

# NICKEL

*By the International Nickel Study Group*

In 2002, the global economy grew by around 3%. Developing countries contributed substantially to this growth, with an average increase in GDP of around 4.5%. The advanced economies grew by a modest 1.8%, while the countries with economies in transition expanded GDP by around 4% on average.

Within the developing countries, China realised an impressive growth rate of 8%, compared with 7.3% in 2001. In the US, economic growth accelerated from 0.3% in 2001 to 2.4% in 2002. In both the European Union (EU) and Japan the growth slowed down further to 1% and 0.3% respectively. Growth in Korea accelerated to more than 6%, while the Taiwanese economy grew 3.5% in 2002 after a decline of more than 2% in 2001.

GDP growth provides an indication of general economic health, but it does not necessarily coincide with developments in the metals industry. A more important indicator for changes in metals demand is Industrial Production (IP). For most of the main economies, IP in 2002 remained subdued. In the US it declined by around 0.75%, although a gradual recovery occurred during the second half of the year. In the EU, production fell by around 1%, with almost all the large member states contributing to this decline, including Germany (-1.5%). The bright spot in 2002 was Southeast Asia, with Korea and Taiwan reporting increases in production of 7.5% and 7%, respectively. China was again one of the top performers with a growth rate of around 12.5%. Japan was one of the few countries in this region reporting a fall in IP (-1.5%).

Despite the sluggish economic development, world nickel demand improved by around 6.4% to slightly over 1,17 Mt in 2002, while global stainless steel production rose by more than 7%. The nickel industry increased refined nickel production by 1.7% to 1.18 Mt leaving the global nickel market in a small surplus. Primary nickel stocks at the LME and inventories held by nickel producers, together, remained almost stable at 110,000 t, which equals around five weeks of nickel use. (Table1)

## **Nickel demand**

Production of stainless steel is the main driver of nickel demand, with about 67% of the volume of nickel used annually. The momentum of world stainless-steel consumption is heavily dependent on the global economic situation. However, it has shown on average a long-term annual growth rate of almost 6% since the 1950s to reach over 20 Mt in 2002. This global picture hides significant diverging trends in regional markets as depicted by the figures provided in Table 2.

After the general decline in stainless-steel production in 2001, estimates for 2002 offer a more bullish picture, with a return to the production levels of 2000

and a year- on-year global growth rate of 7.2%. The rebound is particularly spectacular in the US, with an increase of almost 20%, but this development must rather be interpreted as the return to the average recent market level of around 2.2 Mt.

While Japan seems to maintain a stable profile on stainless steel, the other Asian producers are definitely showing a major industrial momentum, with an increase of almost 13% in 2002, significantly above the average. The trend is particularly impressive in China with a year-on-year growth rate between 30% and 40% over the past four years that enabled Chinese stainless-steel production to climb over the threshold of 1 Mt in 2002.

It is particularly interesting to compare those regional trends in world stainless-steel production with the primary nickel-consumption patterns during the same period, as outlined in Table 3.

Although Japan slightly reduced stainless steel production in 2002, its nickel use rose by almost 19% over the same period last year, indicating a strong recovery in the other nickel-consuming sectors, such as the nickel metal hybride batteries and nickel alloys manufacturing. This is contrary to what happened in 2001, thus showing how reactive the nickel markets can be. The reverse picture is given by the US, with a drop of more than 11% in nickel usage but a stainless-steel production increase of almost 20%. Stainless-steel scrap generated internally in the US enabled the gap to be bridged, the main explanation being the huge fall in high nickel-alloy usage (mainly jet engines and gas turbines). This is another illustration of the nickel markets' versatility.

The other regional markets (ie other Asia and Europe), mainly driven by stainless- steel production, showed consistent trends in volumes of nickel use, again sustained by Chinese consumption, which reached close to 100,000 t in 2002. In Europe, the availability of high-quality nickel units coming from the scrapping of old national coins as a consequence of the introduction of the euro should be mentioned, although the supply only started at the end of the year.

### **Mine production**

Nickel is mined from either sulphide or laterite ores, each providing almost equal shares for the current production of primary nickel. The main nickel sulphide deposits are located in Australia, Canada, Russia and South Africa, and are frequently associated with copper and platinum group metals (PGM) and often exploited as underground mines. On the contrary, laterite deposits are operated as open-pit mines, located principally in Western Australia, New Caledonia, Indonesia, Colombia, Cuba, Venezuela, Brazil and the Dominican Republic, enabling cobalt recovery as a by-product if not further processed to ferronickel.

The significant changes that occurred in 2002 took place in Colombia and Venezuela with the final stage of the production ramp up of the mining facilities recently developed there, whereas the mines located in Oceania recorded significant reductions in nickel output.

### **Primary refined production**

The year encountered a small production increase of about 1.7%, but still higher in quantity than demand. Production is fairly well distributed around the world.

In Africa, refined production remained marginally above the 50,000 t level in 2002, with South Africa contributing about 75% and Zimbabwe the remainder.

The Americas was the most successful area in terms of production, achieving over 290,000 t, an increase of close to 6% from the previous year. Brazil's output rose by about 5% to 24,000 t. Canada maintained its status as one of the world's largest producers and managed an increase of close to 3% to 145,000 t. The recent Colombian increase in capacity meant that production there increased by 15% to 44,000 t. Cuba is estimated to have maintained a level of over 40,000 t, but the production of intermediate feed for export increased. The Dominican Republic also improved output, by 9% to 24,000 t. Venezuela posted the largest percentage increase of 60% as a result of building up recently installed capacity.

Asian production increased by close to 4%, to over 220,000 t. China reached a new high of close to 54,000 t, up by over 8% from 2001. Production problems in Indonesia reduced the output of primary nickel marginally to 9,000 t, which was also the case for intermediate matte production for export. Japan continued to be the second- largest nickel manufacturing country, and increased production by over 3% to close to 160,000 t.

European production followed the world trend, with an increase of about 1.5%. Austria continued to produce about 1,500 t. Finland marginally expanded production to 55,000 t. France reduced production marginally to about 11,000 t. FYROM, or the Former Yugoslav Republic of Macedonia, had reactivated production in 2001 and substantially raised the output by over 70% during the year, to 5,000 t. Greek production also increased, by 9% to 19,000 t. In Norway, production was maintained at about 69,000 t, and the UK also maintained the previous year's level of 34,000 t.

Oceania managed an increase of 4% to 180,000 t. Australian producers continued to ramp up production, by over 3% to 132,000 t, even though Cawse had stopped production of refined products and is now producing an intermediate product for export. New Caledonia managed to improve output by 6% to 68,000 t.

The Commonwealth of Independent States (CIS) was the only area with a negative growth of close to 6%. Russia's estimated production was 240,000 t, down 5% from the previous year as a result of stoppages for refurbishment of different plants and equipment. In Ukraine it is believed that no production took place during the year due, *inter alia*, to equipment failure (Table 5).

### **Projects and expansions**

The year was characterised by continued problems, particularly in regard to the financing of new projects. Of the main known projects around the world,

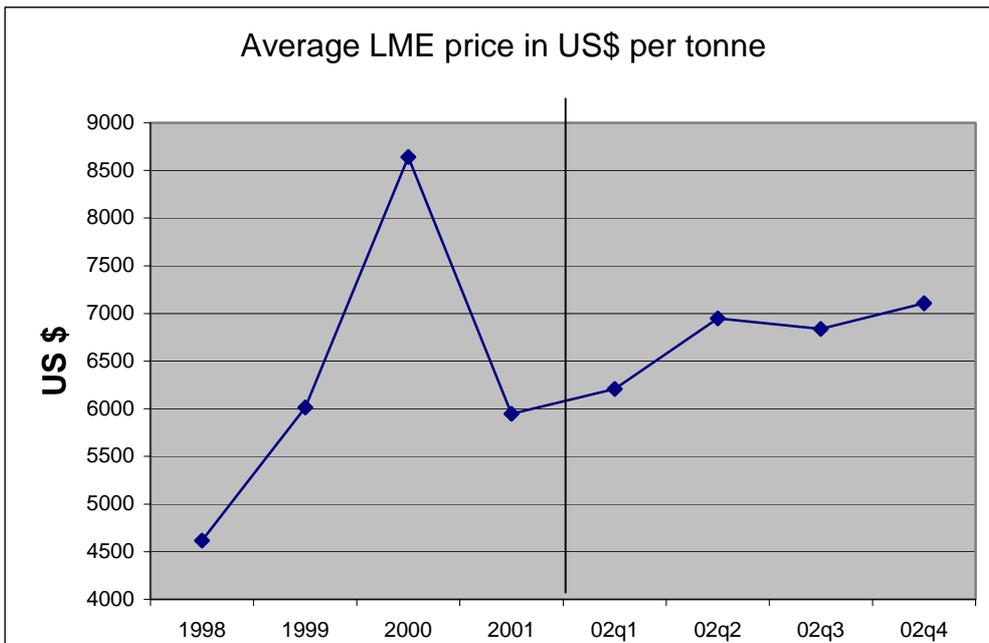
Canada's Voisey's Bay advanced beyond many peoples' expectations after a period of slow progress. There was much activity in Cuba, both in regard to mining as well as in refining, but no material changes in actual capacity took place. In Australia, many projects are being reviewed, including Ravensthorpe, but no major decisions were taken to go ahead with any of them. During the year, new projects were promoted in countries currently not producing nickel, such as Guatemala, Spain and Turkey. In South Africa, and to a lesser extent in Zimbabwe, PGM mining expansions continued, which also should result in increasing nickel production. In Botswana, mining capacity and production was increased at existing operations.

In New Caledonia, there are currently large expansions taking place in both mining and refining, but the Goro project encountered financial cost overruns and has been temporarily delayed. Further, in Indonesia there are plans to more than double the production of ferronickel. The Japanese have also stated plans to increase refined production, to be supported by a new intermediate production facility in the Philippines.

Although there were no Greenfield nickel-refining projects coming on stream during the year there were capacity expansions in China and Brazil. In Russia, the main producer is in the process of refurbishing its mines, smelters and refineries, which most likely would result in higher output compared with recent years, although nameplate capacity might remain the same.

### LME prices

The average LME settlement price for nickel in 2002 was US\$6,772/t, reflecting an uptrend over the year. The price rose from US\$6,047/t in January to US\$7,146/t in July. The price subsequently retreated to US\$6,644/t in September before staging a recovery to reach US\$7,197/t at year-end.



**Table 1: World Supply/Demand Balance for Refined Nickel ('000t)**

	1999	2000	2001	2002	2002/2001 in%
World Production	1,023.5	1,082.5	1,160.1	1,179.8	+ 1.7
World Demand	1,081.6	1,122.6	1,100.0	1,171.5	+ 6.4
<b>Market Balance</b>	<b>-58.1</b>	<b>-40.1</b>	<b>60.1</b>	<b>8.3</b>	
<b>Stocks at year-end:</b>					
Producers	83.8	87.5	91.4	89.1	
LME	47.0	9.7	19.2	22.0	

**Table 2: Stainless Steel Production ('000 t)**

	1999	2000	2001	2002 (estimate)	2002/2001 % change
Europe	7,430	7,960	7,690	8,110	+ 5.5%
Japan	3,380	3,840	3,850	3,830	- 0.5%
Asia others <sup>(1)</sup>	3,610	4,220	4,260	4,800	+ 12.7%
US	2,190	2,180	1,820	2,180	+ 19.8%
Others	1,280	1,230	1,050	1,100	+ 4.8%
<b>Total</b>	<b>17,890</b>	<b>19,430</b>	<b>18,670</b>	<b>20,020</b>	<b>+ 7.2%</b>

<sup>(1)</sup> China, South Korea, India, Taiwan

**Table 3: Primary Nickel Use ('000 t)**

	1999	2000	2001	2002 (estimate)	2002/2001 1 in%
Europe	390	400	420	435	+ 3.6%
Japan	185	200	160	190	+ 18.8%
Asia others <sup>(1)</sup>	235	250	265	295	+ 11.3%
US	150	150	130	115	- 11.5%
Others	120	120	125	135	+ 8%
<b>Total</b>	<b>1,080</b>	<b>1,120</b>	<b>1,100</b>	<b>1,170</b>	<b>+ 6.4%</b>

<sup>(1)</sup> China, India, South Korea, Taiwan

**Table 4: Nickel Mine Production ('000 t)**

	1999	2000	2001	2002	2002/2001 % change
<b>Africa</b>	<b>73.1</b>	<b>69.3</b>	<b>67.7</b>	<b>68.8</b>	<b>+ 1.7%</b>
Botswana	25.8	24.4	23.9	22.6	- 5.4%
South Africa	36.2	36.6	36.4	38.5	+5.8%
Zimbabwe	11.1	8.3	7.4	7.8	+ 4.8%
<b>America</b>	<b>349.5</b>	<b>386.9</b>	<b>391.3</b>	<b>398.6</b>	<b>+ 1.9%</b>
Brazil	32.5	35.6	34.2	36.0	+ 5.3%
Canada	186.2	190.7	194.1	188.1	- 3.1%
Cuba	67.0	71.4	76.5	77.3	+ 1.0%
Colombia	39.3	58.9	53.0	58.2	+ 9,9%
Dom.Rep.	24.5	27.8	22.3	23.5	+ 5.2%
Venezuela	--	2.5	11.4	15.5	+ 35.8%
<b>Asia</b>	<b>151.6</b>	<b>169.4</b>	<b>176.7</b>	<b>174.8</b>	<b>- 1.1%</b>
China	50.1	51.0	51.5	54.8	+ 6.4%
Indonesia	89.1	98.2	102.1	95.6	- 6.4%
Philippines	12.4	20.2	23.1	24.1	+ 4.5%
<b>Europe</b>	<b>19.7</b>	<b>25.2</b>	<b>26.3</b>	<b>26.9</b>	<b>+ 2.3%</b>
Greece	16.1	19.5	20.8	22.7	+ 9.1%
<b>Oceania</b>	<b>229.3</b>	<b>284.0</b>	<b>322.7</b>	<b>287.6</b>	<b>- 10.9%</b>
Australia	119.2	166.4	205.1	188.7	- 8.0%
New Caledonia (Fr.)	110.1	117.6	117.6	99.0	- 15.8%
<b>Russia</b>	<b>235.0</b>	<b>235.0</b>	<b>235.0</b>	<b>235.0</b>	<b>0.0%</b>
<b>Others</b>	<b>--</b>	<b>3.6</b>	<b>4.5</b>	<b>5.2</b>	<b>+ 15.6%</b>
<b>Total</b>	<b>1,058.1</b>	<b>1,173.5</b>	<b>1,224.3</b>	<b>1,198.6</b>	<b>- 2.1%</b>

**Table 5: Primary Refined Nickel Production ('000 t)**

	2000	2001	2002	2002/2001 % change
<b>Africa</b>	<b>50.2</b>	<b>52.9</b>	<b>51.4</b>	<b>-2.8%</b>
South Africa	36.6	33.4	38.5	15.3%
Zimbabwe	13.6	19.5	12.9	-33.9%
<b>America</b>	<b>213.0</b>	<b>232.9</b>	<b>251.2</b>	<b>7.9%</b>
Brazil	23.2	22.5	23.7	5.3%
Canada	134.2	140.6	144.5	2.8%
Colombia	27.7	38.4	44.0	14.4%
Dominican Republic	27.8	21.7	23.6	8.7%
US	0.0	0.0	0.0	n.a.
Venezuela	0.0	9.7	15.5	59.8%
<b>Asia</b>	<b>170.8</b>	<b>164.0</b>	<b>167.8</b>	<b>2.3%</b>
Indonesia	10.1	10.3	8.9	-13.2%
Japan	160.7	153.7	158.9	3.4%
<b>Europe</b>	<b>182.0</b>	<b>188.8</b>	<b>189.9</b>	<b>0.5%</b>
European Union	123.4	120.6	121.3	0.6%
Austria	1.3	1.5	1.5	0.0%
Finland	54.3	54.6	55.3	1.4%
France	12.3	13.0	11.4	-12.2%
Greece	17.5	17.7	19.2	8.8%
UK	38.0	33.8	33.8	-0.1%
Norway	58.7	68.2	68.5	0.5%
<b>Oceania</b>	<b>154.5</b>	<b>174.0</b>	<b>181.0</b>	<b>4.0%</b>
Australia	110.5	128.1	132.3	3.3%
New Caledonia (France)	43.9	45.9	48.7	6.0%
<b>East</b>	<b>311.9</b>	<b>347.4</b>	<b>338.6</b>	<b>-2.6%</b>
China, P.R.	50.9	49.5	53.6	8.3%
Cuba	40.0	41.2	40.5	-1.8%
FYROM	0.0	3.0	5.2	72.0%
Russian Federation	221.0	252.2	239.3	-5.1%
Serbia	0.0	0.0	0.0	0.0%
Ukraine	0.0	1.5	0.0	-99.2%
<b>World Total</b>	<b>1,082.5</b>	<b>1,160.1</b>	<b>1,179.8</b>	<b>1.7%</b>

The **International Nickel Study Group (INSG)** is an intergovernmental organization aimed at improving the nickel world market transparency and strengthening the international cooperation on nickel related issues. The INSG Secretariat is based in The Hague, The Netherlands, since the establishment of the Study Group in 1990, and currently comprises 14 Members.

### **SCOPE OF ACTIVITIES:**

- Collect, process and publish **improved statistics** on nickel markets;
- Compile and publish other information on nickel, such as **data on industry facilities and environmental, health and safety issues**;
- Provide a **forum for consultations** on issues of interest to nickel producing and consuming countries and their industries;
- Undertake **economic analysis** of nickel markets and related topics.

### **WORLD NICKEL STATISTICS AND NICKEL MARKET FORECAST:**

The INSG statistical bulletin provides a monthly release of the main nickel statistical parameters per country:

- Mine and **primary nickel** production, trade, stocks and consumption;
- Trade in **nickel bearing and stainless steel scrap**;
- **Nickel content** of the products referred to above;
- Processing of some world **stainless steel melt production data**.

Twice a year, the INSG Secretariat prepares a **short-term world market balance**, which contributes to enhancing the world market transparency.