Developments in stainless steel raw materials - a supplier’s perspective

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Stainless Steel Raw Materials – Trends and Issues

- Recent trends in raw materials use
- Future supply / demand dynamics and price trends
- Common issues and the need for a collaborative approach
Stainless steel value chain

Raw Materials
- Stainless Steel Scrap: 4.5 Mt, US$ 2.5 Bn
- Primary Nickel: 650 kt, US$ 4Bn
- Ferrochrome: 4 Mt, US$ 2 Bn
- Other Ferroalloys & Slag Formers: US$ 0.5 Bn?
- Steel Scrap: 7 Mt, US$ 0.7 Bn

Melting by Grade
- 75% Austenitic
  - AISI 300 series
    - 18% Cr
    - 8% Ni
    - 70% Fe
  - 12 Mt, US$ 24 Bn
- 24% Ferritic/Martensitic
  - AISI 400 series
    - 12 - 17% Cr
    - 80 - 90% Fe
  - 3 Mt, US$ 4Bn
- 1% Mn Grades
  - AISI 200 Series
    - 1 Mt, US$ 1Bn

Product Form
- Flat products
  - Sheet/Strip/Plate: 70%
    - 12 Mt, US$ 24 Bn
  - Flat Products: 30%
    - 3 Mt, US$ 4Bn
- Long Products
  - Bar/rod/wire: 80%
    - 6 Mt, US$ 12 Bn
  - Long Products: 20%
    - 1 Mt, US$ 2 Bn

End Use
- Process Plant
- Building & Construction
- Transportation
- Food/Beverages handling
- Automotive Consumer Durables
- Building & Construction
Global stainless production and raw materials use

- Stainless slabs: +10% in 1999, +22% in 2000, +6% in 2001
- Stainless scrap (purchased): -4% in 2000, -14% in 2001
- Ferrochrome: +1% in 2000, +1% in 2001
- Primary nickel: +5% in 1999, +1% in 2000, +1% in 2001
Stainless scrap supply is highly nickel price elastic

Scrap ratio

Ni LME cash US$/lb

4
3
2

60%
50%
40%

1998 1999 2000 2001

total scrap aust scrap Ni price
Primary nickel projected supply / demand

- 2002 capacity
- E/W trade
- Greenfield
- Depletion
- Brownfield
- Nickel use

220 kt gap
Ferrochrome - Supply / demand balance

- Based only on committed capacity expansions
- Demand growth at 5% pa
- Scrap ratio of 43%

*Capacity additions considered as effective capacity added
Stainless steel scrap trends

• Stainless scrap will always be a preferred raw material. It has lower melting point, convenient chemical composition and usually discounted price

• Revert and new scrap are likely to decline further as a proportion of the total, as technology improves

• Given the efficiency of recycling, the life cycle of stainless in use and a trend growth in stainless demand of 5% pa, we believe it will be difficult for the proportion of new melt provided by scrap of EU and USA origin to increase

• Yields from Japan may increase

• Scrap recovery from FSU unlikely to return to, and be sustained, at > 0.6 Mt/a rate of mid 1990s

• However scrap reservoir in FSU, particularly east of the Urals, is significant
Nickel price based on statistical trends

- Managed growth
  - 1970-1974 Average 5.00

- Producer pricing

- Impact of 16 new entrants;
  - Massive cost cutting

- Additional
  - 150 kt FSU Ni units in 1990’s

- LME contract

- 1983-2000 average 3.90

- 1983-1987 average 3.10

- Linear regression predicted value 3.28 in 2001*

- 1993-2000 average 3.25

Series deflated with US GDP Deflator

* correlation coefficient 0.03
FeCr price based on statistical trend

*Prices in real 2001 terms

Source: CRU US Import 50-55%
Issues needing greater future co-operation

- Environmental and health regulation
- Sustainable development
How are metals viewed by external groups?

• Green groups / politicians:
  – associate metals with “heavy metals”; “toxic compound”; issues such as dermatitis and cancer
  – see metals as hazardous substances - long term threat to health & environment

• The result is greater regulation and restriction to “protect society”

“If metals are hazardous, why do we have to use them?”

“Why risk it?”
Regulatory response

• Attraction of simplifications
  – Cutting and pasting Hazardous Substances Lists
  – Use of “science based tools” for ranking or priority setting

• Need for immediate action
  – Actions should be based on detailed risk assessment rather than over-simplification by the regulators
  – Actions should be based on risk not hazard
  – Proper account must be taken of speciation
  – The Precautionary Principle should be applied correctly
EU policies

• Ambient Air Quality
  – proposed lower Limit Value for ambient air by 2010 (for Ni 20 ng/m³ is proposed)
  – Surveys show for Ni:
    – major sources are power generating industry (coal burning) and motor vehicles
    – stainless mills also show as anomalies
  – legislation in preparation for roll out July 2002. Debate with industry has come late, but dialogue now ongoing to seek more informed Limit Values.

• Potential impact of industry is widespread (at proposed levels):
  – Power generation, auto-industry, aluminium smelters, steel industry, coke ovens, base metal smelters and refineries, and stainless steel mills.
EU Chemicals policy - key features (proposed)

- 30,000 substances to be registered (about 20 so far!)
- Evaluation for 5,000 PBTs
- Authorization for 1,500 CMRs and POPs
- Metals are considered to be chemicals
- Risk Assessments responsibility of supplier
- No data, no market - failure to register or incomplete data will render illegal production or sale of a substance
- Data required on full life cycle of chemicals, including EOL
Sustainable Development

• Public accountability on a “triple bottom line” basis
  – Social -- Economic – Environmental
  – “Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs” (UN 1987)

• BHP Billiton is committed to SD. Alloys made with out Ni and Cr meet the SD criteria:
  – Corrosion resistance – infrastructure of civilization lasts longer
  – Durability – products and processes of civilization last longer
  – Recyclable
    – nickel and chrome are used, not consumed
    – Ni and Cr produced by BHP Billiton and sold to Stainless Steel remain a resource for the future, to be reprocessed with relatively low energy requirements
End-use manufacturers: emerging messages

- **Traditional Marketing Model**
  - cradle to grave
  - manufacturers sell things
  - consumers consume
  - manufacturers have poor or low involvement with consumers
  - end of life responsibility lies with consumer or government

- **New Model**
  - cradle to cradle
  - manufacturers provide service
  - consumers have automated services in household
  - manufacturer builds long term relationship with consumer based on SD principles
  - social and environmental responsibility assured throughout the value chain