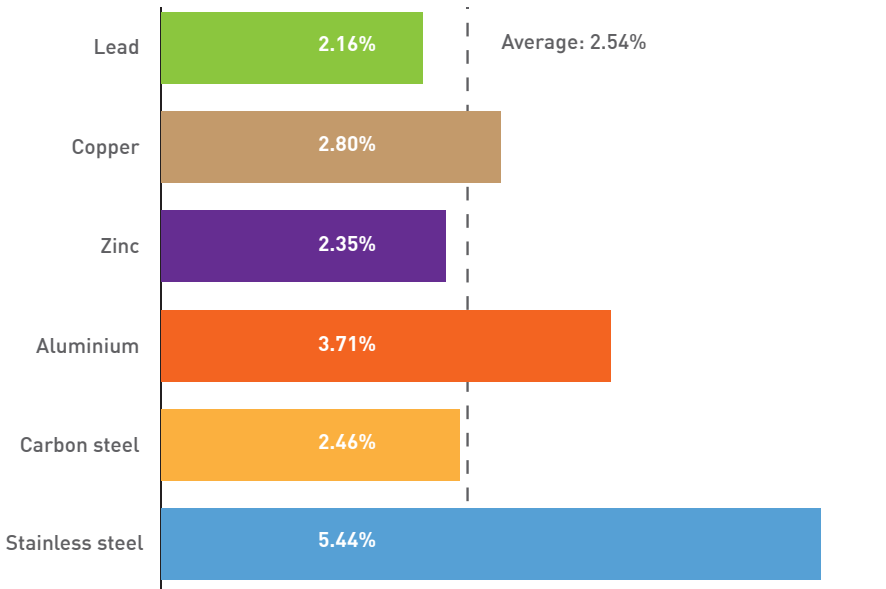


Figure 4: *Compound annual growth rate of major metals (%/year): 1980 - 2014*



Section 2: Actual Performance

Country/Region	2008	2009	2010	2011	2012	2013	2014
Belgium	1,471	1,045	1,306	1,241	1,241	1,298	1,388
Finland	957	726	998	1,003	1,078	1,080	1,216
France	297	202	276	300	285	300	323
Germany	1,574	1,320	1,509	1,502	1,313	1,091	864
Italy	1,471	1,216	1,583	1,602	1,696	1,556	1,457
Spain	998	693	844	807	844	855	945
Sweden	574	445	546	586	510	501	541
United Kingdom	340	224	279	330	294	257	295
Other EU	158	114	152	188	195	211	223
European Union	7,838	5,986	7,494	7,559	7,455	7,147	7,252
USA	1,925	1,617	2,201	2,074	1,977	2,030	2,389
Brazil	390	324	409	413	391	425	424
Americas	2,315	1,942	2,609	2,486	2,368	2,454	2,813
Japan	3,567	2,607	3,427	3,247	3,166	3,175	3,328
South Korea	1,660	1,677	2,048	2,157	2,167	2,143	2,038
Taiwan, China	1,297	1,468	1,514	1,203	1,107	1,067	1,108
China	6,943	8,805	11,256	14,091	16,087	18,984	21,692
India	1,832	1,721	2,022	2,163	2,834	2,891	2,858
Asia	15,299	16,277	20,267	22,861	25,361	28,260	31,025
South Africa	528	546	480	443	503	492	472
Russia	135	86	122	125	112	152	123
Ukraine	104	67	118	147	118	n/a	n/a
World	26,218	24,904	31,090	33,621	35,917	38,130	41,686

Table 1: Stainless melt shop production (ingot/slab equivalent) in 1,000 metric tonnes: 2008 – 2014.

Note: A major correction of Chinese data in 2011 means data from 2011 onwards is not comparable with earlier years.



		Western Europe/ Africa	Central & Eastern Europe	The Americas	Asia (excluding China)	China	World
Quarter 1	2013	2,157	67	598	2,298	4,575	9,696
	2014	2,164	71	670	2,371	5,084	10,359
	% change	0.3	5.5	11.9	3.2	11.1	6.8
Quarter 2	2013	1,951	84	596	2,253	4,584	9,468
	2014	2,116	72	717	2,387	5,603	10,894
	% change	8.5	-14.2	20.1	5.9	22.2	15.1
First half	2013	4,108	151	1,195	4,551	9,159	19,164
	2014	4,280	143	1,386	4,757	10,687	21,253
	% change	4.2	-5.4	16.0	4.5	16.7	10.9
Quarter 3	2013	1,576	64	629	2,284	5,016	9,569
	2014	1,682	70	711	2,374	5,336	10,173
	% change	6.8	9.4	12.9	3.9	6.4	6.3
Quarter 4	2013	1,813	80	630	2,441	4,809	9,773
	2014	1,608	64	716	2,202	5,670	10,259
	% change	-11.3	-20.6	13.7	-9.8	17.9	5.0
Second half	2013	3,388	145	1,260	4,725	9,825	19,342
	2014	3,290	134	1,427	4,576	11,005	20,432
	% change	-2.9	-7.3	13.3	-3.2	12.0	5.6
Full year	2013	7,496	296	2,454	9,279	18,984	38,506
	2014	7,570	277	2,813	9,333	21,692	41,686
	% change	1.0	-6.3	14.6	0.6	14.3	8.3

Table 2: Stainless melt shop production (slab/ingot equivalent) by quarter in 1,000 metric tonnes: 2013 compared to 2014



Section 2: Actual Performance

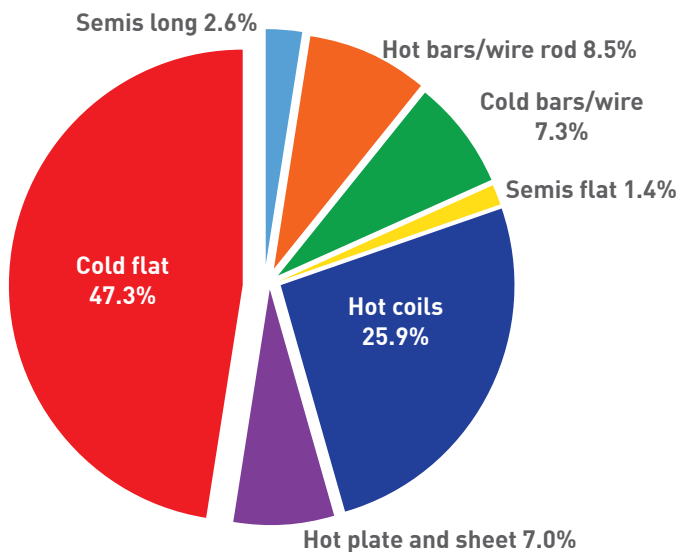


Figure 5a: Stainless steel foreign trade in 2013

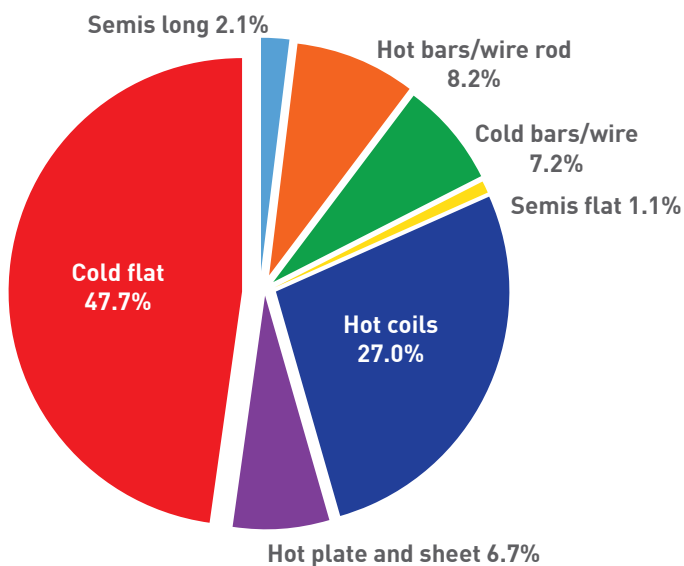


Figure 5b: Stainless steel foreign trade in 2014



	Destination								
	Africa	Asia	Eastern Europe	Latin America	Middle East	NAFTA	Australia /Oceania	Western Europe	Total
Africa	10.6	98.3	13.1	42.7	17.3	26.5	1.1	86.0	295.7
Asia	85.5	4,683.3	117.1	156.9	187.6	331.1	75.7	1,242.9	6,880.2
Eastern Europe	0.0	1.2	24.0	0.0	0.0	3.6	0.0	25.3	54.2
Latin America	1.7	13.7	0.1	48.9	1.4	12.9	0.1	8.9	87.8
Middle East*	0.0	3.5	0.0	0.0	n/a	3.6	0.4	2.3	9.8
NAFTA	1.0	66.4	0.1	61.5	2.9	489.2	1.1	142.6	764.7
Australia/Oceania	0.0	1.1	0.0	0.0	0.0	0.4	0.6	0.0	2.1
Western Europe	75.2	496.2	122.6	67.3	59.5	612.4	26.6	6107.1	7,566.8
Total	174.0	5,363.8	277.0	377.4	268.7	1,479.7	105.5	7,615.2	15,661.3

Table 3a: Foreign trade exports of stainless steel in 2013 (1,000 metric tonnes). Includes feedstock material for further processing.

	Destination								
	Africa	Asia	Eastern Europe	Latin America	Middle East	NAFTA	Australia /Oceania	Western Europe	Total
Africa	14.0	94.8	16.6	48.6	11.9	35.9	1.6	90.1	313.4
Asia	93.3	5,356.7	147.4	176.6	199.4	495.7	75.7	1,637.3	8,182.0
Eastern Europe	0.0	4.7	28.6	0.0	0.0	4.3	0.0	14.0	51.6
Latin America	2.6	11.8	0.3	34.9	3.0	13.7	0.1	6.5	72.8
Middle East*	0.0	4.7	0.0	0.0	n/a	3.6	0.4	1.4	10.1
NAFTA	0.5	59.2	0.1	48.1	1.9	663.5	0.8	147.9	922.2
Australia/Oceania	0.1	1.3	0.0	0.0	0.0	0.5	1.0	0.2	3.1
Western Europe	65.8	505.6	97.6	59.1	70.2	487.9	19.7	6,680.0	7,985.9
Total	176.3	6,038.7	290.6	367.3	286.4	1,705.2	99.3	8,577.3	17,541.1

Table 3b: Foreign trade exports of stainless steel in 2014 (1,000 metric tonnes). Includes feedstock material for further processing.

Note: *Indicates imports from that region.



Section 2: Actual Performance

	Destination								Total
	Africa	Asia	Eastern Europe	Latin America	Middle East	NAFTA	Australia /Oceania	Western Europe	
Africa	0.1	20.9	0.0	0.0	0.1	0.0	0.0	5.0	26.0
Asia	0.2	552.8	0.0	0.0	0.2	0.2	0.0	24.3	577.8
Eastern Europe	0.0	5.3	0.5	1.6	0.1	0.0	0.0	59.1	66.5
Latin America	0.0	7.2	0.0	0.0	0.0	0.2	0.0	41.0	48.5
Middle East*	0.0	75.5	0.0	0.0	n/a	0.0	0.0	14.3	89.8
NAFTA	0.5	628.4	0.1	1.8	0.7	192.9	0.0	47.3	871.6
Australia/Oceania	0.0	39.3	0.0	0.0	0.0	0.0	0.1	1.7	41.1
Western Europe	1.0	376.8	1.1	0.0	1.3	0.9	0.0	2,656.7	3,037.8
Total	1.8	1,706.1	1.7	3.4	2.3	194.3	0.2	2,849.4	4,759.1

Table 4a: Foreign trade exports of stainless steel scrap in 2013 (1,000 metric tonnes).

	Destination								Total
	Africa	Asia	Eastern Europe	Latin America	Middle East	NAFTA	Australia /Oceania	Western Europe	
Africa	0.0	29.6	0.0	0.0	0.9	0.0	0.2	2.8	33.4
Asia	0.0	561.2	0.0	0.1	0.2	1.9	0.0	21.6	585.0
Eastern Europe	0.0	4.8	3.3	2.3	0.0	0.0	0.0	109.2	119.6
Latin America	0.0	18.5	0.0	0.0	0.0	14.8	0.0	33.3	66.6
Middle East*	0.0	96.3	0.0	0.0	n/a	0.5	0.0	16.5	113.3
NAFTA	0.1	573.9	0.0	1.4	1.1	278.7	0.0	24.1	879.3
Australia/Oceania	0.0	50.9	0.0	0.0	0.5	0.2	0.4	1.1	53.0
Western Europe	0.1	382.4	2.9	0.0	1.3	32.4	0.1	3,080.1	3,499.4
Total	0.3	1,717.6	6.2	3.8	3.8	328.5	0.8	3,288.6	5,349.7

Table 4b: Foreign trade exports of stainless steel scrap in 2014 (1,000 metric tonnes).

Note: *Indicates imports from that region.

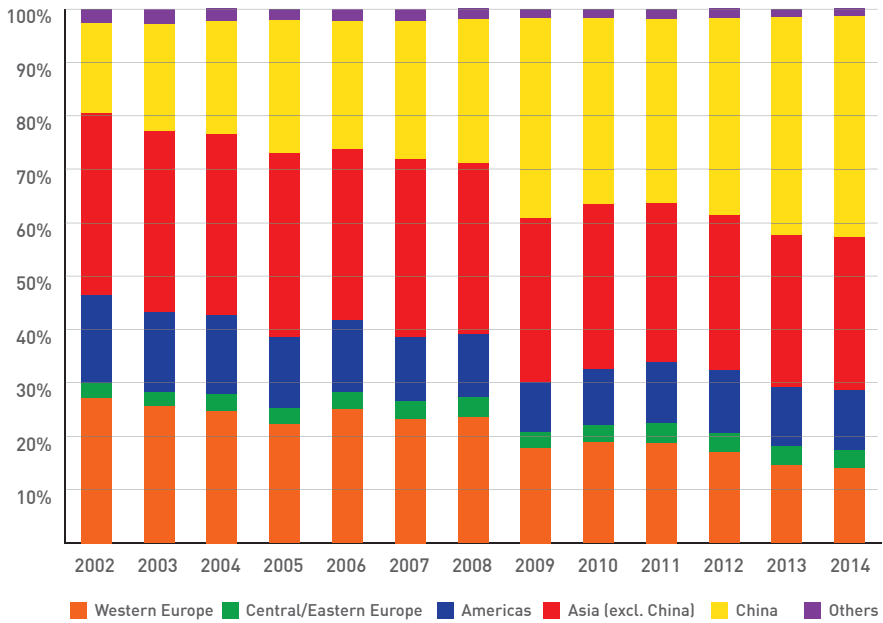


Figure 6: Apparent stainless steel use by region: 2002 - 2014

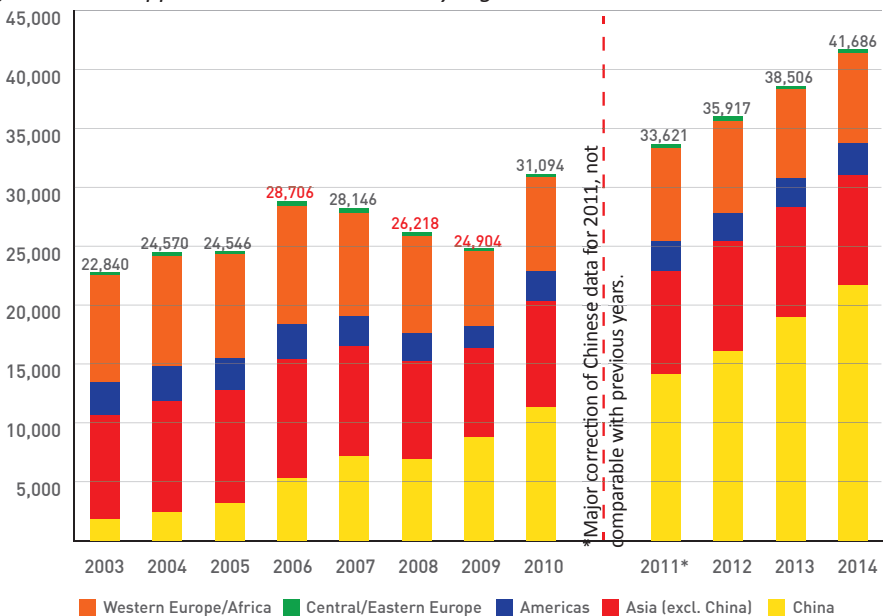


Figure 7: Stainless melt shop production (slab/ingot equivalent) by region: 2003-2014 (in 1,000 metric tonnes)



Section 2: Actual Performance

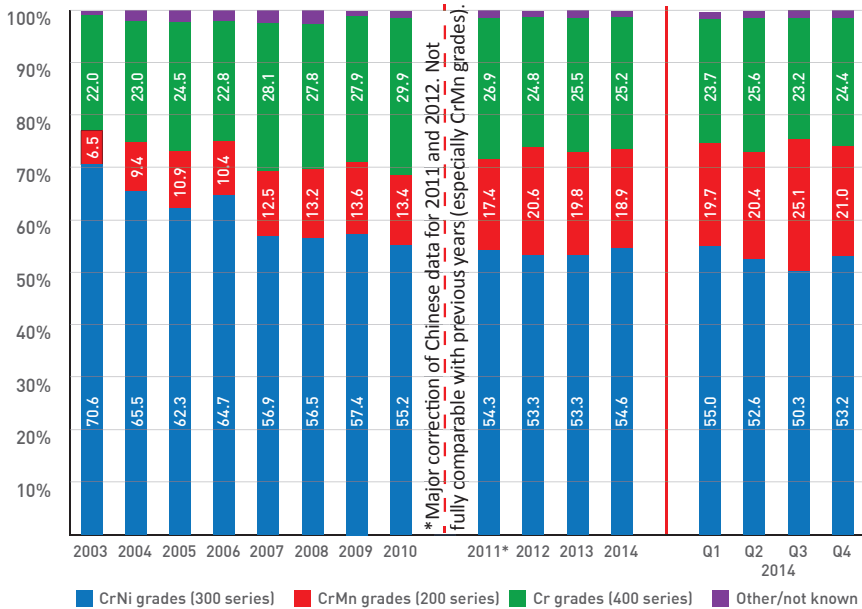


Figure 8: Stainless melt shop production (slab/ingot equivalent) by grade: 2003-2014

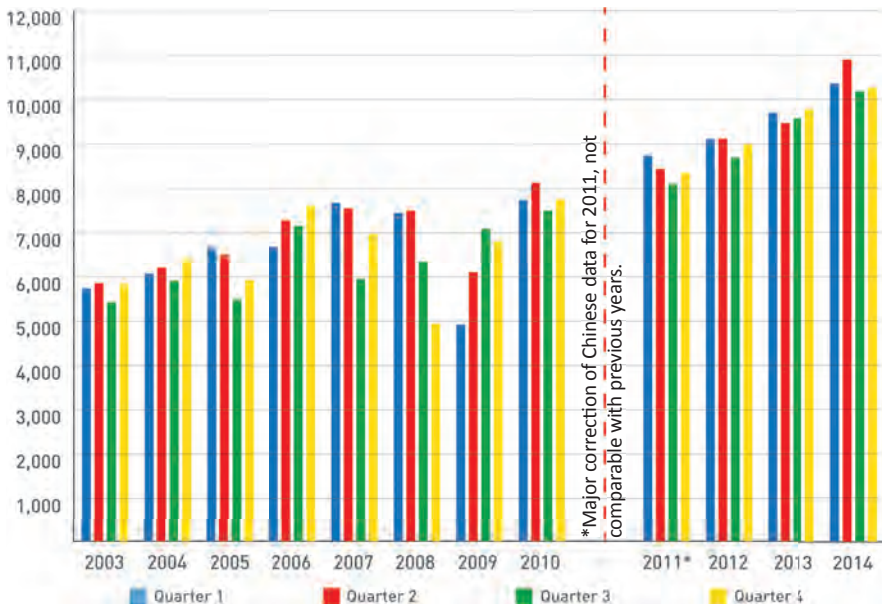


Figure 9: Stainless melt shop production (slab/ingot equivalent) by quarter: 2003-2014 (in 1,000 metric tonnes)



Section 3: Potential

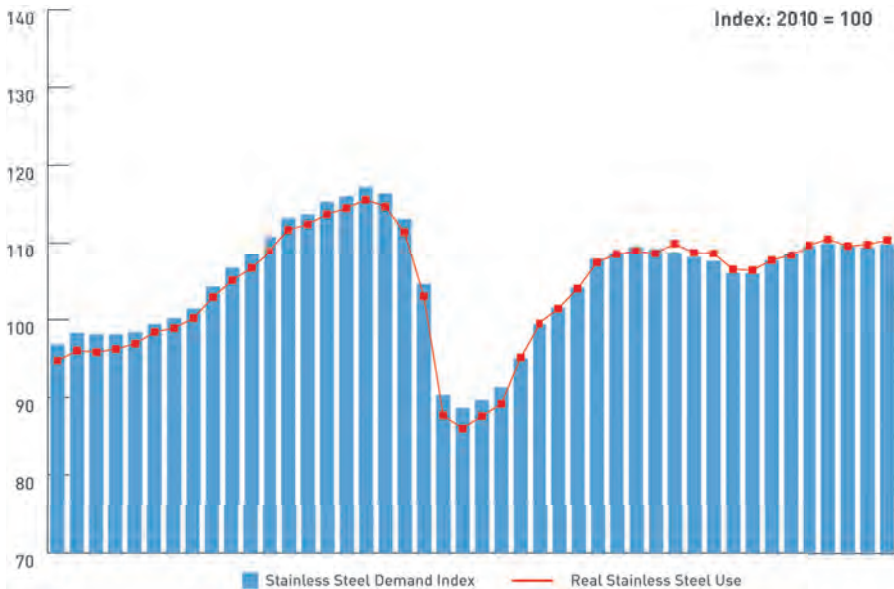


Figure 10: *Stainless steel demand versus real stainless steel use - Europe (Q1 2004 to Q4 2014p)*

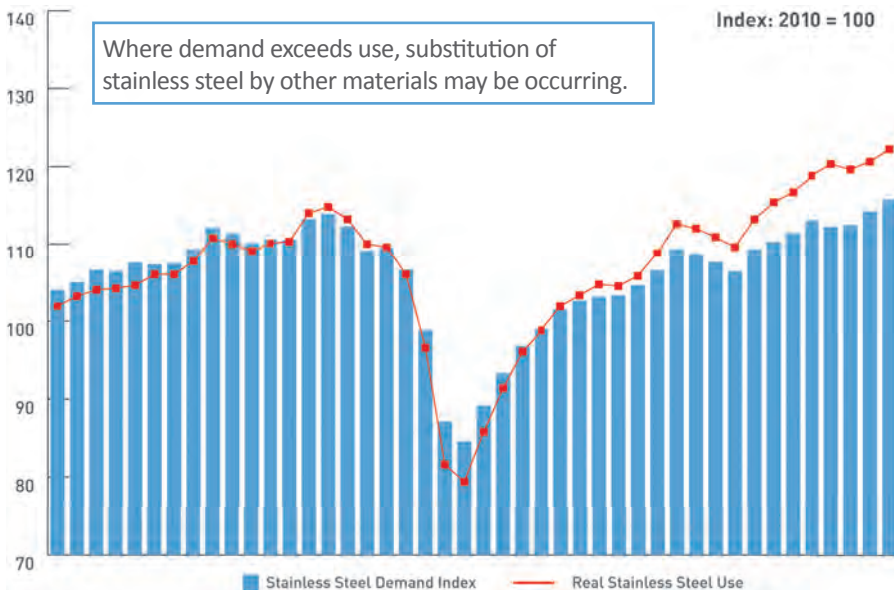


Figure 11: *Stainless steel demand versus real stainless steel use - The Americas (Q1 2004 to Q4 2014p)*



Section 3: Potential

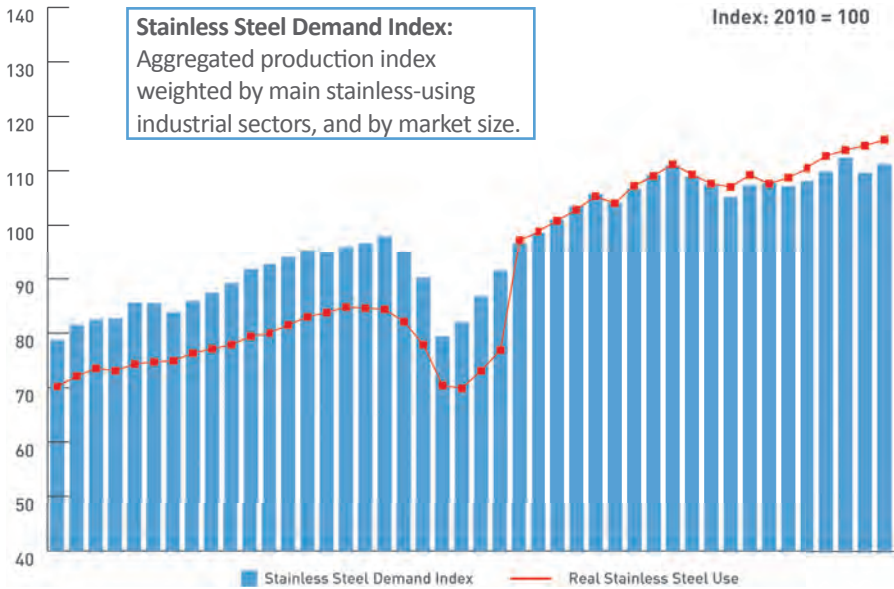


Figure 12: Stainless steel demand versus real stainless steel use - Asia, excluding China (Q1 2004 to Q4 2014p)

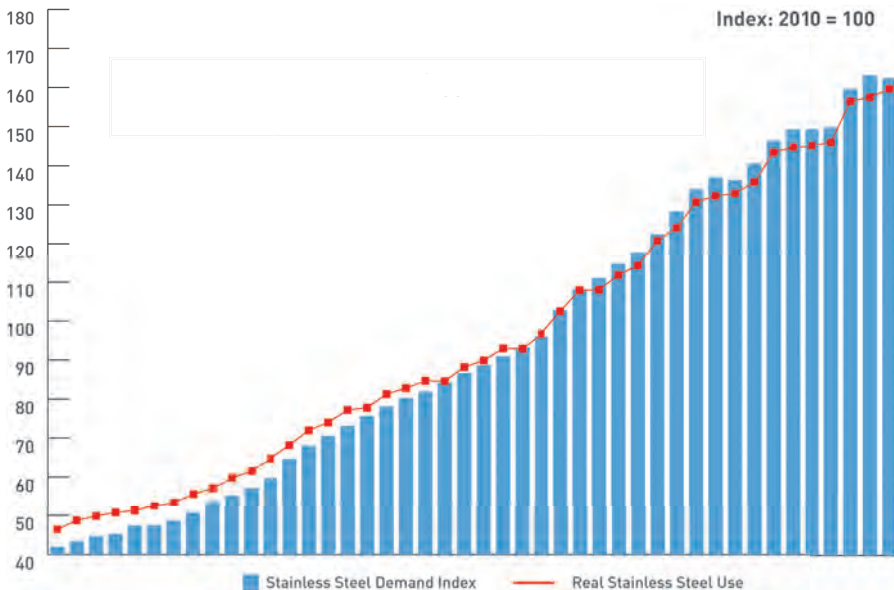


Figure 13: Stainless steel demand versus real stainless steel use - China (Q1 2004 to Q4 2014p)

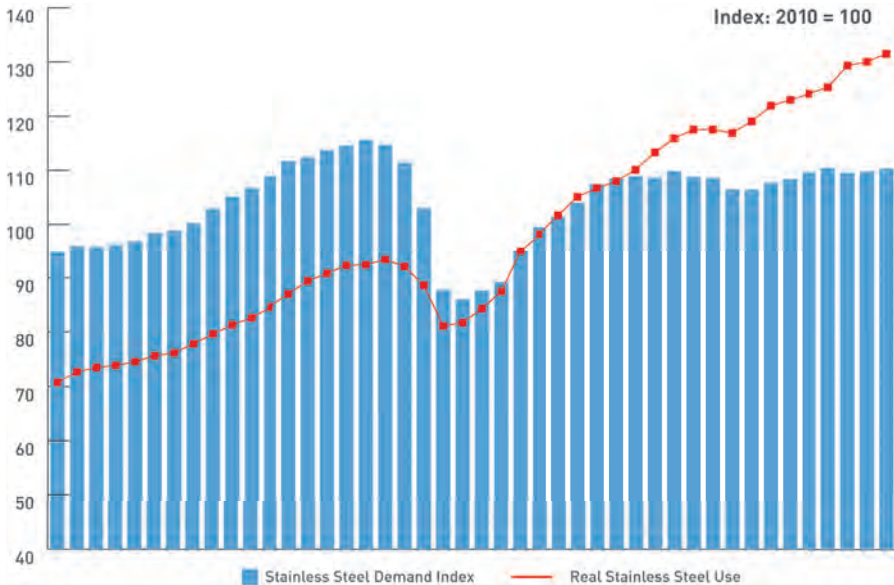


Figure 14: Stainless steel demand versus real stainless steel use - World (Q1 2004 to Q4 2014p)

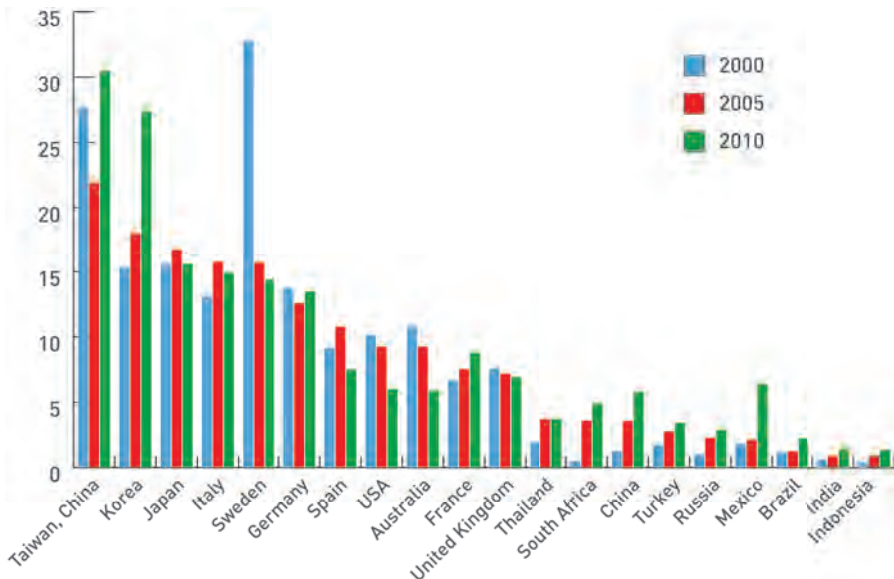


Figure 15: Comparison of per-capita direct and indirect use of stainless steel - selected countries - 2000, 2005 and 2010 (kg/capita). Source: IMF, Yale.

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Section 3: Potential

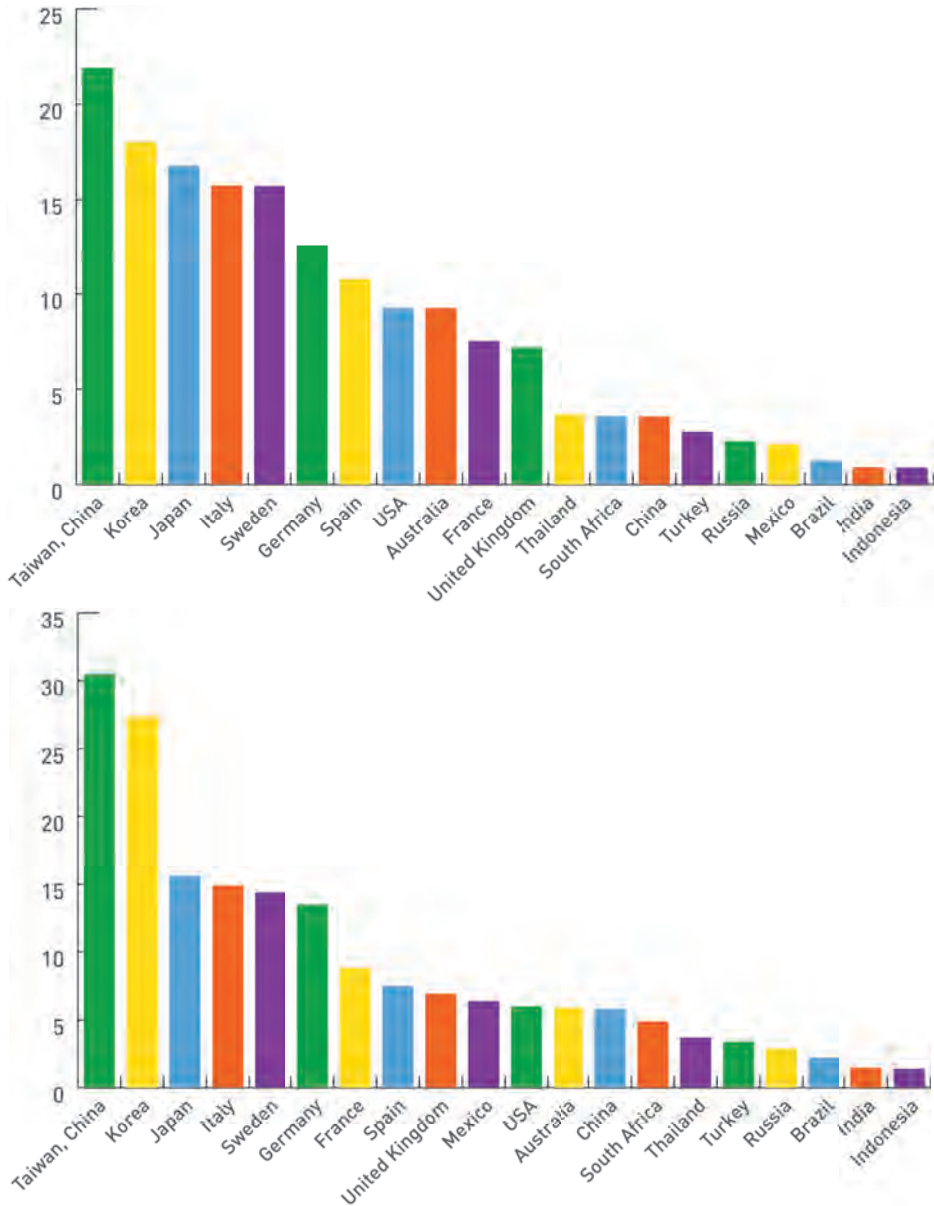


Figure 16: Per-capita direct and indirect use of stainless steel (kg/capita) for selected countries - 2005 (top) and 2010 (bottom). Source: IMF, Yale.

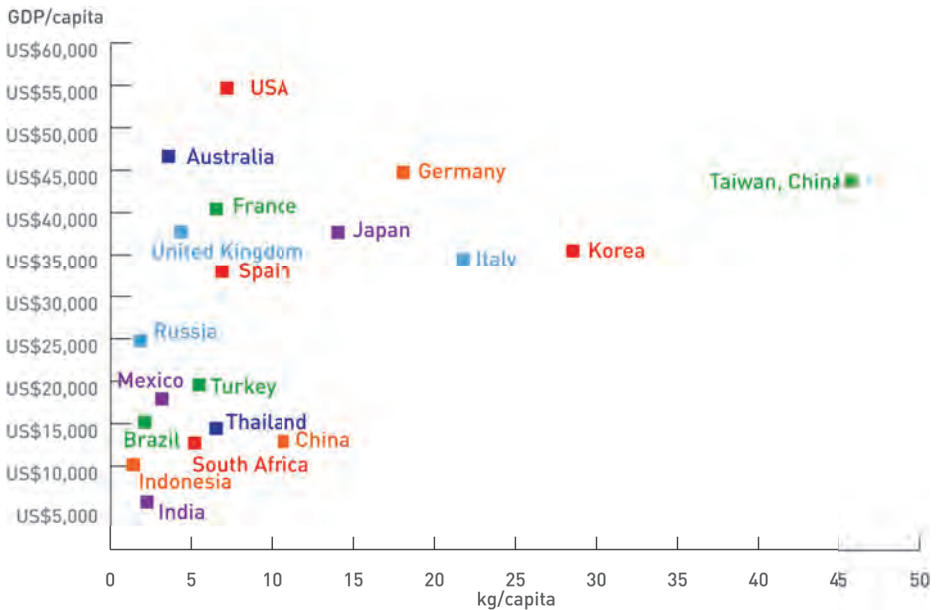
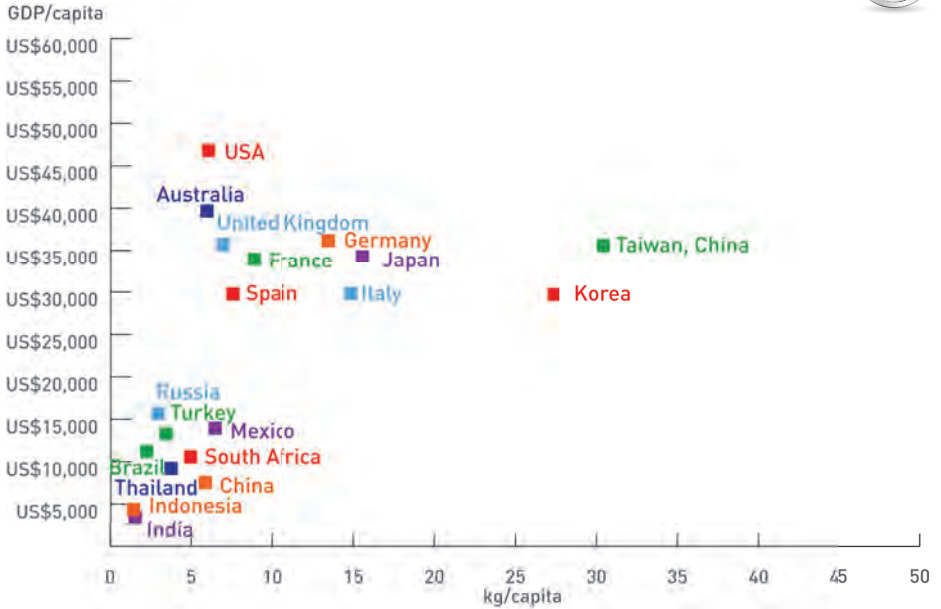


Figure 17: GDP PPP per capita versus stainless steel use per capita in 2010 (top) and 2014 (bottom). Source: IMF, ISSF, Yale.

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Section 3: Potential

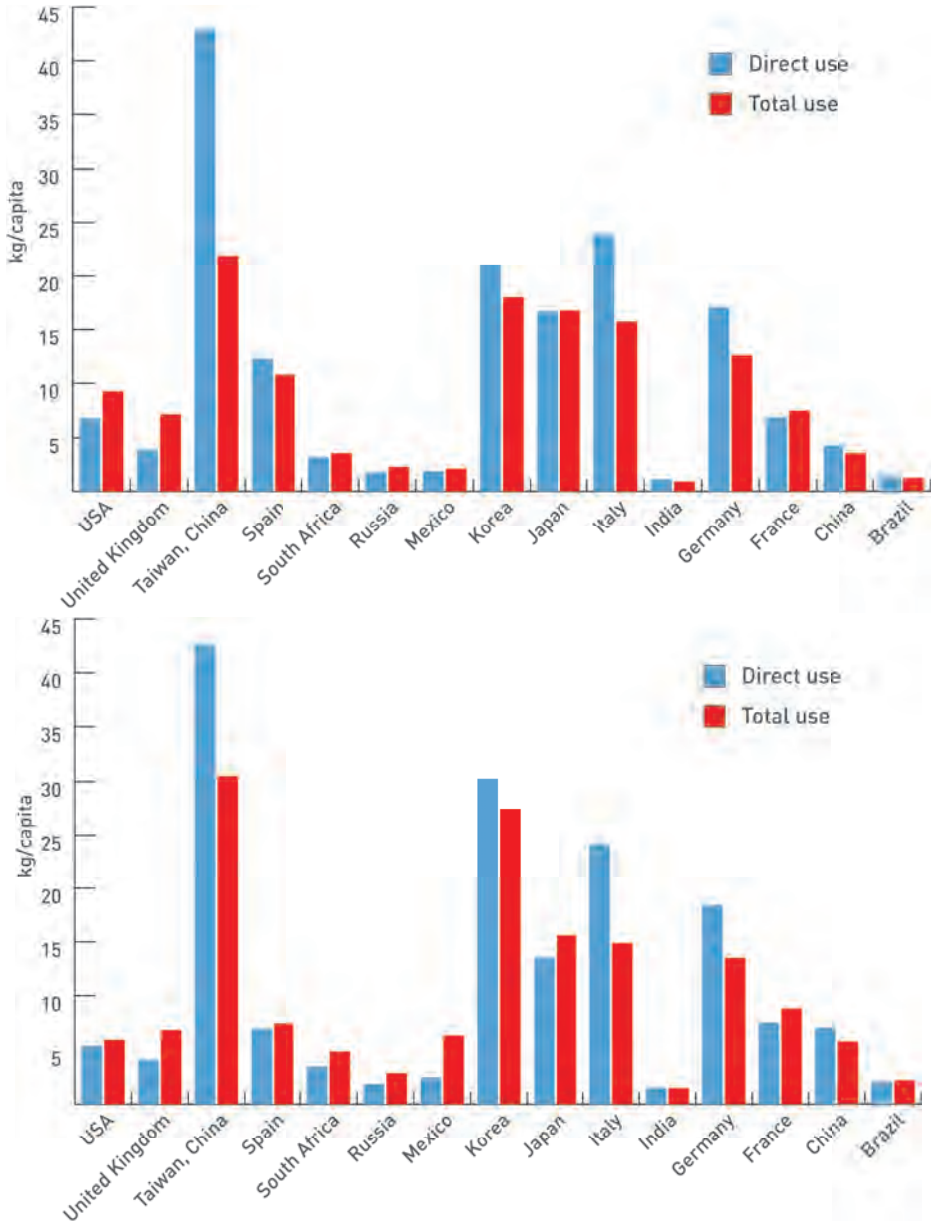


Figure 18: Comparison of direct stainless steel use (mill products) versus total stainless steel use (plus trade balance of stainless containing goods) in 2005 (top) and 2010 (bottom). Source: IMF, Yale, Vale Inco.

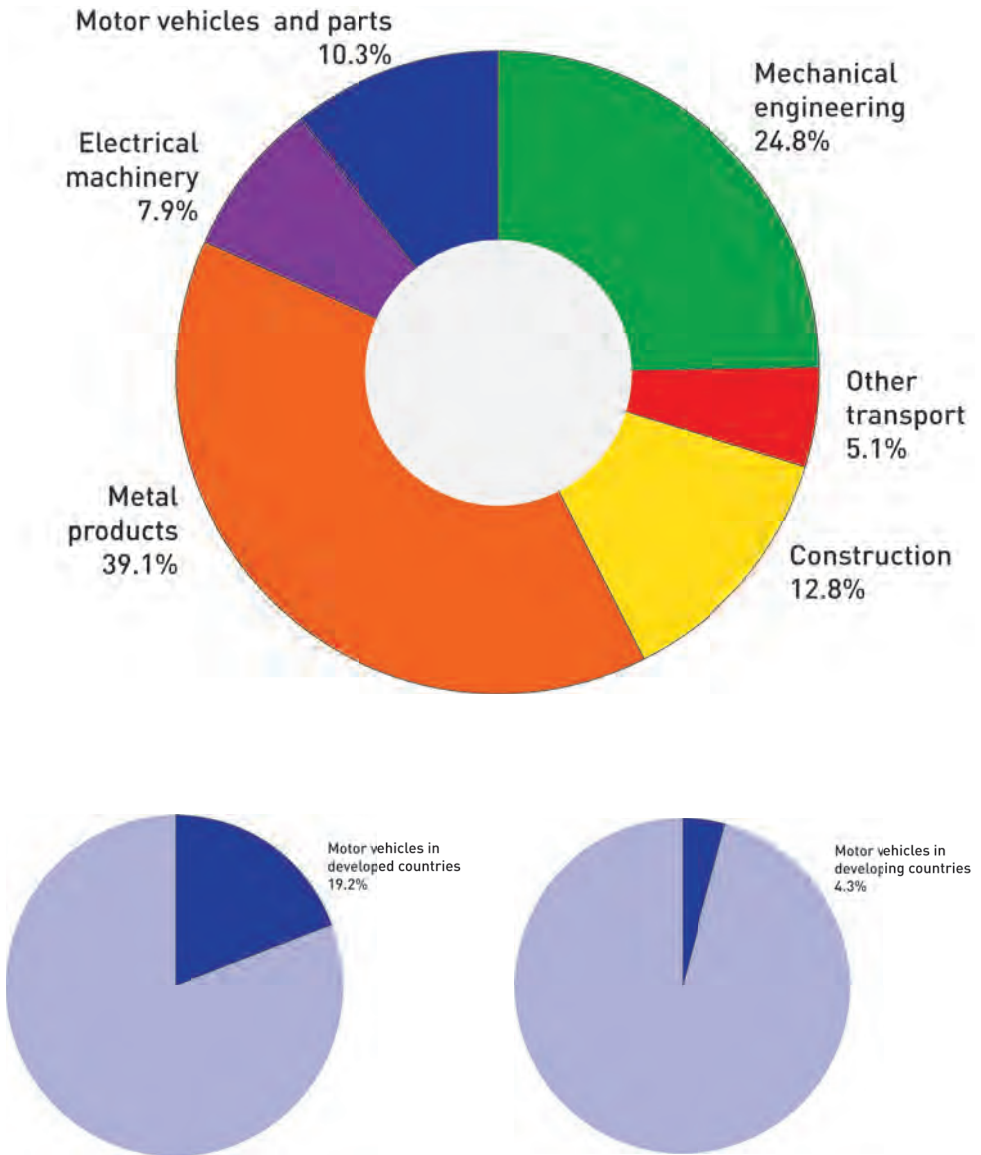


Figure 19: Stainless steel use by sector - 2013

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Section 4: Raw Materials - Chrome

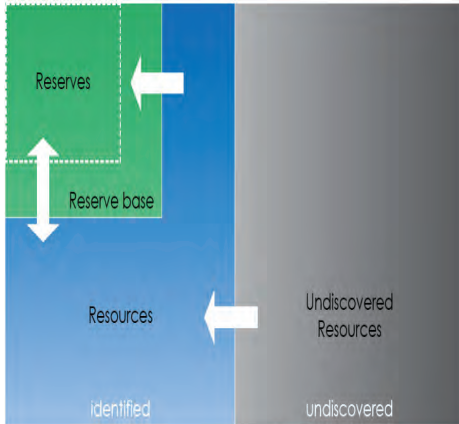


Figure 20: World chrome ore resources and reserves

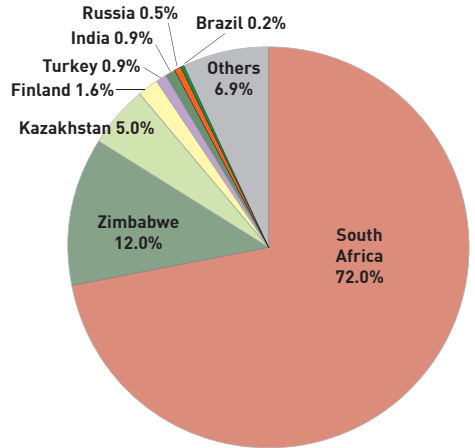


Figure 21: World chrome ore resources by country

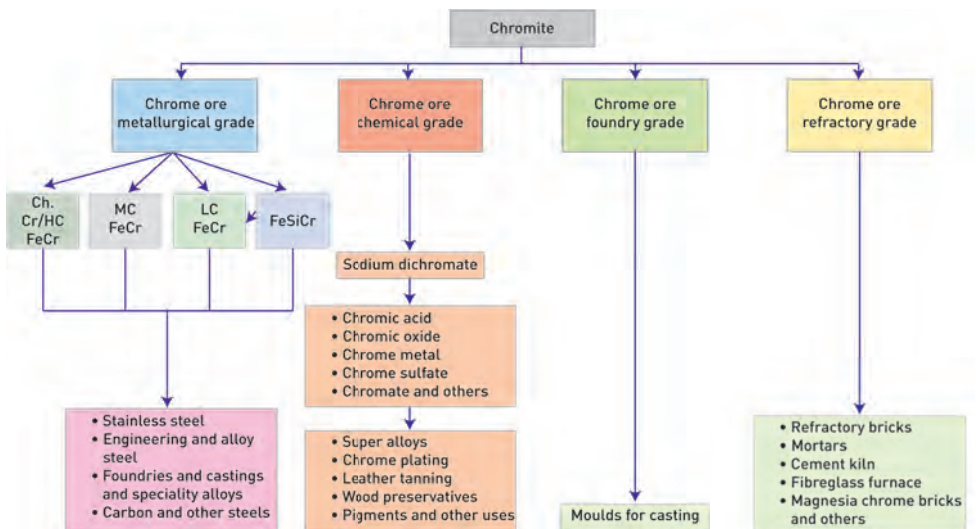


Figure 22: Chrome uses

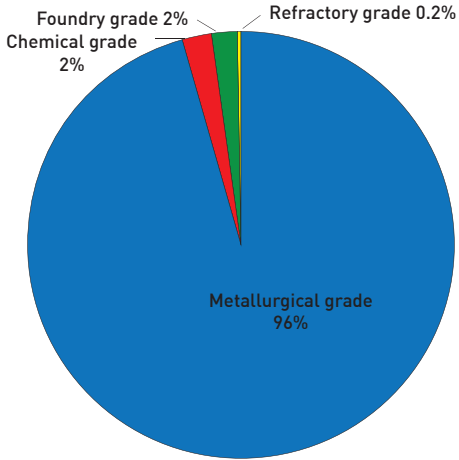


Figure 23: Chrome ore production by grade - 2014

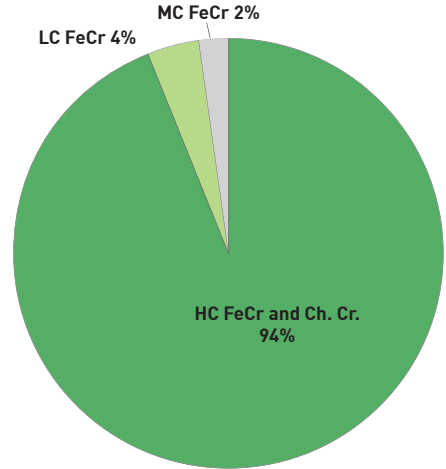


Figure 24: Ferrochrome production by type - 2014

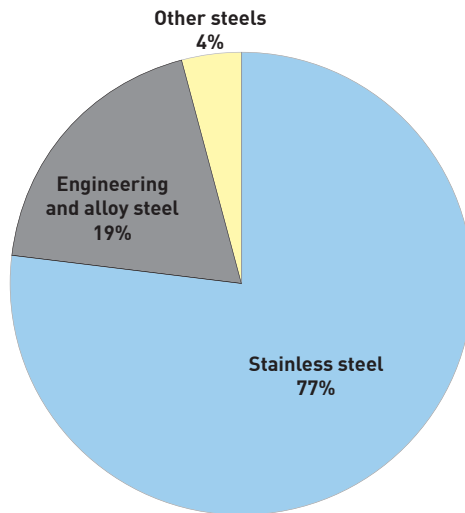


Figure 25: Ferrochrome applications - 2014



Section 4: Raw Materials - Chrome

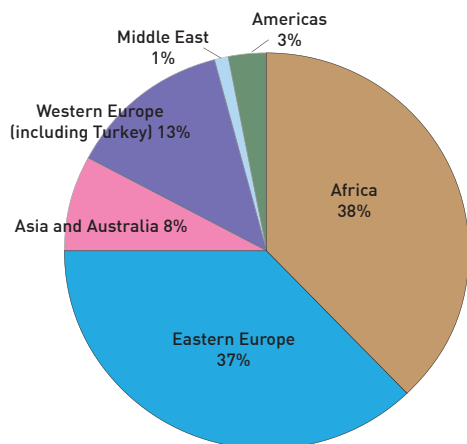


Figure 26: Chrome ore production by region - 1987

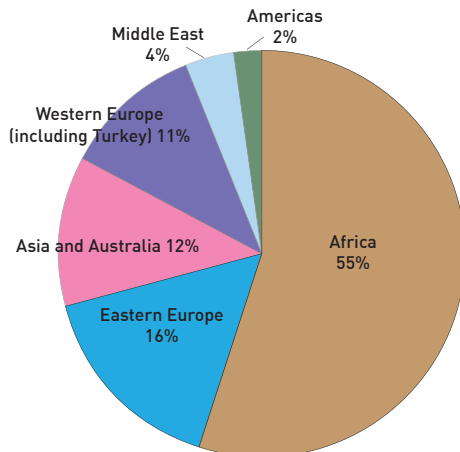


Figure 27: Chrome ore production by region - 2013

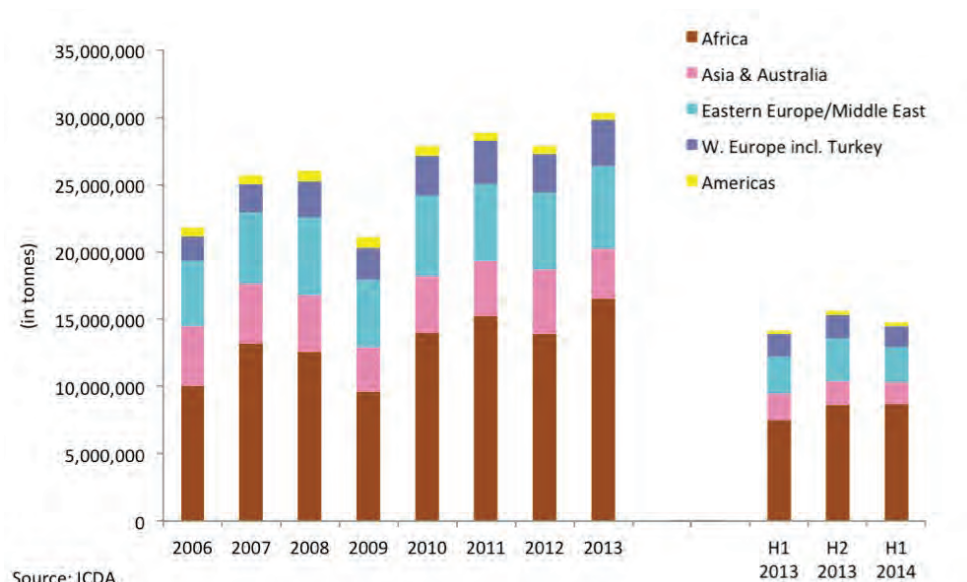


Figure 28: Chrome ore production by region



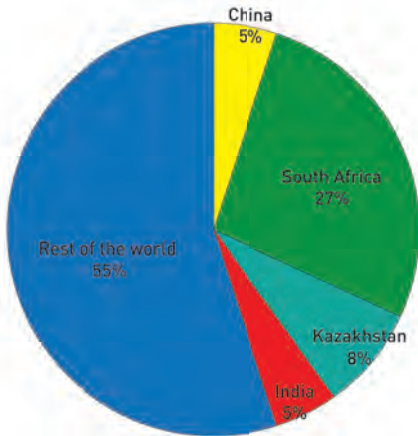


Figure 29: Ferrochrome production by country - 1987

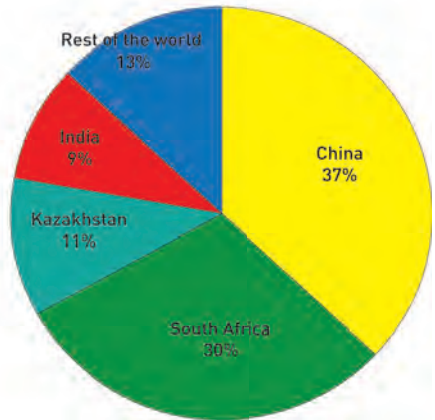
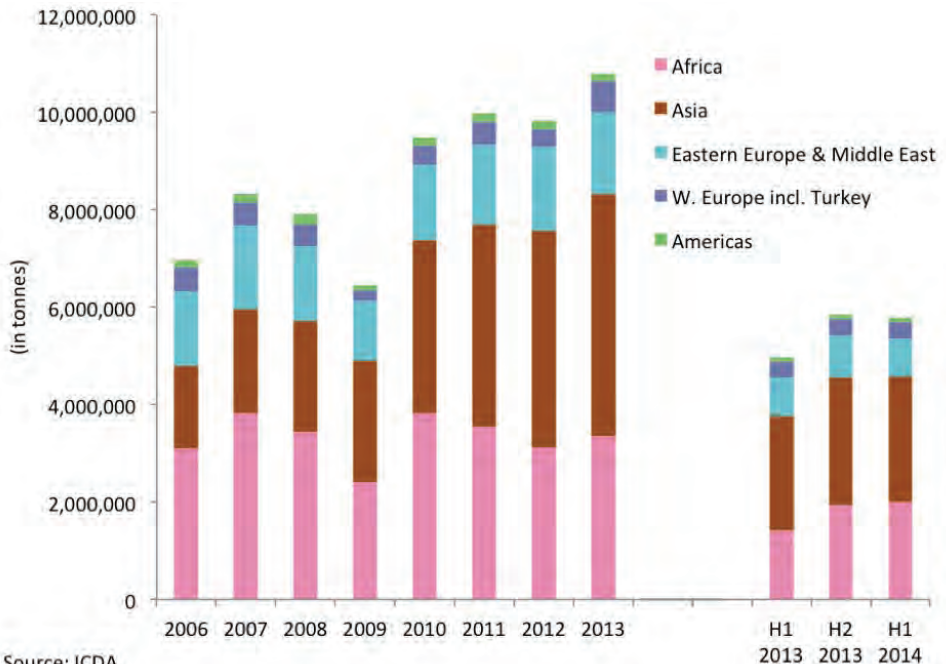


Figure 30: Ferrochrome production by country - 2013



Source: ICDA

Figure 31: Ferrochrome production by region



Section 4: Raw Materials - Chrome

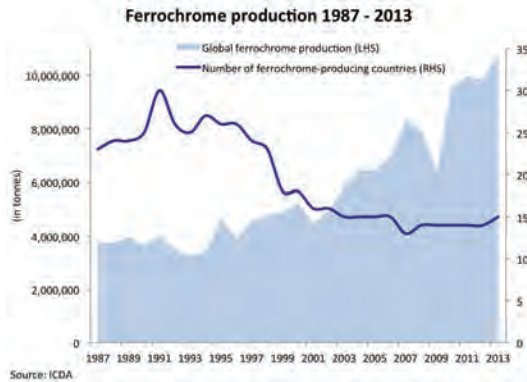


Figure 32: Ferrochrome production by number of producing countries

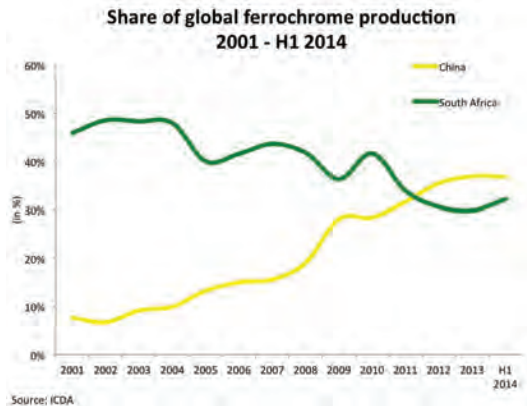


Figure 33: Share of ferrochrome production

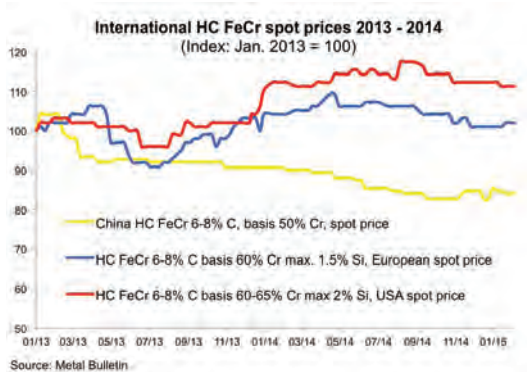


Figure 34: International HC FeCr spot prices (January 2013 = 100)





Section 4: Raw Materials - Nickel

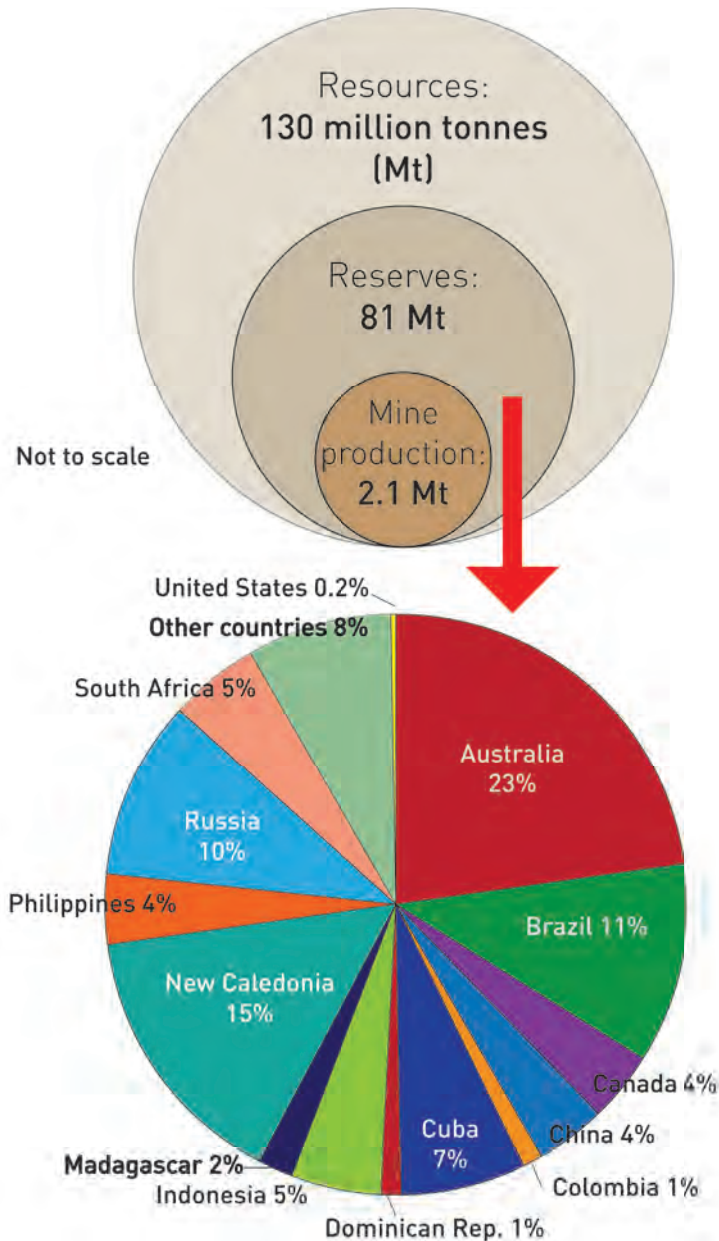


Figure 35: Nickel resources and reserves - 2014

4

Section 4: Raw Materials - Nickel

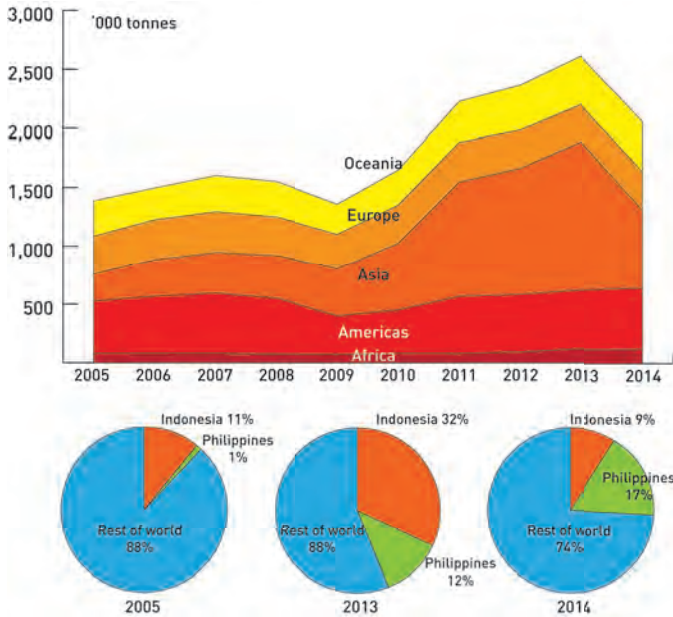


Figure 36: Nickel mine production by region

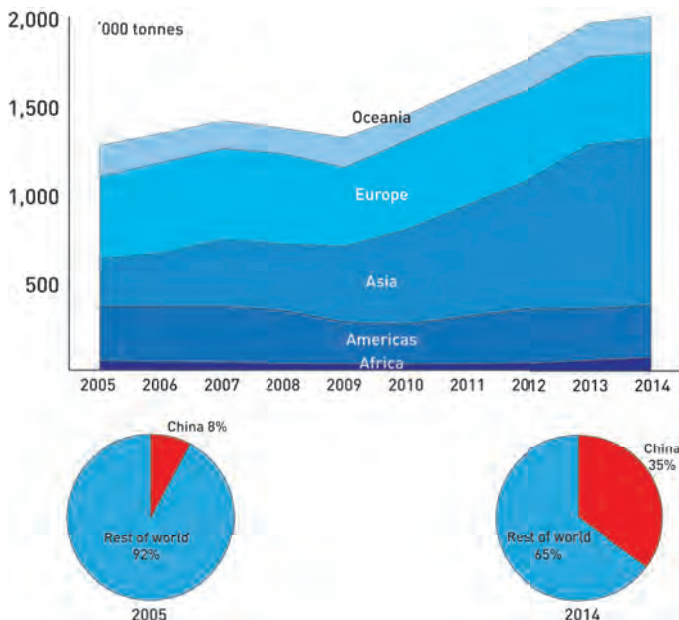


Figure 37: Primary nickel production by region

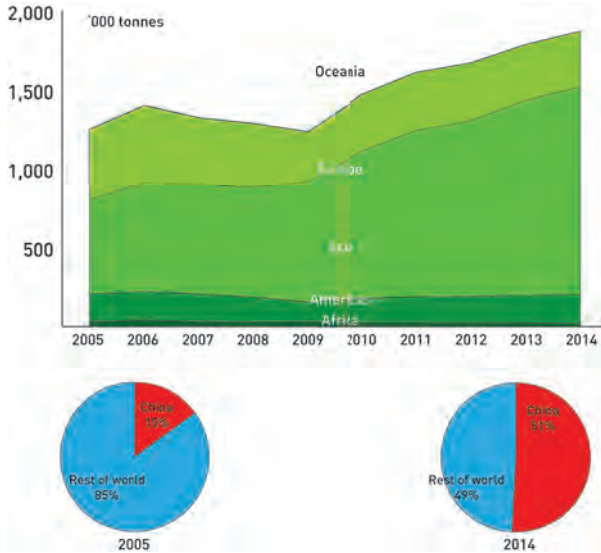


Figure 38: Nickel usage by region

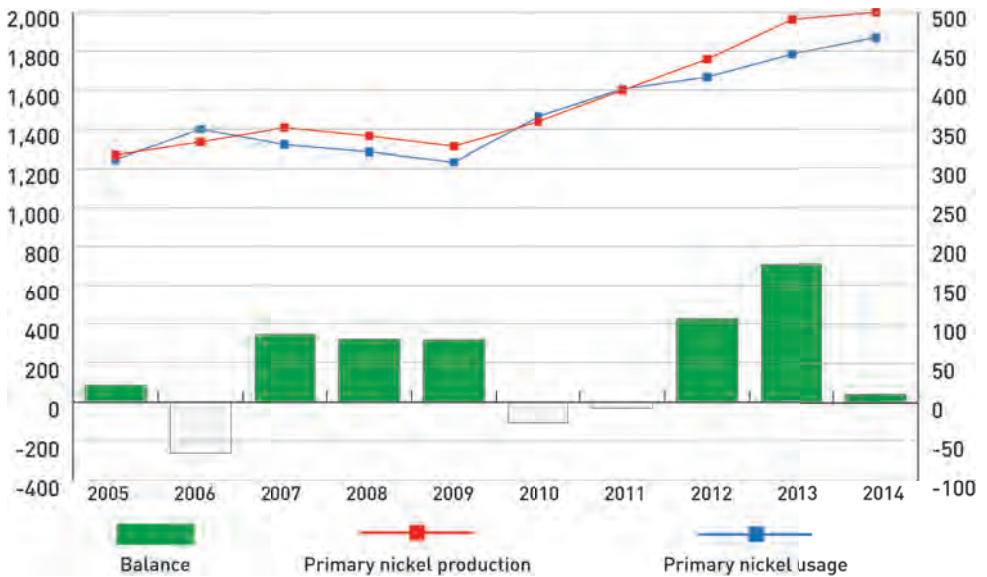


Figure 39: World primary nickel balance



Section 4: Raw Materials - Nickel



Figure 40: End of month stocks and average prices (LME Nickel)

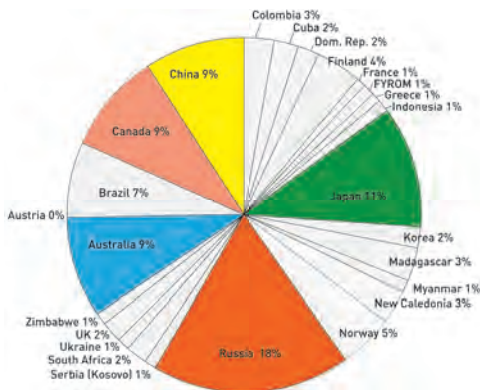


Figure 41: Primary nickel capacity by country - 2013

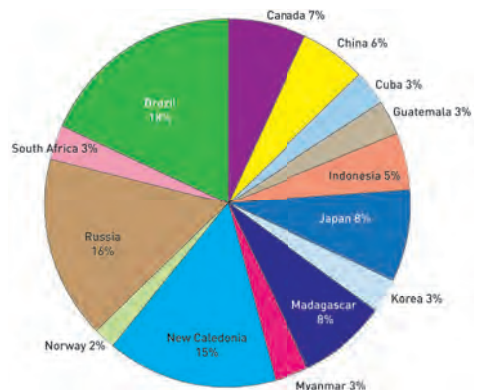


Figure 42: Primary nickel, new committed developments - 2013



Section 4: Raw Materials - Molybdenum

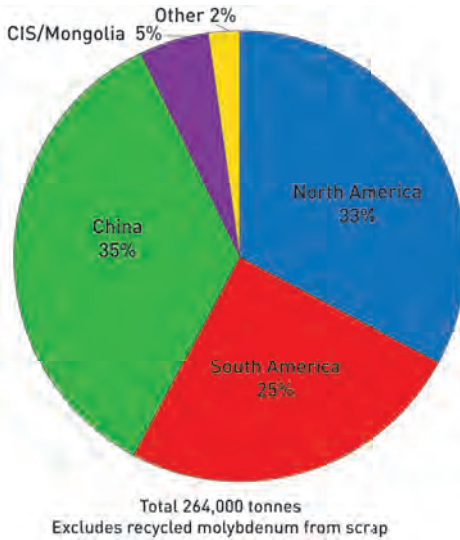


Figure 43: Molybdenum production by region - 2014

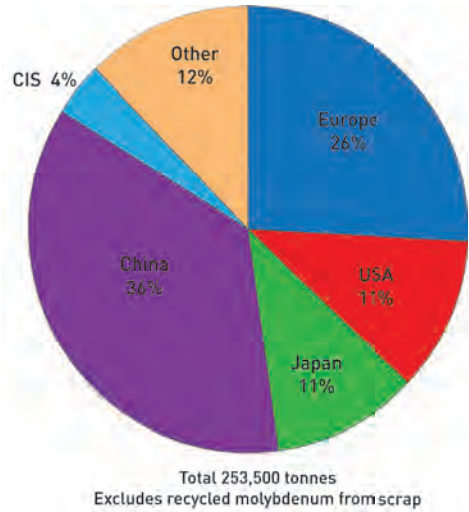


Figure 44: Molybdenum use by region - 2014

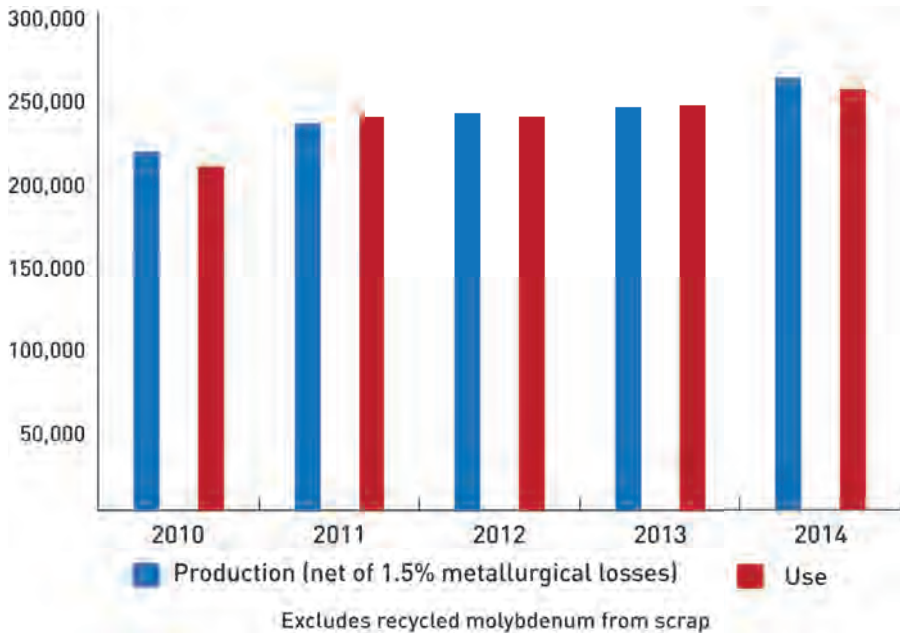


Figure 45: Molybdenum production and use - 2010-2014

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Section 4: Raw Materials - Molybdenum

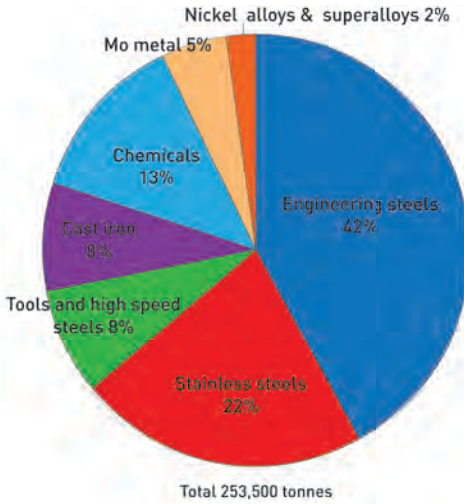


Figure 46: First use (excluding recycled Mo in scrap) - 2014

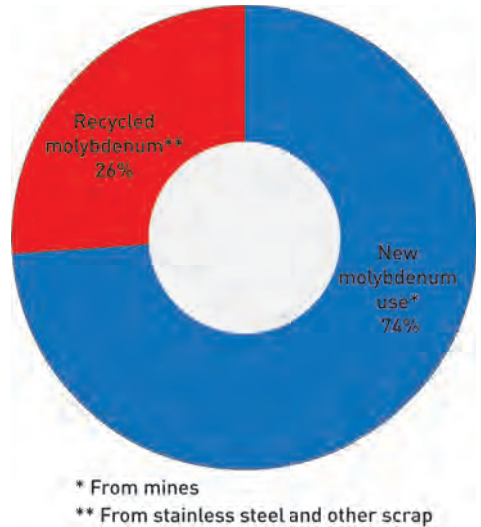


Figure 47: New molybdenum versus Mo in scrap - 2013

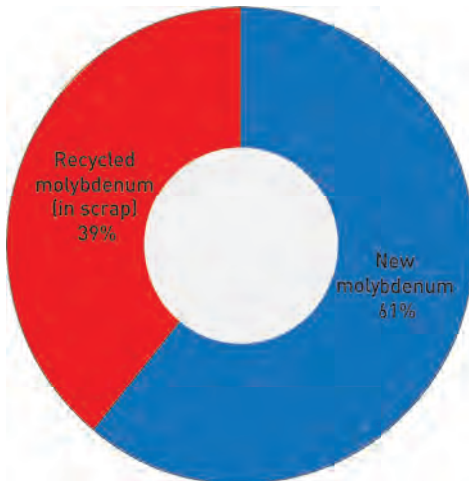


Figure 48: Recycled molybdenum content in stainless steel - 2013

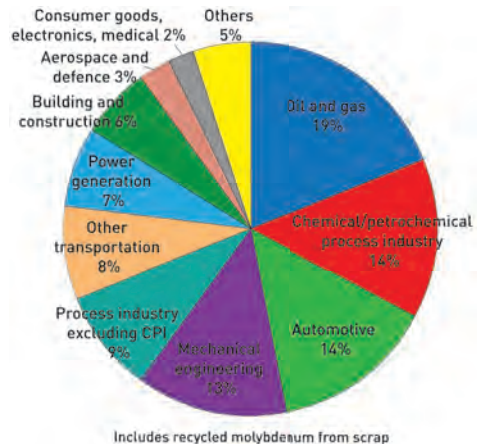


Figure 49: Molybdenum end use structure

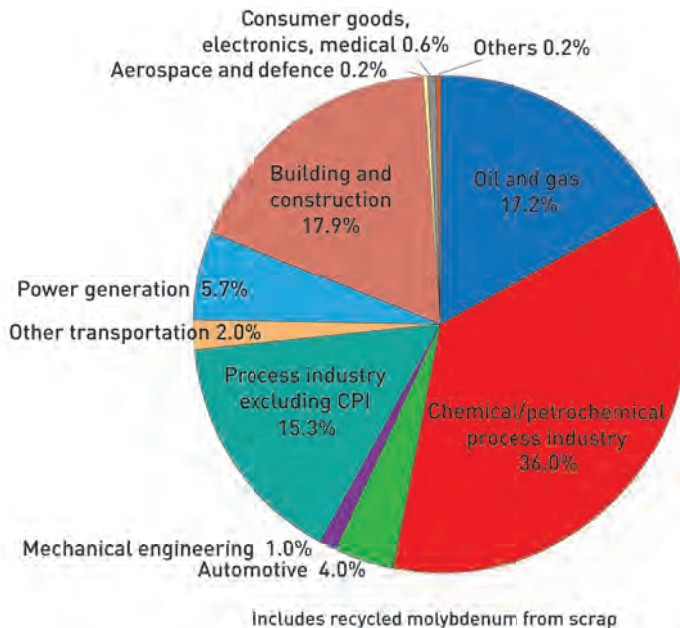


Figure 50: Molybdenum in stainless steel (tonnes Mo content) by end use

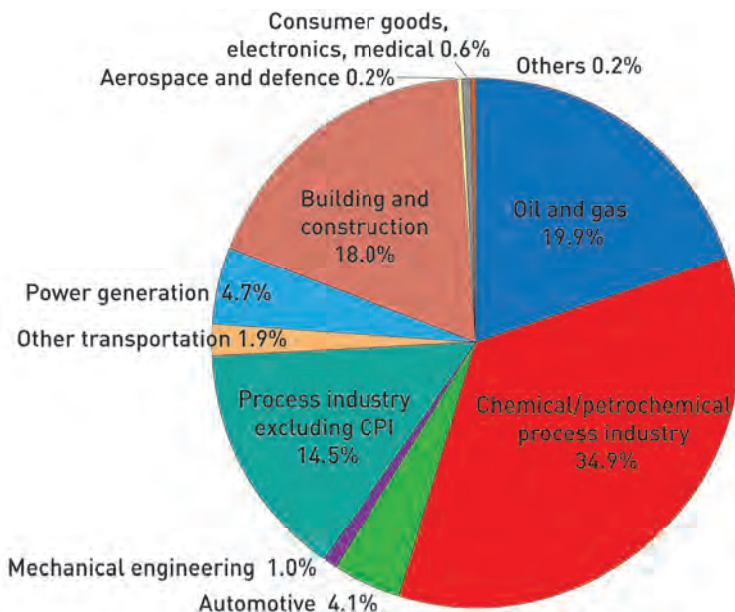


Figure 51: Molybdenum-grade stainless steel by end use (tonnes stainless steel)

Data Sources

Unless otherwise indicated, all data in this booklet has been provided by the International Stainless Steel Forum (ISSF).

Data has also been provided by:

1. International Chromium Development Association (ICDA)
2. International Molybdenum Association (IMOA)
3. International Monetary Fund (IMF)
4. International Nickel Study Group (INSG)
5. Vale Inco
6. Yale University: School of Forestry and Environmental Studies (Reck et al.)

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More information about the work of ISSF can be found at worldstainless.org.

Extranet

Members can access the worldstainless Extranet at:

<http://extranet.worldstainless.org>

Please note: you must have a valid user ID and password to access this site.

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www.worldstainless.org