NICKEL

(Data in metric tons of nickel content unless otherwise noted)

Domestic Production and Use: The United States did not have any active nickel mines in 2005. Limited amounts of byproduct nickel, though, were recovered from copper and palladium-platinum ores mined in the Western United States. On a monthly or annual basis, 200 facilities reported nickel consumption. The principal consuming State was Pennsylvania, followed by Kentucky, West Virginia, and Indiana. Approximately 45% of the primary nickel consumed went into nonferrous alloy and superalloy production, 36% into stainless and alloy steels, 14% into electroplating, and 5% into other uses. End uses were as follows: transportation, 33%; chemical industry, 13%; electrical equipment, 11%; construction, 9%; fabricated metal products, 7%; household appliances, 6%; machinery, 6%; petroleum industry, 6%; and other, 9%. Estimated value of apparent primary consumption was $1.98 billion.

Salient Statistics—United States:[1]	2001	2002	2003	2004	2005[e]
Production, refinery byproduct	W	W	W	W	W
Shipments of purchased scrap[2]	121,000	114,000	119,000	113,000	121,000
Imports: Primary	136,000	121,000	125,000	136,000	148,000
Secondary	8,760	9,110	11,500	18,800	16,500
Exports: Primary	8,450	6,520	6,330	8,000	10,900
Secondary	48,600	39,400	47,300	48,300	51,900
Consumption: Reported, primary	98,800	88,200	87,400	98,800	105,000
Reported, secondary	81,200	83,900	83,500	83,300	85,200
Apparent, primary	129,000	121,000	117,000	129,000	136,000
Total[3]	210,000	205,000	200,000	212,000	221,000
Price, average annual, London Metal Exchange:					
Cash, dollars per metric ton	5,945	6,772	9,629	13,823	14,538
Cash, dollars per pound	2.696	3.072	4.368	6.270	6.594
Stocks: Consumer, yearend	12,500	11,600	10,900	10,600	11,500
Producer, yearend[4]	12,600	6,150	8,040	6,580	7,310
Net import reliance[5] as a percentage of apparent consumption	52	52	50	55	54

Recycling: About 85,200 tons of nickel was recovered from purchased scrap in 2005. This represented about 39% of reported secondary plus apparent primary consumption for the year.

Import Sources (2001-04): Canada, 41%; Russia, 14%; Norway, 11%; Australia, 9%; and other, 25%.

Tariff: Item	Number	Normal Trade Relations 12-31-05
Nickel oxide, chemical grade	2825.40.0000	Free.
Ferronickel	7202.60.0000	Free.
Nickel oxide, metallurgical grade	7501.20.0000	Free.
Unwrought nickel, not alloyed	7502.10.0000	Free.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: The U.S. Government sold the last of the nickel in the National Defense Stockpile in 1999. The U.S. Department of Energy is holding 9,400 tons of nickel ingot contaminated by low-level radioactivity plus 6,000 tons of contaminated shredded nickel scrap. Planned decommissioning activities at former nuclear defense sites are expected to generate an additional 20,000 tons of shredded scrap.

Events, Trends, and Issues: Stainless steel accounts for two-thirds of the world primary nickel use. U.S. production of austenitic (nickel-bearing) stainless steel reached a record high of 1.60 million tons in 2005—3% more than the previous record of 1.55 million tons set in 2004. World nickel mine production was at an alltime high in 2005. Since 1950, stainless steel production in the Western World has been growing at an average rate of 6.0% per year. Demand for stainless steel in China has been particularly robust since 2000 and exceeded that of Germany in 2005. Chinese and Australian companies have teamed up to explore for nickel in China. China imported nickel from Cuba and a new mine in Spain to help supply its growing stainless steel-producing industry. Nickel prices reached their highest level since 1989 ($16,920 per metric ton) by mid-2005. For the week ending November 25, 2005, the London Metal Exchange cash price for 99.8% pure nickel averaged $12,636 per metric ton ($5.73 per pound). High prices have encouraged substitution of lower nickel-containing grades of stainless for higher grades in some applications. For example, type 201 (3.5% to 5.5% nickel) was being substituted for type 304 (8.0% to 10.5% nickel).

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Some nickel consumers were concerned that global demand for the metal would outstrip supply before several new mining projects could be completed. A major Canadian-based producer began shipping concentrate from its new Voisey's Bay Mine in northeastern Labrador. The Canadian-based company was also constructing a laterite mining complex at Goro near the southeastern tip of New Caledonia. The New Caledonian nickel was to be recovered onsite using advanced pressure acid leach (PAL) technology. The same company proposed the friendly takeover of Canada's second largest nickel producer. Regulatory authorities in Canada, the European Union, and the United States were evaluating the proposed takeover from an antitrust viewpoint. Australia's leading nickel producer was developing a large laterite deposit near Ravensthorpe, Western Australia. The concentrate from Ravensthorpe was to be shipped to Yabulu in Queensland for refining. Several other companies were considering employing some form of acid leach technology to recover nickel at greenfield sites in Cuba, Indonesia, Kazakhstan, and the Philippines. A new type of heap-leaching process was being used to recover nickel in Turkey. At least five automobile manufacturers planned to use nickel-metal hydride (NiMH) batteries to power their gasoline-electric hybrid vehicles for the 2007 and 2008 model years. Demand for gasoline-electric hybrid vehicles has been gradually building in the United States since their introduction in late 1999 and has dramatically accelerated with the sharp increases in gasoline prices in 2005. At least 14 light-duty models were being offered in North America—8 of Japanese design. A leading NiMH battery manufacturer was producing battery modules at a new facility in Springboro, OH. Modules were being manufactured for a variety of applications in addition to the transportation market, including stationary backup or uninterruptible power supply systems for telecommunications.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[6]	Reserve base[6]
	2004	2005[e]		
United States	—	—	—	—
Australia	178,000	210,000	22,000,000	27,000,000
Botswana	33,000	37,100	490,000	920,000
Brazil	45,200	46,000	4,500,000	8,300,000
Canada	187,000	196,000	4,900,000	15,000,000
China	64,000	71,000	1,100,000	7,600,000
Colombia	75,000	72,500	830,000	1,100,000
Cuba	72,400	75,000	5,600,000	23,000,000
Dominican Republic	47,000	47,000	720,000	1,000,000
Greece	21,700	22,100	490,000	900,000
Indonesia	133,000	140,000	3,200,000	13,000,000
New Caledonia[7]	118,000	122,000	4,400,000	12,000,000
Philippines	17,000	22,000	940,000	5,200,000
Russia	315,000	315,000	6,600,000	9,200,000
South Africa	39,900	41,700	3,700,000	12,000,000
Venezuela	20,500	22,000	560,000	630,000
Zimbabwe	9,520	9,800	15,000	260,000
Other countries	11,000	26,000	2,100,000	5,900,000
World total (rounded)	1,400,000	1,500,000	62,000,000	140,000,000

World Resources: Identified land-based resources averaging 1% nickel or greater contain at least 130 million tons of nickel. About 60% is in laterites and 40% in sulfide deposits. In addition, extensive deep-sea resources of nickel are in manganese crusts and nodules covering large areas of the ocean floor, particularly in the Pacific Ocean.

Substitutes: With few exceptions, substitutes for nickel would result in increased cost or a tradeoff in the performance of the product. Aluminum, coated steels, and plastics can replace stainless steel to a limited extent in many construction and transportation applications. Nickel-free specialty steels are sometimes used in place of stainless steel within the power generating, petrochemical, and petroleum industries. Titanium alloys or specialty plastics can substitute for nickel metal or nickel-base alloys in highly corrosive chemical environments. Recent cost savings in manufacturing lithium ion batteries allow them to compete against NiMH in certain applications.

[e]Estimated. W Withheld to avoid disclosing company proprietary data. — Zero.

[1]Changes in this section are due to revisions of 2001-03 ferrous scrap data.

[2]Scrap receipts – shipments by consumers + exports – imports + adjustments for consumer stock changes.

[3]Apparent primary consumption + reported secondary consumption.

[4]Stocks of producers, agents, and dealers held only in the United States.

[5]Defined as imports – exports + adjustments for Government and industry stock changes.

[6]See Appendix C for definitions.

[7]Overseas territory of France.