Stainless & specialty steels market dynamics: Implications for ferroalloys

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- Established 1955 and employee owned
- Over 8000 highly skilled employees in 80 offices on six continents
- US$20BN of capital projects now under management globally

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- Quality
- Innovation
- Sustainable development
- Effective risk management

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Plant level	Benchmarking, competitor profiling, cost studies, operations management and support
Floor level	Control systems, operating floor assistance, operator training

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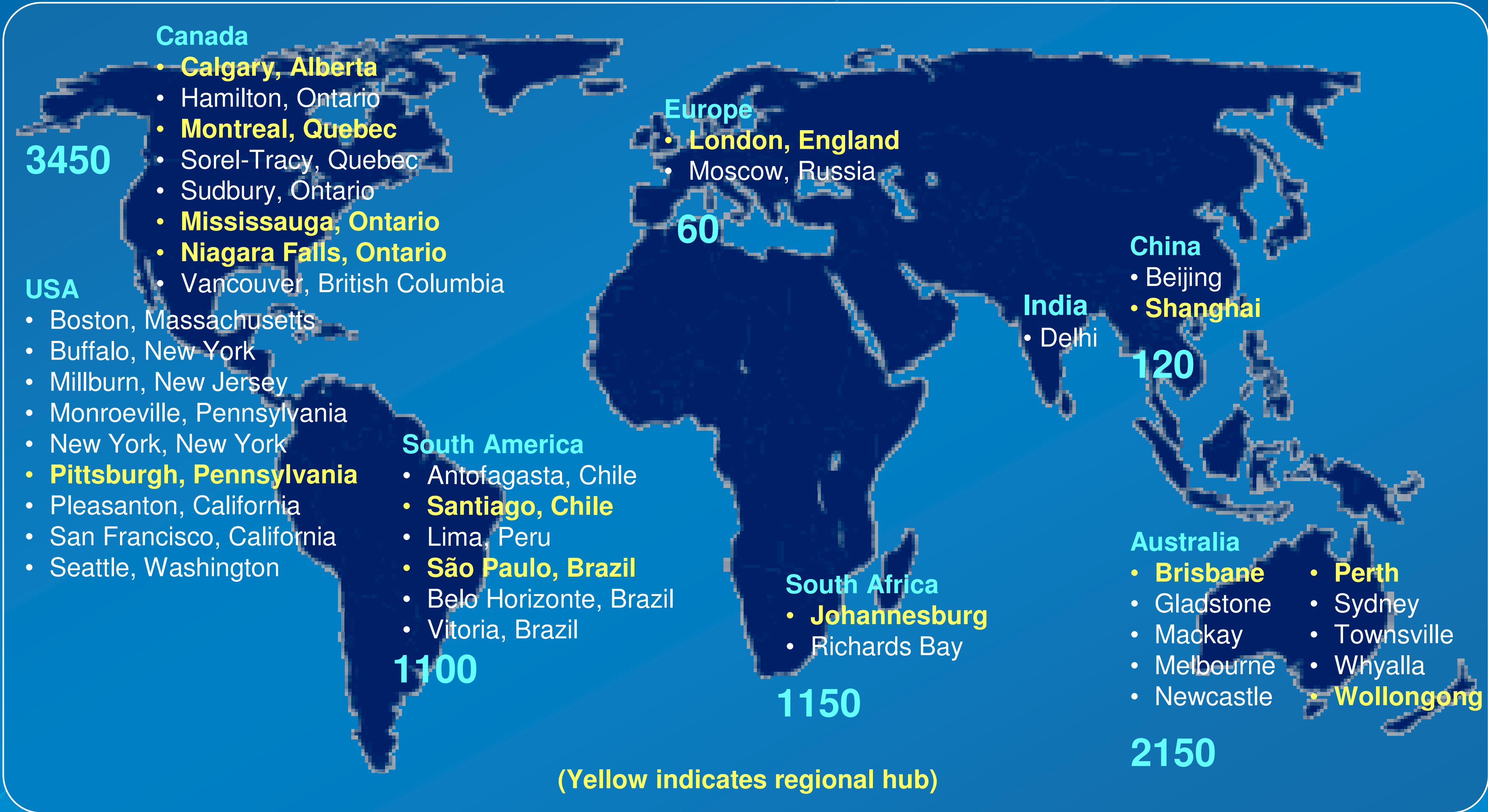
8000 people – November 2008



Hatch Beddows is the leading strategy consulting service specialising in the global steel and related industries

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- **Hatch Beddows** provides the following suite of services to its clients worldwide
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  - Business unit strategy development
  - Corporate development and restructuring
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  - New product and market development
  - Investment analysis
  - Market analysis
  - Business planning

Hatch Beddows brings together a unique combination of commercial and technical knowledge and expertise to provide unparalleled benefits for its clients

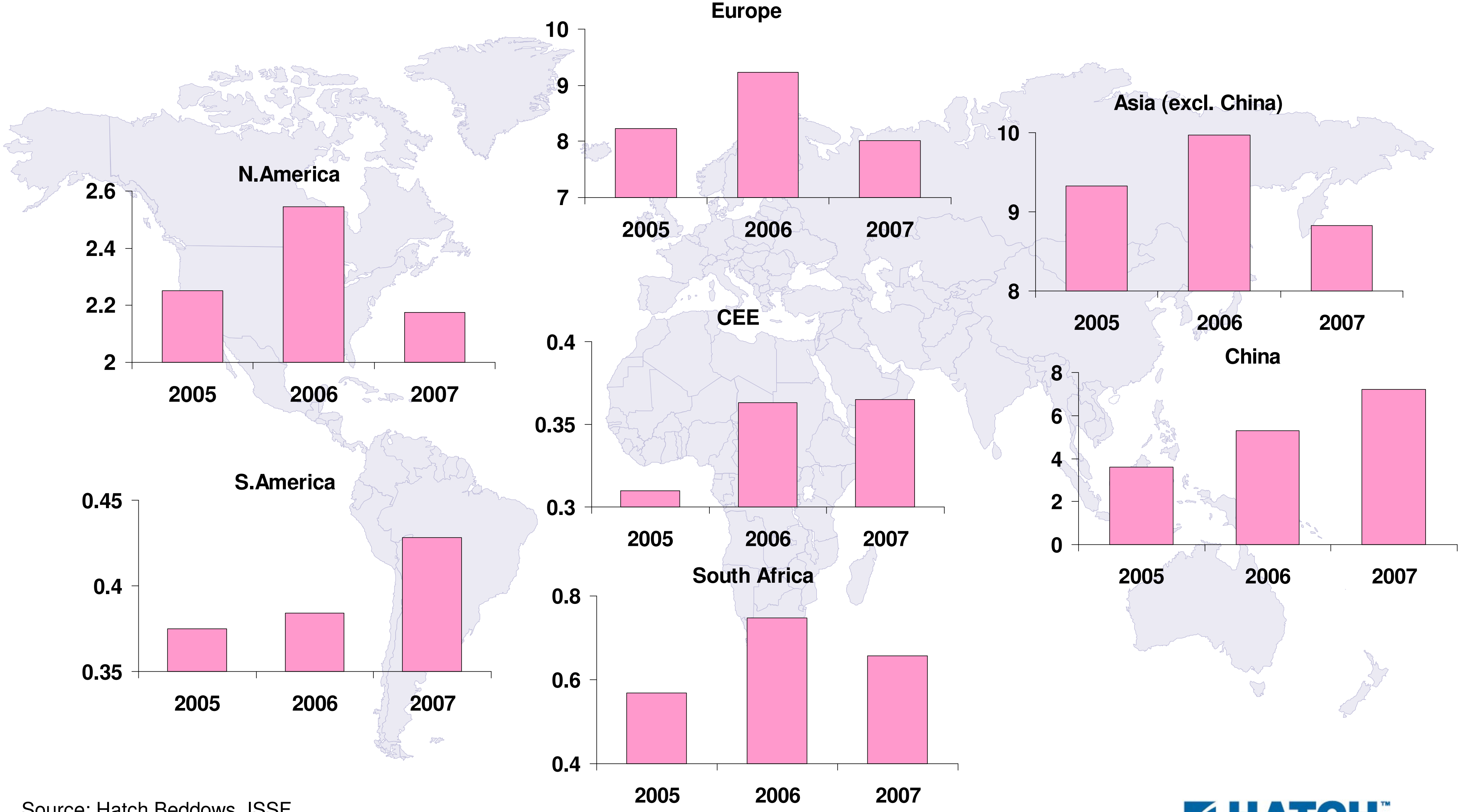
Hatch Beddows' project experience spans the whole of the value chain from raw materials to finished steel to processed products for a comprehensive perspective

- **Raw materials and consumables**
  - Iron ore, pellet and sinter
  - Coking coal and coke
  - Metallics: scrap, pig iron, DRI / HBI
  - Ferroalloys: Cr, Mn, Ni, Si
  - Refractories
- **Semi-finished steel**
  - Slab
  - Billet and bloom
- **Long products**
  - Rebar
  - Merchant bars
  - Structural sections
  - Wire rod and wire products
  - Engineering bars
  - Rails
  - Grinding balls
- **Reversing mill / Steckel mill plate**
- **Strip mill products**
  - HR sheet / plate
  - CR sheet
  - Electrical steels
  - Galvanised sheet
  - Organic coated sheet
  - Tin mill products
  - Tailor-welded blanks
- **Pipe and tube**
  - OCTG and line pipe
  - Seamless and welded tubes
  - Hollow sections
- **Stainless steel**
- **Speciality steels and special metals**

Following a nickel price spike in 2007 and due to the rising influence of China and India, the share of low- or no-nickel stainless in global production has increased

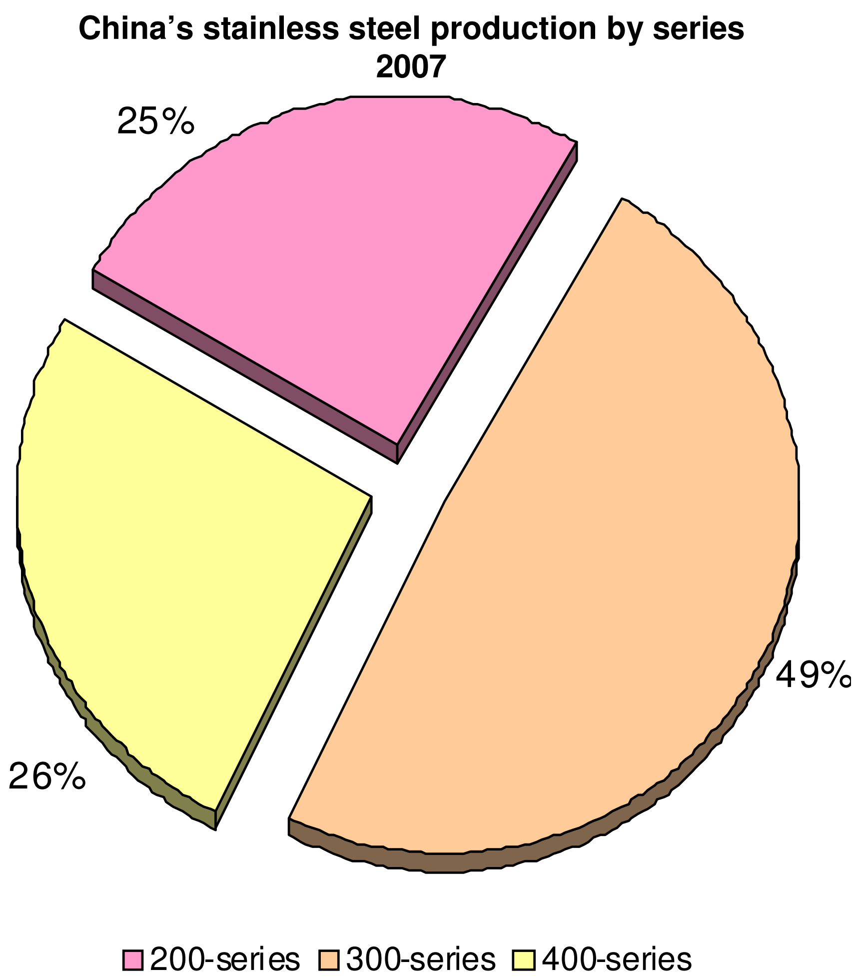
Source: Hatch Beddows, ISSF

In 2007, global stainless steel production was 27.6m tonnes. China is driving much of the current and future production growth



Source: Hatch Beddows, ISSF

China's stainless steel production has historically focused on 200- and 300-series production, although the share devoted to no-nickel 400-series stainless is growing

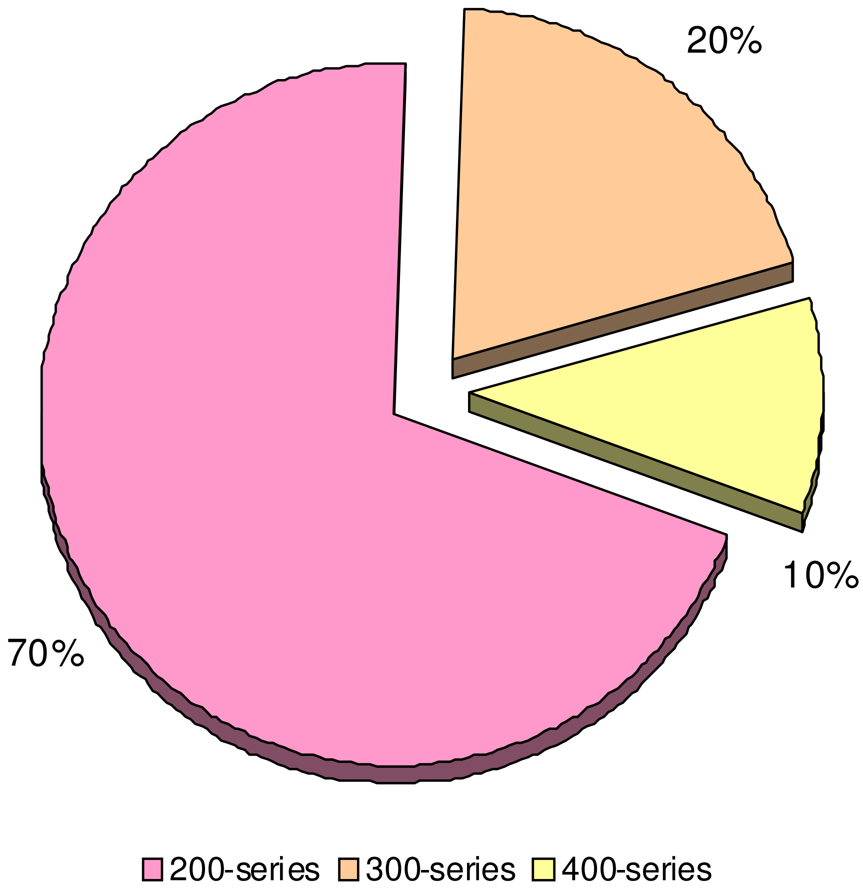


- China's production characterised by:
  - Historic focus on 200- and 300-series stainless steels
  - Increased production of 400-series in recent years
- Two largest producers, TISCO and Baosteel, have dedicated research to production of 400-series grades
  - TISCO now world's largest 400-series producer
- Increase in use of NPI in 2007 also a sign of producers keen to mitigate against rising raw material costs

Source: Hatch Beddows

Indian stainless steel production is dominated by the large presence of 200-series, leveraging the easy availability of FeMn and FeCr

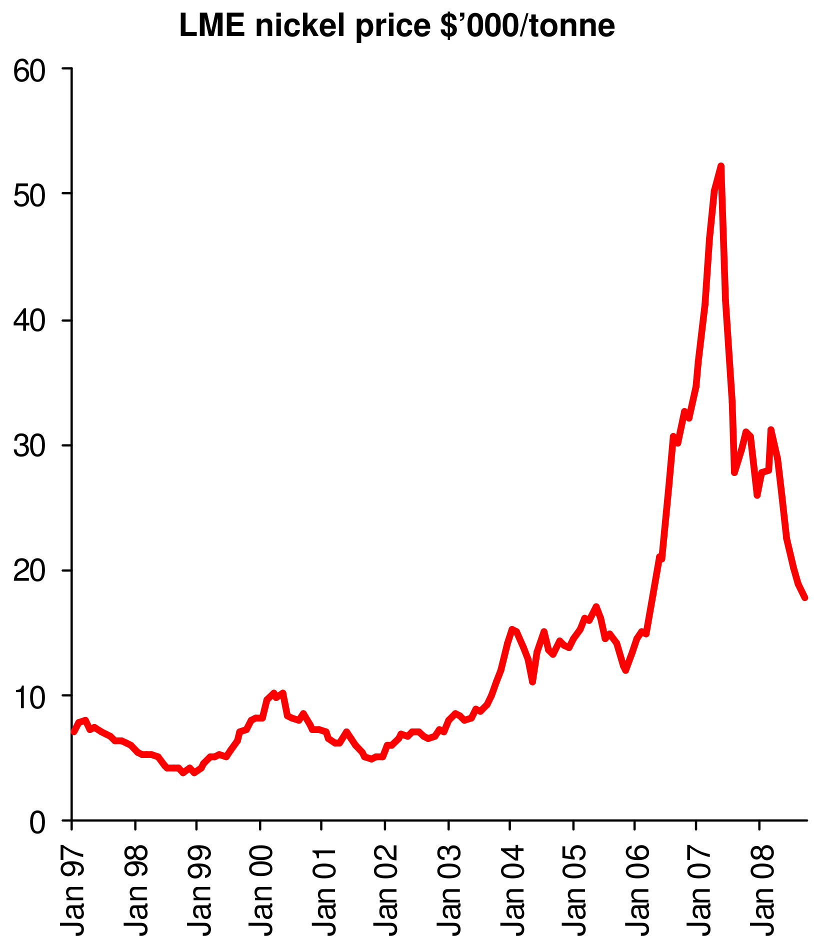
Indian stainless steel production by series 2007



- India's stainless steel production historically centred on 200-series
  - Legacy of expensive Ni during late 1980s
  - Ready domestic availability of Cr, Mn
- India reliant entirely on imports for primary nickel supplies
- The product mix is not likely to undergo a dramatic shift in the near future
  - Two of the biggest expansions, by Facor and Jindal Stainless, will both focus on utilising captive ferrochrome and ferromanganese reserves for the production of 200-series products

Source: Hatch Beddows

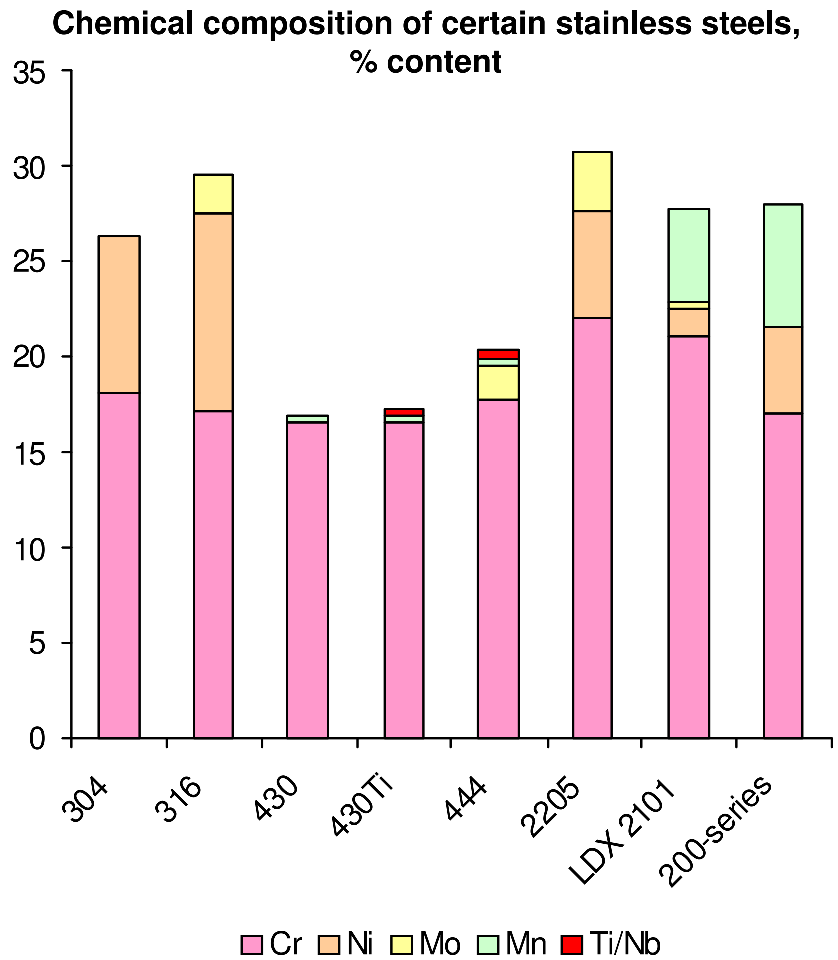
The volatility in nickel prices has increased the desire of stainless steel producers to minimise their exposure to this metal where possible



- The Ni price rose by 259% between January 2006 and May 2007
- Inventory write-downs leading to big losses by stainless steelmakers
- Harms investor sentiment
- Loss of market share to producers of low-/no-nickel stainless or alternative materials e.g. Al, plastics, coated steels

Source: Hatch Beddows, LME

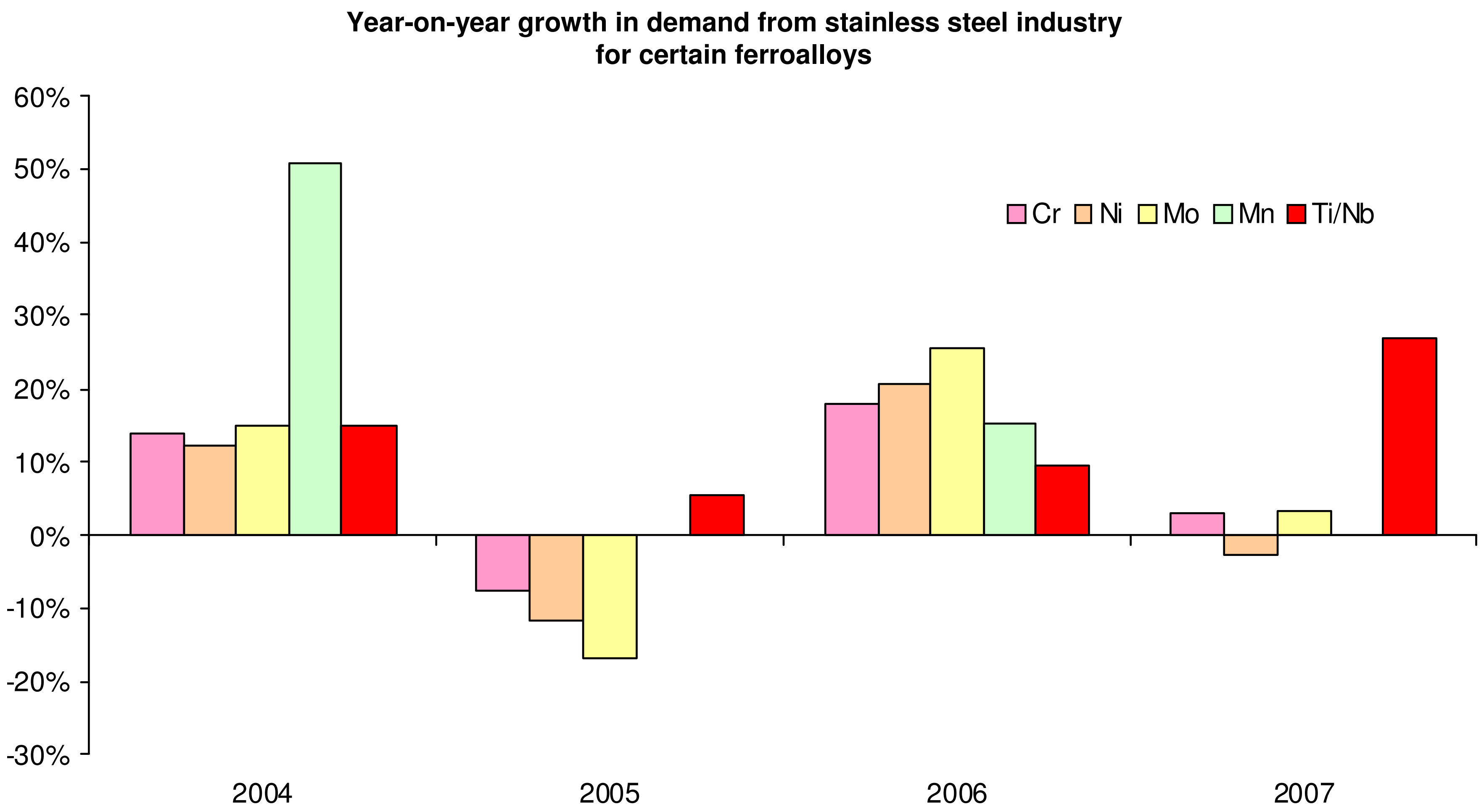
Substitution away from common 300-series stainless grades to 200-, 400- and duplex grades will have mixed affects on demand for key ferroalloys



- Substitution primarily driven by desire to reduce exposure to Ni price volatility
- Mn and Ti/Nb demand benefiting the most from substitution efforts
- Ti/Nb likely to be long-term beneficiaries as 'stabilising' elements in 400-series grades
- 200-series may continue to suffer from image problem, constraining Mn demand growth

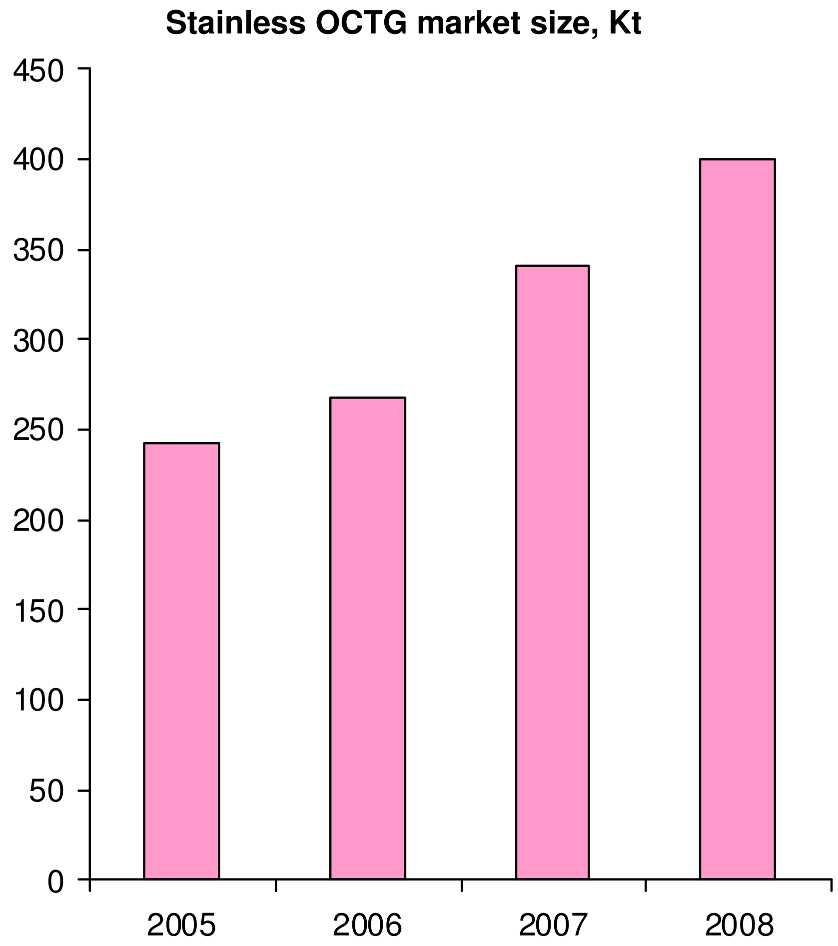
Source: Hatch Beddows, AK Steel, Outokumpu, Ugine & ALZ

The consumption of titanium and niobium by the stainless steel industry has grown even during periods of downturn in recent years



Source: Hatch Beddows

The use of stainless steels by the oil and gas industry is increasing as harsher environments for drilling and exploration demand tougher materials

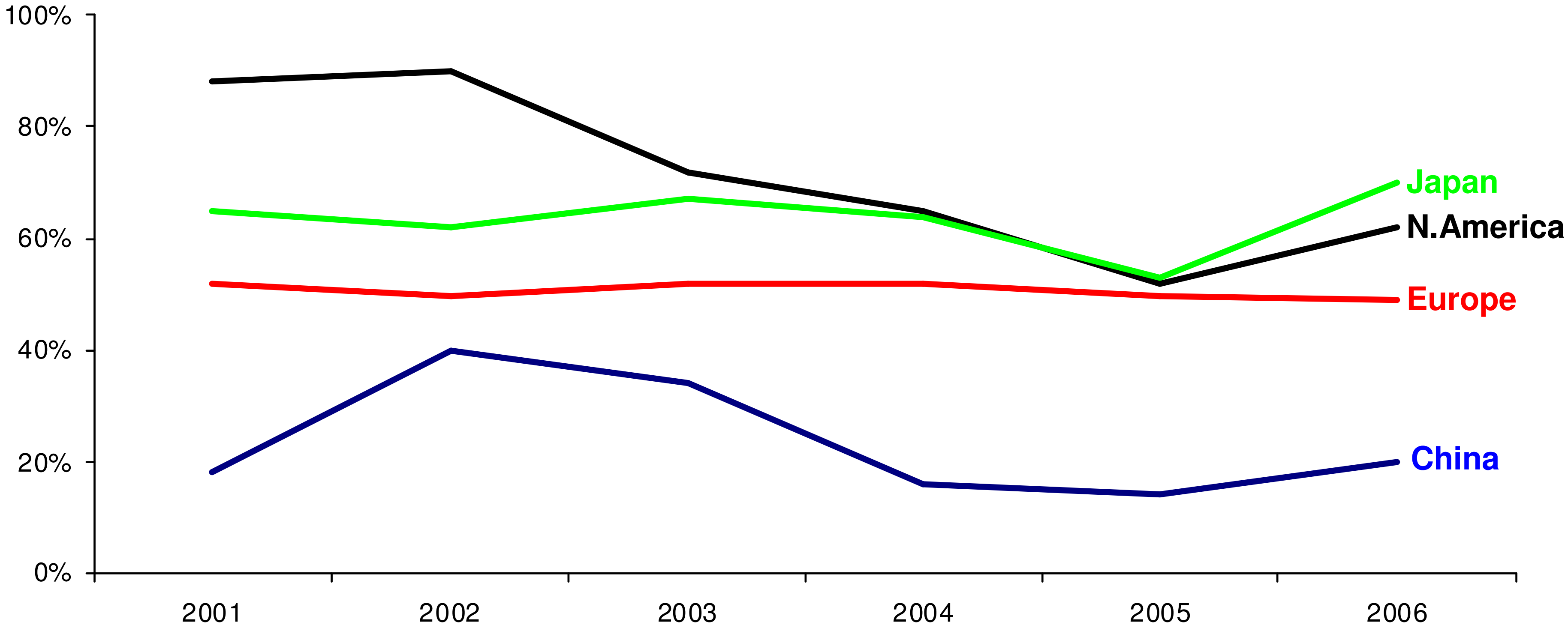


- Stainless OCTG market size increased by 60% since 2005
- Increased demand being driven by harsher drilling environments
  - Vast, easily-accessible oilfields being depleted
  - New fields primarily smaller, more difficult to access
  - Higher oil prices make such drilling more economically viable
- Falling demand growth for oil (and consequent price falls) may limit future investments in drilling/exploration

Source: Hatch Beddows

China's scrap ratio is much lower than in mature regions, hence growth in its stainless output translates more heavily into growth in FeCr demand

% of Cr units in austenitic stainless steel obtained from scrap ("scrap ratio")



Source: Hatch Beddows

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