



COMMODITY PROFILE– NICKEL

Nickel is a metallic chemical element with the symbol Ni. It is making up 0.008% of the Earth's crust and is the fifth most common element in the earth. It is a silvery-white lustrous metal with a slight golden tinge. Nickel is found predominantly in two types of ore bodies: sulfides and laterites. These deposits are found in tropical zones such as New Caledonia, Indonesia, Cuba and Brazil. Sulfide deposits tend to occur deeper below the surface, where nickel occurs as the compound $(Ni, Fe)_9S_8$. Laterite deposits occur closer to the surface, where nickel occurs in oxide compounds (limonites) and silicate compounds (saprolites).

Around 70 per cent of the world's nickel resources are contained in laterite ores, yet world's nickel production predominantly comes from sulphide ores. This is because nickel sulfides are easier to process and cost less to develop, despite being more difficult to access because of their depth. Nickel is a transition element that exhibits a mixture of ferrous and nonferrous metal properties. Nickel is hard, malleable and ductile and has relatively low thermal and electrical conductivities, high resistance to corrosion and oxidation, excellent strength and toughness at elevated temperatures, and is capable of being magnetized.

Uses

Nickel is primarily used in stainless steel. Approx. 65% of nickel is used in production of stainless steel. The most common grades of stainless steel contain between 8% and 12% nickel. A further 20% of nickel consumption is used to produce other steel and non-ferrous alloys, including super alloys often for highly specialized industrial, aerospace and military applications. Nickel is used as a catalyst for the hydrogenation of vegetable oils. Its ability to sustain at high temperatures finds its usage in rocket engines and fuel turbines. 9% of nickel is used in electro-plating with about 6% being used in coins and nickel chemicals.

Products of Nickel

Mined Products- The bulk of the nickel mined comes from two types of ore deposits. The first are laterites where the principal ore minerals are nickeliferous limonite and garnierite. The second are magmatic sulfide deposits where the principal ore mineral is pentlandite.

Intermediate Products- Intermediate products of nickel are matte, mixed sulphide concentrates (containing more than 35 per cent combined nickel and cobalt), and other intermediate products of nickel metallurgy, including salts and oxides for further refining.

Primary Nickel Products- Primary nickel products are nickel contained in products of smelters and refineries in a form which is ready for use by consumers. This includes:

Refined nickel (class I) - products with a nickel content of 99% or more. This includes nickel in form of Electrolytic nickel, Pellets, Briquettes, Granules, Rondelles and Powder/Flakes.

Charge nickel (class II) - products with a nickel content of less than 99%. This includes Ferro-nickel, Nickel oxide sinter, Utility and Nickel pig iron.

Chemicals- Nickel is also available in form of chemicals. This includes Chemical nickel oxide, Nickel sulphate, Nickel chloride, Nickel carbonate, Nickel acetate and Nickel hydroxide.

Secondary Nickel Products- Secondary nickel is basically the nickel bearing scrap which is the obsolete austenitic stainless steel scrap evolved from the demolition of obsolete factories, machinery, equipment and consumer goods. This is the largest source of scrap. Another source of nickel is the Internal Scrap which is generated during melting and rolling processes. Generally, the nickel content in the scrap is about 8%.

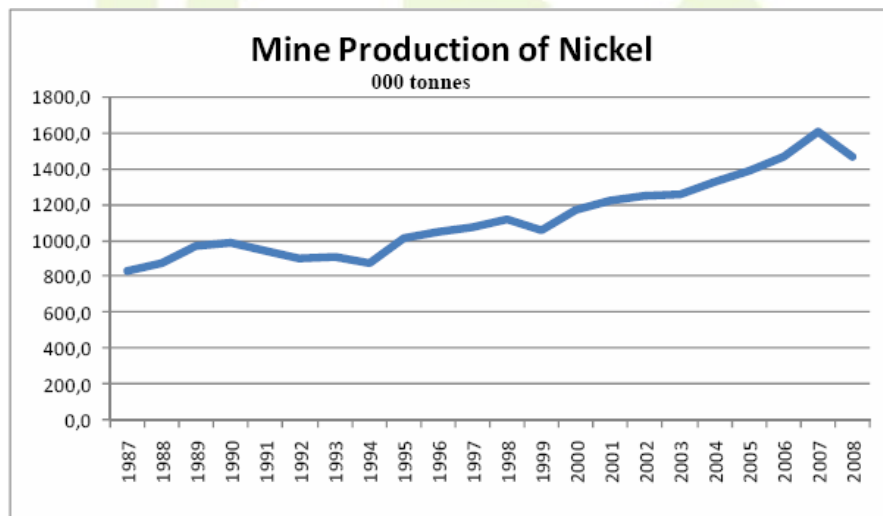
Global Scenario

Major producers of Nickel are Russia, followed by Australia, Canada, New Caledonia and Indonesia, which represents over 65% of total world production. Other nickel producing countries are Colombia, Philippines, China, Cuba and Brazil. Russia has the largest nickel mining nation supplying 18.2% of the market in 2008. Australia has substantial nickel resources, followed by Cuba & Canada.

Developing countries such as China and India play a major role in the growth of global nickel industry. But the developed countries such as the US, the UK, and Germany also witness strong demand as these countries have large automotive and aerospace industries.

Nickel Mine Production

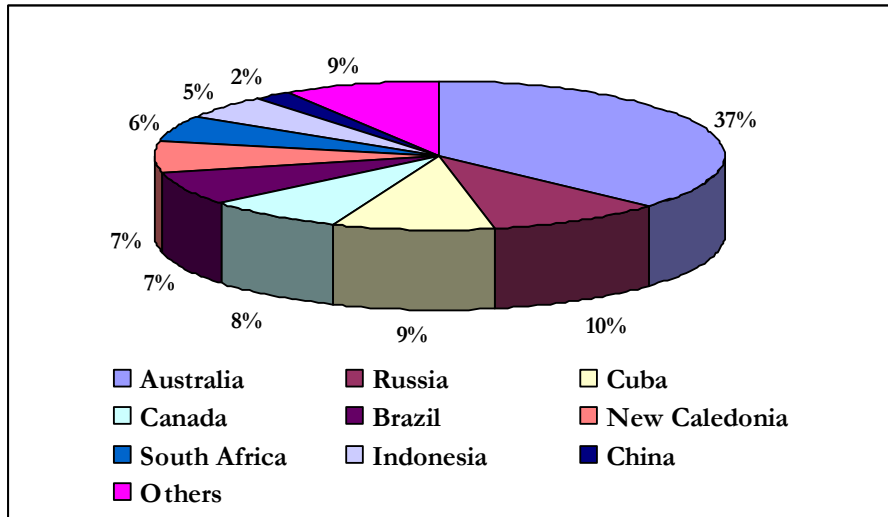
Fig. 1: Nickel Mine Production Trend (1987-2008)



Source: International Nickel Study Group

World mine production of nickel showed an increment from year 1999 to 2007 and then dropped 8.1% from 2007 to 2008. Nickel production has witnessed a slump in 2008 as a result of severe economic downturn across the globe.

Fig. 2:Country-wise Mine Production % share in 2007

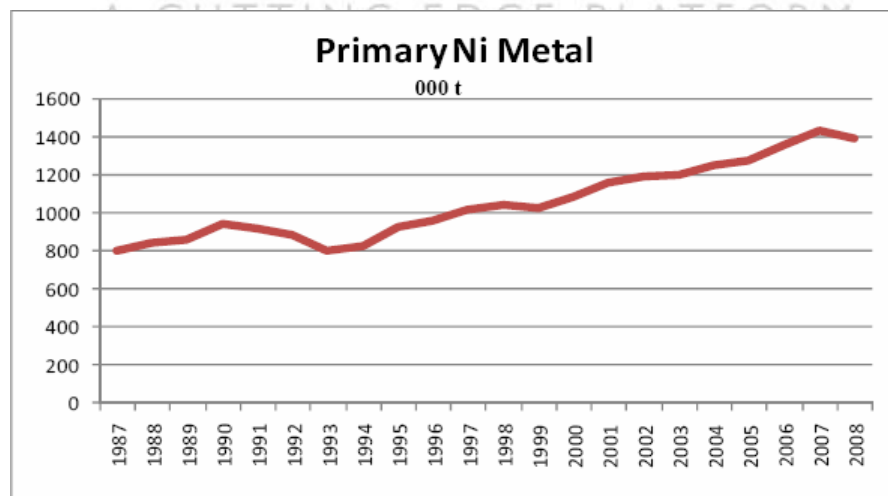


Source: International Nickel Study Group

Australia tops the nickel mining production, followed Russia, Cuba, Canada, Brazil, New Caledonia, South Africa, Indonesia and China.

Primary Refined Nickel Production

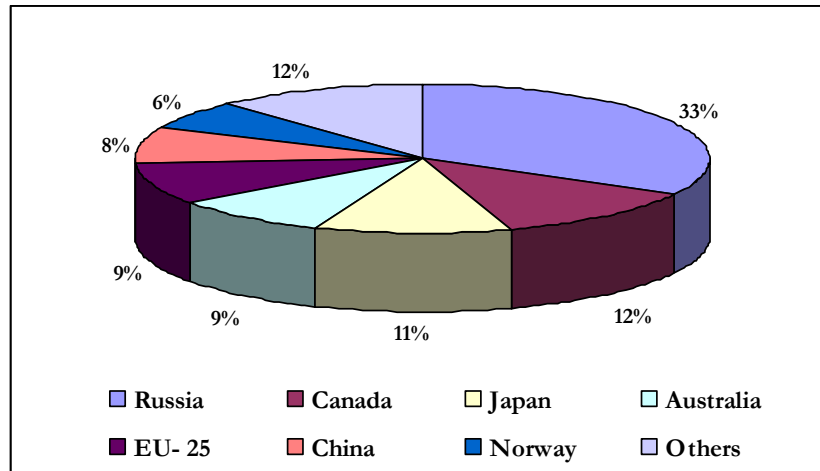
Fig. 3: Nickel Refined Nickel Production Trend (1987-2008)



Source: International Nickel Study Group

World primary nickel production has averaged growth of 3% per annum over 20 years to 2007 and then declined to 2.8% in 2008. In 2008, world primary nickel production was 1.39 million tones, lower from previous year production of 1.42 mtn.

Fig. 4: Country-wise Refined Nickel Production % share in 2008



Source: International Nickel Study Group

The major primary refined nickel producer's country wise are Russia, Canada, Japan, Australia, E.U-25, China and Norway.

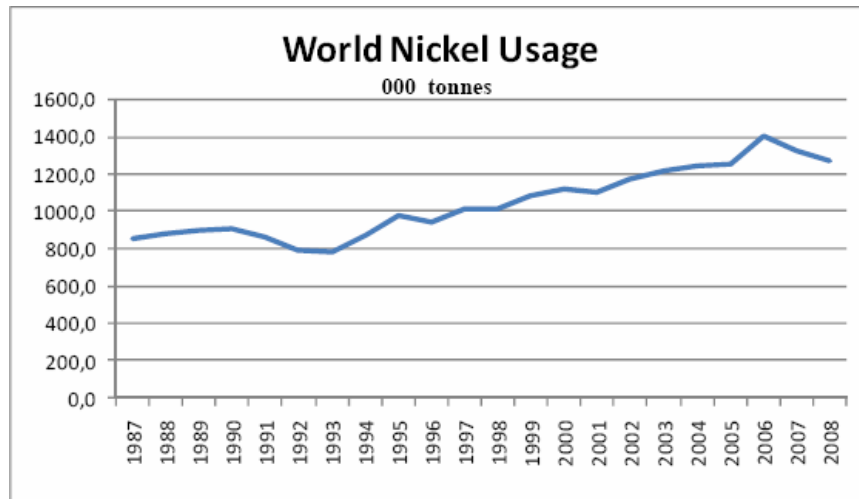
A CUTTING EDGE PLATFORM

World Nickel Consumption

Emerging economies such as India and China play a major role in the growth of global nickel industry along with developed countries such as US, UK and Germany, as these countries have larger presence of automotive and aviation industries.

Primary nickel consumption in China has been growing up since 1990 and surpassed the major consumers. China is the world largest user of nickel followed by Japan and United States according to the report published by Price Warehouse Coopers in 2008. Asia accounts for 47% of the world's total primary nickel consumption followed by Europe 36% and America 14%.

Fig. 5: World Nickel Usage Trend (1987-2008)



Source: International Nickel Study Group

Global nickel consumption constantly increased till year 2006. World nickel demand increased by 3% per annum between 2002 and 2006. However, it declined sharply falling 9.5% from 2006 to 2008. World nickel consumption had dropped from 1.31 Mt in 2007 to 1.267 Mt in 2008. The decline in demand resulted in a global nickel surplus of around 50,000 tonnes in 2008. Nickel usage in Asia & Europe declined by 3.6% & 4.2% respectively in 2008. The dire demand environment has largely been the result of weak stainless demand.

A CUTTING EDGE PLATFORM

Worldwide Nickel Mines

- Norilsk Nickel: It is the global major in nickel mining, produced 295,209 tons of the metal in 2007, accounted for 22% of world's nickel production..
- Companhia Vale do Rio Doce (RIO) or Vale: It is a Brazilian mining giant, produced 247,900 tons of refined nickel in 2007.
- Colombia's Cerro Matoso ferronickel mine: This mine is owned by BHP Billiton, produces 55,000 tons of ferronickel annually (around 4 percent of world's nickel).
- Xstrata PLC: It is Anglo-Swiss miner. Its mined nickel production was up 1 percent to 52,108 tons in 2007 from 51,674 tons in 2006.
- Eramet SA: It is French nickel producer, produced 55,088 tons in 2007.

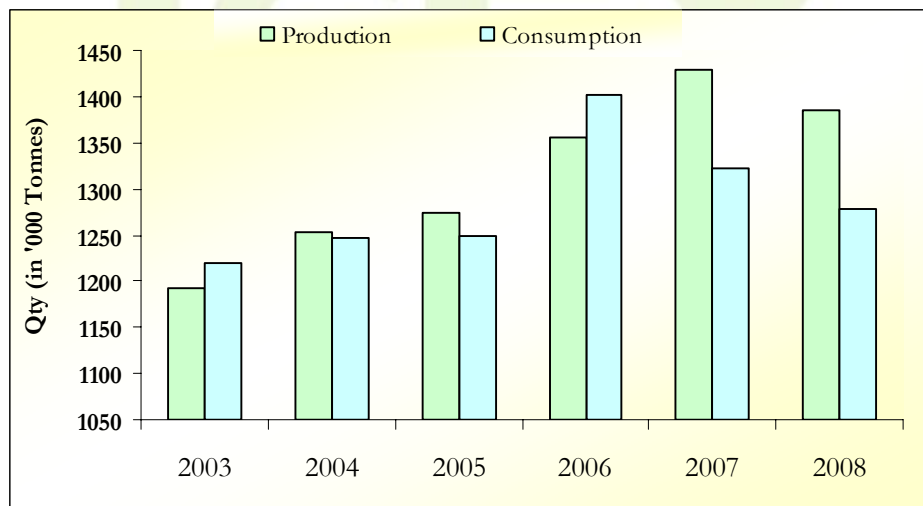
Domestic Scenario

India does not produce nickel, as there are no sulphide deposits in the country and mainly depends on imports for its consumption. The only source of producing the metals is with that of lateritic oxides, which is available in Sukhinda valley, in the state of Orissa. About 85% of India's imports are in the form of unwrought nickel. Russia is the main supplier of nickel to India and contributes nearly half of its imports, followed by Canada with 9% and Brazil with 7%.

Nickel Consumption in India

India's nickel consumption rose from 2,800 tonnes in 1974 to 16,600 tonnes in 2007. Nearly 67% of nickel output was used to make stainless steel in India. The majority of India's consumption is of low nickel content stainless steel, which uses 1% to 4% of the base metal.

Fig. 6: World Primary Nickel Production & Consumption



Source: International Nickel Study Group

Import of Nickel in India

India is totally dependent on nickel import. The country imports around 30,000 tonnes of nickel per annum. With increasing use and manufacture of stainless steel, nickel import is expected to increase in the coming years.

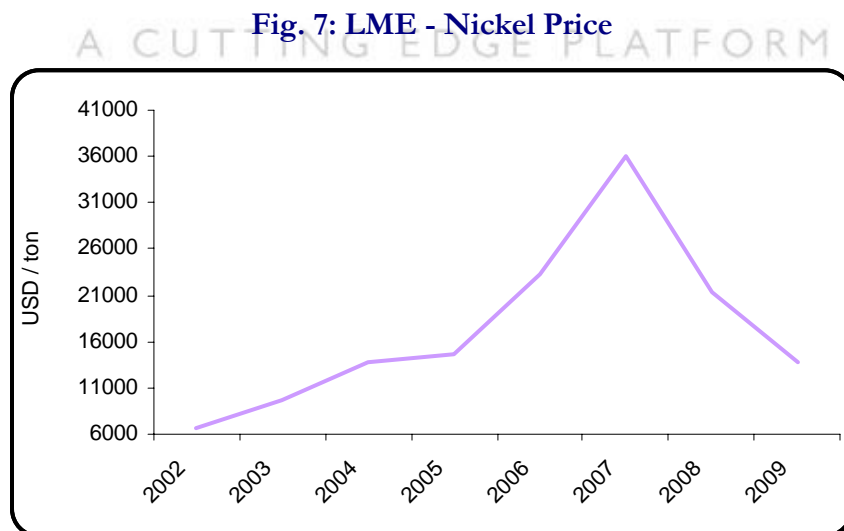
Nickel import is primarily regulated by the government. Import of ferro-alloy and nickel, key raw materials for production of stainless steel currently attracts 5% import duty.

Major Trading Centers of Nickel

The London Metals Exchange (LME) is the only major trading center that trades nickel. The primary nickel futures contract has been traded on the LME since 1979, and the exchange is the only major global centre for nickel consumers and producers to hedge their market risks. The LME Nickel contract, valued in Dollars, can be cleared in USD, sterling, yen or euro. Lot sizes are for 6 tons with a tolerance of +/-2%. This physical contract requires that the primary nickel be of purity not less than 99.80% with the chemical analysis conforming to the current ASTM specification.

Nickel Prices

Nickel prices (annual average) have ruled at significantly higher levels in the year 2007. Thereafter, prices have witnessed sharp decline due to subdued demand on global economic slowdown. Prices are witnessing recovery in recent months in 2009.



Source: London Metal Exchange

Note: Three months forward LME daily avg. prices and Jan to Sept Avg. prices for 2009

Factors influencing Nickel Prices

- World economic growth
- Growth in stainless steel demand
- Demand from emerging economies particularly China and India
- LME Nickel inventories
- Freight rates
- US Dollar movements against other major currencies such as EUR, GBP.
- Government regulation on imports and duties

References

- International Nickel Study group
- www.metalworld.co.in
- World Bureau of Metal and Statistics
- www.basemetals.com

