

## THE UNITED STATES

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The year 2002 saw a good deal of advancement in the mining industry agenda. The industry was in the forefront of the legislative and regulatory debate across a wide range of issues. The energy agenda was advanced through continuing focus on a comprehensive energy policy, and although House and Senate passed legislation was not completed before the end of the year, the stage was set for action in 2003. On the metals side, the industry was able to advance the idea that a National Minerals Policy is just as needed as a National Energy Policy. The US is one of the world's richest minerals nations, there is strong public support for greater use of domestically mined minerals, and a policy that encourages investment and development of US resources and production, while assuring environmental protection, must be developed in the years to come.

The US economy, as measured by current dollar GDP, was US\$10,446.2 billion in 2002, 3.5% higher than in 2001. The rate of growth was mixed all year with a 6.5% annual growth rate in the first quarter and a 5.1% increase in the third quarter but only a 2.5 and 3.2% increase in quarters two and four respectively. Domestic production of almost all metals and minerals declined in 2002 with the sharpest decline in the production of copper, zinc and lead. Steel production was up, but continued to face strong competition from non-US sources. As measured by value, the demand for minerals and mineral products was just slightly below 2001 at an estimated US\$373 billion (See Table 1). The total value of non-fuel raw minerals fell by 2.6% in 2002 to US\$38.0 billion. The value of metals, an estimated US\$8 billion, continued a near decade long decline. This was 6.7% lower than in 2001. The value of non-metals was up, but only by 0.3% over 2001 to US\$30.0 billion (Note that all 2001 data have been revised).

The estimated value of coal, crude oil and natural gas production was US\$125.4 billion, 15.7% below 2001 levels, a change more reflective of sharp changes in the price of natural gas than in the change in US production of fuels, although production of all fuels did decline in 2002: coal was down 3.0%, natural gas production was down 3.2% and crude oil production declined by just under 1%. The value of coal and crude was slightly greater in 2002, but the value of natural gas declined by 26.6%. The well head price for natural gas which reached record highs during the first part of 2001 had declined to more normal levels and remained there throughout 2002.

Employment in coal mining declined to an average 79,700 workers in 2002 as compared with 79,900 in 2001. Employment in metal mining declined to an average 32,200 (35,600 in 2001) and employment in non-metals declined to an average 110,800 workers (111,000). The Mine Safety and Health

Administration (MSHA) reported that mine fatalities declined to 67 in 2002: 27 in coal and 40 in other mines.

The producer price indices (PPI) most closely associated with mineral products were mixed in 2002 (1982=100). The PPI for metals and metal products increased by 0.4% to 125.9 owing to a very small increase in the prices of some metals. The PPI for non-metallic mineral products increased by 1.9% to 146.2. The PPI for fuels and related products and power declined 11% going from 105.3 in 2001 to 93.2 in 2002. The decline was a result of the aforementioned decline in the price of natural gas.

The US trade deficit in goods and services continued to climb in 2002 reaching US\$435.7 billion. Imports of consumer goods, capital goods and services were higher and the value of exports continued to decline. Imports of petroleum and petroleum products declined for the first time in nearly a decade totalling 4,208 million barrels in 2002. Because the average price for crude and product increased slightly in 2002, the estimated value of these imports was US\$103.9 billion just slightly higher than in 2001. The value of exports of petroleum and petroleum products was an estimated US\$10.3 billion. The value of coal exported totalled US\$1.4 billion, lower than in 2001 due to the 23% drop in US coal exports.

Total US trade (exports and imports) in raw minerals and processed material of mineral origin was valued at US\$101 billion in 2002. Imports of processed mineral material were valued at US\$62 billion, while exports were an estimated US\$39 billion for a mineral trade deficit of US\$23 billion, the same as in 2001. The most important sources of non-fuel mineral materials and import dependence for several commodities are listed in Table 2.

### **Issues in 2002**

The mining industry had the same top priorities in 2002 as in 2001. The industry worked for a National Energy Policy that recognises the importance of coal to the US economy and a National Minerals Policy that both promotes the importance of mining metals and minerals within the US and results in responsible reform of the nation's mining law and other policies that affect mining. An energy policy to support coal, and thus affordable and reliable electricity, encompasses support for research and then development and commercialisation of the clean-coal technologies that will promote greater use of coal while generating electricity more efficiently and with lower emissions. Clean-coal is supported by the Bush Administration as reflected in the 2001 National Energy Policy, in the Administration's budget requests and in support for coal based hydrogen production. Clean coal technologies are also supported in the Congress as reflected in provision of The Comprehensive Energy Bill that passed the House of Representatives in 2001 and the Senate in 2002. As pointed out this Bill, which included investment and tax credits to move these advanced technologies to the commercial market as well as authorisation for additional research, failed to become law when the Congressional Conference Committee could not resolve differences between the House and Senate version before adjournment in late 2003. Energy legislation, with the same clean-coal technology provisions, passed both the

House and Senate again in 2003 and is once more in conference with final passage expected in mid to late autumn.

Climate change is included under the energy policy umbrella. In March 2001, President Bush announced that the US would not be a party to the Kyoto Protocol. Instead, the President announced that the US would embark on a long term effort to reduce emissions that include additional research, technology development and voluntary industry actions. During 2002, the Administration advanced the Climate Science and Technology Programme, began developing a long-term climate change research strategy, negotiated several bilateral and multilateral climate agreements, began work on the International Carbon Sequestration Leadership Forum and challenged business to meet a voluntary emissions intensity reduction goal. In response to the President's challenge to the business community, the mining industry has developed the Mining Industry Climate Action plan. Details are found on the National Mining Association web site: [www.nma.org](http://www.nma.org)

Air issues are also closely related to energy policy. The Administration announced a multi-emissions proposal to amend our Clean Air Act by replacing several existing regulations on utilities with new SO<sub>2</sub>, NO<sub>x</sub> and mercury reduction requirements. The mining industry supports this effort. Debate on the legislation needed to amend the Clean Air Act continued into 2003.

On the mining side, and following a favourable Administration decision on Section 3809 regulations governing hardrock mining on federal lands, the industry began the quest for a 'National Minerals Policy' in earnest. Although the US has a number of advantages that encourage development of resources – including a relatively strong market and government stability – there are a number of issues that must be addressed before widespread development of mineral resources can once again occur. The issues that must be addressed include the complexity of our environmental regulations, the uncertainties still surrounding decisions of the Clinton Administration, including the millsites opinion, and the time delays and excessive permitting costs that are experienced when trying to develop new resources. A National Minerals Policy that addressed these issues, including responsible reform of the Mining Law, would assist in encouraging mineral resource development.

Sustainable development and the mining industry continues as an area in which the industry must be involved. As a response to international activities, including the 2002 World Summit on Sustainable Development, mining companies that are members of the National Mining Association unanimously adopted a sustainable development principles statement in September 2002. This statement focuses on activities within the US.

### **Energy<sup>1</sup>**

The US consumed 97.590 quadrillion Btu (quads) of energy in 2002, 1.2% more than in 2001. Energy use increased in all sectors of the economy, with

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<sup>1</sup> All 2001 energy data have been revised by the DOE's Energy Information Administration.

the largest increase occurring in the residential sector. Energy use for each dollar of economic activity (GDP) continued to decline and in 2002 was 10,340 Btu/dollar of GDP, 1.1% lower than in 2001. The 2002 market shares for the various sources of energy were as follows: 39.4% petroleum, 23.6% natural gas, 22.7% coal, 8.3% nuclear, 2.7% hydroelectric and 3.3% from geothermal, wind, biomass, solar and other renewable sources. Domestic production of energy supplied 70.8 quads and net imports added another 25.7 quads. Changes in stocks of fossil fuels accounted for the 1 quad difference between consumption, production and net imports.

According to preliminary data, domestic production of crude oil continued its decade long decline although the decline was less than 1%. Revised data show that imports of crude oil and petroleum products declined by 2% to 3,336 Mbbl. This is the first year-on-year decline since the mid-80s. At year-end, 599 Mbbl. were stored in the Strategic Petroleum Reserve. Natural gas production, on a dry basis, totalled 19,047 billion ft<sup>3</sup>, 3.6 % lower than in 2001. Net imports of natural gas also declined, totalling 3,604 billion ft<sup>3</sup>, 3.1% lower than in 2001. Consumption was higher in 2002, the difference coming from a draw down of gas in storage. Approximately 94% of US natural gas imports are from Canada.

Coal production declined by 3.0% in 2002, totalling 992.3 Mt and worth an estimated value of US\$19.3 billion. About 66% of this production came from surface mines and 34% came from underground mines. Western production (primarily from the Powder River Basin in Wyoming and Montana) accounted for 53% of US coal production. There are approximately 1,500 coal mines in the US. The number of mines is declining, but the average size of a mine has nearly doubled over the past decade.

Coal production levels declined in the Appalachian and Interior states, reflecting relative stagnation in demand for steam coal from those two producing areas, coupled with a continued decline in demand for coal for steel mills and for export. Production in the western states increased by only 0.5%. The only major coal producing states to experience an increase in production in 2002 were Wyoming, North Dakota and Texas. The states possessing the largest coal production are Wyoming, with 338.8 Mt, and West Virginia, with 136.6 Mt. Estimated productivity in 2002 was unchanged from 2001, at 6.2 t/h.

Domestic coal consumption in 2002 reached an estimated 966.9 Mt. This was higher than in 2001 but still lower than the record consumption of 2000. Use of coal by steel mills and by electric generators is still at lower levels than in 2000. The slight decline in the use of coal for electric generation reflects an increase in the use of natural gas in newly-built, gas-fired boilers. 910.3 Mt was used to generate electricity by electric utilities and by combined heat and power facilities (approximately 50% of the US 2002 electrical production was from coal). The industrial sector consumed another 33.5 Mt and 20.4 Mt was used for coking. Together, the commercial and retail sectors consumed 2.6 Mt. Coal stockpiles, which had been rebuilt to more normal levels in 2001 remained relatively unchanged.

The US exported 36.42 Mt of coal in 2002, continuing a decline that began in 1995. Shipments to all regions again declined but the sharpest drop was in exports to Europe. In particular, exports of metallurgical coal to both Japan and South Korea were zero and metallurgical coal shipments to Brazil dropped by 22%. Steam coal exports to all regions continued to decline, and in 2002, 60% of the steam coal exported went to Canada. Coal imports, primarily from Colombia, Venezuela, and Indonesia in the form of low-sulphur steam coal for utilities in Florida declined from the all-time high reached in 2001 but were still 14.1 Mt.

### **Iron, steel and ferro-alloys**

Raw steel production in 2002 was 92.2 Mt, 2.3% above production in 2001. Raw steel is produced either in basic oxygen furnaces in integrated mills, or in electric arc furnaces in minimills. Steel production in basic oxygen furnaces continued to decline in 2002 to 49.2% of the total. This is the first time that production in basic oxygen furnaces has been below 50% of production. Electric arc furnace production was 50.8% of the total. Continuous casting accounted for 97% of processed steel production. Capacity utilisation increased by 10% in 2002 and averaged 89.4%. The US had approximately 10.4% of worldwide production in 2002.

Although better than in 2001, the steel industry still experienced problems in 2002. Demand for steel did not increase appreciably and prices did not rebound as hoped. In the spring of 2001, at the request of the steel industry, the US Department of Commerce agreed to an investigation of alleged dumping of steel into the US market. In March 2002, a decision was made to impose tariffs on imports of a large number of steel products from a selected set of countries. The Administration continues to support reduction of excess steel capacity on a global basis. The steel industry will continue to rebuff attempts through the WTO or other means to reduce or remove the tariffs imposed in early 2001.

Steel mill products shipped totalled 90.0 Mt in 2002, down slightly from 2001. Carbon products made up the bulk of the shipments. Alloy and stainless shipments totalled 4.3 Mt and 1.7 Mt respectively. Despite the trade agreements, imports of steel mill products increased by 8.7% to total 29.6 Mt. Apparent consumption of steel was 107 Mt.

Reported consumption of iron and steel scrap was 72 Mt just 1 Mt more than in 2001 (Table 5). The US remained a net exporter of scrap in 2002. The total value of purchased scrap and exports was US\$5.7 billion, up 30% from 2001. This reflected a 15% increase in the average prices for scrap. Iron and steel slag used or sold in 2002 was 19 Mt valued at about US\$165 million.

In 2002, 11 mines, eight concentrating plants and eight pelletising plants shipped 51.5 Mt of usable iron ore worth US\$1.2 billion to customers in the US and abroad. Although higher than in 2001, shipments of iron ore were still below levels of the late 1990s. The number of mines operating declined in 2002 a reaction to the state of the US steel industry. Although several members of Congress asked the US Department of Commerce to initiate an



investigation to determine if imports of steel and iron ore constituted a threat to national security the case was closed in early 2002 with a non-threat finding.

There was no domestic production of chromium, manganese, nickel, cobalt or tungsten. Small amounts of vanadium were mined in 2001, but information about production is not available. US molybdenum production declined for the fifth consecutive year to 32,600 t valued at US\$270 million (based on average oxide prices). US production accounted for 25% of estimated worldwide production in 2002. The decline in US production was directly correlated to lower demand from the iron and steel industry which accounts for 70% of the molybdenum consumed in the US. Molybdenum exports were 23,100 t. Based on contained metal, net imports of chromium totalled 164,000 t, manganese 944,000 t, cobalt 7,300 t, primary and secondary nickel 80,720 t, tungsten 7,310 t and vanadium 1,940t.

### **Light metals**

**Aluminum.** Primary production totalled 2.7 Mt, with an estimated value of US\$3.9 billion, roughly 10.6% of worldwide production. Aluminum production in the US was down sharply in 2001 owing to production cutbacks caused by higher energy prices and reduced energy supplies in the Pacific Northwest. Production remained flat in 2002. Six smelters remained idled. In 2002, 1.2 Mt was recovered from old scrap. The US imported 4.0 Mt, which was partially offset by 1.5 Mt of exports. Consumption of aluminum increased by only 2.7% to 6.4 Mt. Transportation accounted for 34%, packaging 25%, building 17%, electrical 7%, consumer durables 7% and 10% went for other uses. Only one company mines small quantities of bauxite for non-metallurgical uses, thus US primary aluminum production came entirely from the 8.5 Mt of imported bauxite (of which 95% went to the production of alumina) and the 3.0 Mt net imports of alumina.

**Magnesium.** The producer of primary magnesium metal in the state of Washington closed in 2001 leaving only one company in Utah which recovers magnesium metal from brines from the Great Salt Lake. The company plans to review the feasibility of an increase in capacity to 80,000 t/y in the near future. Even if this addition is made, total production capacity would still be only half of that at the end of 1998. As there is now only one producer, neither actual production amounts nor value is available from published sources. Recovery of old scrap supplied 27,000 t of magnesium metal and net imports totalled 63,000 t. As a result of trade actions, countervailing duties on imports of magnesium were imposed in 2000 and these remained in effect into 2002. Apparent consumption was 120,000 t, 46% in aluminum-based alloys, 32% in castings and wrought magnesium products, 13% was used for desulphurisation of iron and steel, 2% for reducing agents in nonferrous metals production and 7% for other magnesium-containing products. US demand for magnesium castings for cars continued to increase and, due to limited production capacity, imports are likely to increase in tandem.

**Titanium.** Only two firms produce titanium sponge metal in the US, in Nevada and Utah, and thus mine production and primary metal production is not

available. Most titanium is consumed as titanium dioxide (TiO<sub>2</sub>) pigment. Four companies produced 1.38 Mt of TiO<sub>2</sub> pigment in 2002 valued at US\$2.7 billion. Imports of sponge metal were 12,600 t and exports were 2,000 t. TiO<sub>2</sub> exports were 470,000 t. Consumption of sponge metal declined in 2002 to 19,000 t due to lower demand from commercial aircraft manufacturers that use approximately 65% of the sponge metal used in the US. The remainder is used in the chemical process industry, and in the power generation, marine, ordnance, medical and other non aerospace industries. TiO<sub>2</sub> consumption was 1.16 Mt, 49% in paints, varnishes and lacquers, 25% in plastics and 26% in ceramics, coated fabrics, printing ink, paper and other uses.

### **Non-ferrous Metals**

**Copper.** Production declined for the sixth consecutive year in 2002, totalling 1.13 Mt, 15.6% below 2001 levels. The value of production was an estimated US\$1.9 billion. US production represented 8.4% of worldwide output in 2002. Refined copper production also declined in 2002 to 1.45 Mt. Old scrap provided 250,000 t, with net imports (ores and concentrates, refined and unmanufactured) totalling 1.7 Mt. Apparent consumption was 2.5 Mt – 44% in building construction, 25% electric and electronic products, 10% in industrial machinery and equipment, 11% transportation equipment and 10% consumer and general products. Domestic demand for refined copper continued to fall. Average copper prices, which had strengthened in 2000, declined in both 2001 and 2002.

The production cut backs begun in the US in 2001 continued into 2002. All companies still operating in the US, Asarco, Phelps Dodge and Kennecott Utah Copper reduced production levels. Negotiations on the US Chile Free Trade agreement were nearly concluded in 2002, with the US copper industry supporting a four-year continuation of tariffs for copper cathode from Chile. A compromise resulted in these tariffs being phased out in two years.

**Lead.** Mine output in 2002 was 440,000 t 3.1% lower than in 2001. Mine output had a value of approximately US\$415 million. US output represented approximately 15% of worldwide production. Old scrap provided over 1.1 Mt. The US was a net exporter of lead, net exports were 115,000 t. Apparent consumption was 1.6 Mt with 76% used in batteries, fuel tanks, solder, seals and bearings and 22% used in electrical, electronic, communications, ammunition, television glass, construction, and protective coatings and the remaining 2% was used in weights, crystal glass, tubes and containers, type metal, foil, wire and specialised chemicals. Demand for automotive (replacement batteries) was lower again in 2002 due to lack of temperature extremes in most regions. Demand for new car batteries was lower and demand for batteries for use in the telecommunications and computer industries remained low.

**Zinc.** Twelve mines produced 754,000 t valued at about US\$660 million in 2002. This was approximately 8.3% of estimated worldwide production. Old scrap provided 70,000 t and net imports reached 269,000 t. The trade data are affected because production in Alaska is processed in Canada and then shipped to the US for use thus counting both as an export and an import.

Consumption of all forms was 1.5 Mt with 55% used in galvanising, 17% in zinc-based alloys, 13% in brass and bronze, and 15% going for other uses. Over the past two years, four underground mines have been permanently closed and three have been put on a stand-by basis.

**Tin.** While there was no domestic production of primary tin, 6,500 t were recovered from old scrap and 12,000 t came from the government stockpile. Net imports were 33,500 t. The US consumed 37,000 t of primary tin, with 27% in cans and containers, 23% electrical 10% in both transportation and construction, and 30% in other uses.

### **Precious metals**

**Gold.** Mine production was 286 t, nearly 15% below production in 2001. Production was valued at US\$3.1 billion. US production was approximately 11.0% of worldwide production. Exports of refined gold, based on revised data, were 165 t in 2002. Domestic output continued to be centered in Nevada, California and Alaska with 80% of 2002 mine production located in those states. Between July 2001 and June 2002, four gold mines were closed. There were no new mines opened in this time frame. Mergers and acquisitions continued, as did the trend toward larger mines. It is becoming more difficult in the US to replace annual production with new reserves. Exploration expenditures of US producers declined for the fifth straight year but at a slower rate owing to increasing prices for gold.

**Silver.** Mines in the US produced 1,470 t in 2001, approximately 16% below production in 2001. Precious metal ores accounted for about 50% of production, the remainder was recovered as a byproduct from the processing of copper, lead and zinc ores. Silver was valued at US\$214 million, and US production represented nearly 7.8% of worldwide production. About 1,100 t of silver was recovered from new and old scrap. The US was a net importer of silver in 2002, importing 3,630 t while exporting only 885 t. In 2000, the US Government disposed of the remaining silver held in the National Defense Stockpile, selling it to the Department of the Treasury for coinage. Demand for silver from the electronics and photographic industries continued to decline during the year as digital imaging has affected silver demand in this market.

**Platinum group metals (PGM).** Ore containing 3,900 kg of platinum – just under 2.2% of worldwide production – and 13,000 kg of palladium – 6.7% of worldwide production – was mined in 2002, concentrated and smelted and the matte exported for refining. US production of both platinum and palladium continued to be at near record levels again in 2002. There is only one primary platinum metals group metals producer in the US. Recycling provided 6 t and net imports were 116,000 kg. The automotive industry is the principal consumer of PGM as oxidation catalysts in catalytic converters. PGMs are also used in jewelry and cancer chemotherapy.

### **Special property minerals (Table 3)**

Many materials needed for high-intensity magnets, electronics, optics, nuclear applications, and resistance to corrosion or high temperatures are by-products from the production, smelting and refining of major mineral materials. The only



domestic source of antimony closed early in 2001 thus all antimony used (16,000 t) was imported. Values for other special property minerals were: arsenic US\$20 million (value of arsenic consumed), beryllium US\$80 million (consumption), cadmium US\$370,000 (production), germanium (refinery products) US\$17 million and rhenium (consumption) US\$22.0 million. The value of rare earth oxides was US\$28 million. Domestic demand for rare earths in 2002 declined from very high levels in 2001. Over 50% of the demand was met with imports. Only one mine continues to produce rare earth oxides in the US and that mine has been forced to close its' separation plant. That plant is not expected to reopen until 2004. The mine continues to produce bastnaesite concentrates and cerium concentrates.

### **Non-metallics**

Mine production of non-metallic industrial minerals is shown in Table 4.

**Construction minerals.** Production of sand and gravel (construction) was 1,130 Mt valued at US\$5.8 billion. Crushed stone production was 1,590 Mt worth US\$9.1 billion and cement output was 89.0 Mt worth US\$7.1 billion. Demand for sand and gravel, crushed stone and cement was slightly lower in 2002. Strong public sector spending offset lower construction activity in other segments of the economy. Ever increasing environmental and safety regulations continue to force quarries to relocate away from highly populated areas. This has resulted in a shortage of construction sand and gravel in these areas.

**Cement.** Production reached 89.0 Mt, which was about 5.3% of worldwide production. Net imports supplied an additional 22 Mt of cement. Concerns remain about emissions of carbon dioxide, cement kiln dust (CKD) and nitrogen oxides generated during the manufacture of cement. Reduction strategies include installation of more fuel-efficient kiln technologies and other process changes.

**Ammonia.** Production of nitrogen (fixed) ammonia was 9.5 Mt in 2002 representing 9.0% of worldwide production. Although the high natural gas prices of 2001 that caused nearly 40% of US capacity to be shut during the first quarter of 2001 had abated, production did not return to pre 2001 levels. Prices for ammonia were low and stocks were at record levels. At least one plant closed permanently citing global competition. The largest ammonia producer in the US filed for bankruptcy in mid 2002. The majority of production capacity is still found in Louisiana, Oklahoma and Texas where there are large supplies of natural gas feedstocks. US consumption of 13.5 Mt was largely used as fertilisers (88%). Ammonia was also used to produce plastics, synthetic fibres, resins, explosives and numerous other chemical compounds.

**Phosphate.** Valued at about US\$990 million at the minemouth, the US produced 35.8 Mt of phosphate rock in 2002 about 27% of worldwide production. Domestic production came mostly from mines in Florida and North Carolina (83% of total production) and the remainder from southeastern Idaho and northwestern Utah. About 95% of the phosphate rock output goes to the

production of phosphoric acids used in making fertilisers. The remainder of US production goes towards industrial applications and exports.

**Sulphur.** Production was at 9.3 Mt (16% of worldwide production) valued at about US\$230 million. Texas and Louisiana accounted for half the US output. Consumption of 10.9 Mt went to the production of agricultural chemicals 60%, petroleum refining 19%, organic and inorganic chemicals 3%, and metal mining 5%. The remaining 14% went towards a variety of widespread industrial uses.

**Lime.** Production reached 18.4 Mt valued at about US\$1.18 billion in 2002 and accounted for 15.9% of worldwide production. Consumption declined to 18.5 Mt and was used in agricultural chemicals, steel production, environmental control and construction. Lime production and use continued to be affected by the difficulties experienced by their largest customer, the steel industry.

*Sources: US Department of Commerce: Bureau of the Census, Bureau of Economic Analysis; US Department of Defense: Defense Logistics Agency; US Department of Energy: Energy Information Administration; US Department of the Interior: US Geological Survey; US Department of Labor: Bureau of Labor Statistics; and various publications of the National Mining Association.*

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Tables next page.

**Table I. US Metal And Mineral Production**  
(Thousand metric tonnes unless otherwise noted)

		2000*	2001*	2002**	% change
Value of non-fuel processed minerals	US\$ billion	406.5	374.0	373.0	-0.27%
Value of non-fuel raw minerals	US\$ billion	39.4	39.0	38.0	-2.56%
of which: non-metallics	US\$ billion	29.3	29.9	30.0	0.33%
metals from US ores	US\$ billion	10.1	9.1	8.0	-12.09%
Coal (anthracite, bituminous, lignite)	Mt	974.0	1,023.0	992.3	-3.00%
Steel (raw)	Mt	101.8	90.1	92.2	2.33%
Steel mill products (shipments)	Mt	98.9	90.2	90.0	-0.22%
Iron and steel castings (shipments)	Mt	10.5	9.1	10.0	9.89%
Iron ore (production)	Mt	63.1	46.1	51.5	11.71%
Iron (purchased scrap)	Mt	56.0	55.0	58.0	5.45%
Aluminum (primary)	'000 t	3,668.0	2,637.0	2,707.0	2.65%
Aluminum (secondary from scrap)	'000 t	1,370.0	1,210.0	1,180.0	-2.48%
Copper (mine)	'000 t	1,440.0	1,340.0	1,130.0	-15.67%
Copper (refined-primary)	'000 t	1,590.0	1,630.0	1,430.0	-12.27%
Copper (refined-secondary)	'000 t	208.0	172.0	70.0	-59.30%
Lead (mine)	'000 t	457.0	454.0	440.0	-3.08%
Lead (refined-primary)	'000 t	341.0	290.0	260.0	-10.34%
Lead (refined-secondary)	'000 t	1,080.0	1,100.0	1,110.0	0.91%
Zinc (mine- recoverable)	'000 t	814.0	799.0	754.0	-5.63%
Zinc (smelters- refined)	'000 t	363.0	311.0	254.0	-18.33%
Magnesium	'000 t	W	W	W	0.00%
Titanium (mill product shipments)	t	25.9	27.9	19.9	-28.67%
Molybdenum (mine)	'000 t	40.9	37.6	32.4	-13.83%
Nickel (plant production)	'000 t	0.0	0.0	0.0	0.00%
Antimony (primary)	'000 t	20.9	18.0	W	0.00%
Mercury (secondary)	t	NA	NA	NA	0.00%
Tin (secondary from scrap)	'000 t	15.1	13.9	10.8	-22.30%
Gold (mine)	t	352.0	335.0	286.0	-14.63%
Gold (secondary)	t	82.0	83.0	85.0	2.41%
Silver (mine)	'000 t	1.8	1.6	1.4	-12.50%
Silver (secondary)	'000 t	1.7	1.1	1.6	45.45%
Platinum group metals (mine)	t	13.4	15.7	16.9	7.64%

Sources: US Geological Survey: Minerals Commodity Summaries 2003, Monthly the US Department of Energy

W = Withheld to avoid disclosing company data NA = Not available

\* Revised      \*\* Preliminary

<b>Table 2. US 2002 Net Import Reliance</b>		
For Selected Non-Fuel Mineral Materials		
<b>Commodity</b>	<b>%</b>	<b>Major Sources (1998-2002)*</b>
Arsenic (trioxide)	100	China, Chile, Mexico
Asbestos	100	Canada
Bauxite and Alumina	100	Australia, Guinea, Jamaica, Brazil
Columbium (niobium)	100	Brazil, Canada, Germany, Estonia
Fluorspar	100	China, South Africa, Mexico
Graphite (natural)	100	China, Mexico, Canada, Brazil
Indium	100	China, Canada, France, Brazil
Manganese	100	South Africa, Gabon, Australia, Mexico
Mica sheet (natural)	100	India, Belgium, Germany, China
Quartz Crystal	100	Brazil, Germany, Madagascar
Strontium	100	Mexico, Germany
Thallium	100	Belgium, Canada, France, Russia, UK
Vanadium	100	South Africa, Canada, China, Czech Republic
Yttrium	100	China, Japan, France, UK
Gemstones	99	Israel, Belgium, India
Bismuth	95	Belgium, Mexico, UK, China
Platinum	93	South Africa, UK, Germany, Russia
Diamond (natural industrial stone)	89	Switzerland, Russia, UK, Ireland
Stone (dimension)	88	Italy, Canada, India, Spain
Titanium Mineral Concentrates	82	South Africa, Australia, Canada, Ukraine
Potash	80	Canada, Russia, Belarus, Germany
Tantalum	80	Australia, China, Japan, Thailand
Tin	79	Peru, China, Indonesia, Brazil, Bolivia
Barite	76	China, India, Canada, Thailand
Iodine	76	Chile, Japan, Russia
Cobalt	75	Finland, Norway, Russia, Canada
Tungsten	70	China, Russia
Palladium	69	Russia, South Africa, UK, Belgium
Chromium	63	South Africa, Kazakhstan, Zimbabwe, Turkey, Russia
Silver	61	Canada, China, Russia, Israel
Zinc	60	Canada, Mexico, Kazakhstan
Rhenium	59	Chile, Kazakhstan, Germany, Russia
Beryllium	55	Kazakhstan, Russia, Brazil, Philippines
Magnesium Metal	54	Canada, China, Russia, Israel
Titanium (sponge)	54	Japan, Russia, Kazakhstan
Rare Earths	53	China, France, Japan, Estonia
Peat	50	Canada
Silicon	47	Norway, South Africa, Russia, Canada
Nickel	43	Canada, Norway, Russia, Australia
Antimony	41	China, Mexico, Belgium, South Africa, Hong Kong
Aluminium	39	Canada, Russia, Venezuela, Mexico
Copper	37	Canada, Chile, Peru, Mexico
Magnesium Compounds	35	China, Australia, Canada, Israel
Nitrogen (fixed), Ammonia	29	Trinidad and Tobago, Canada, Ukraine
Garnet (industrial)	28	Australia, India, China

Pumice	28	Greece, Italy, Turkey
Diamond (dust, grit and powder)	27	Ireland, China, Ukraine
Gypsum	25	Canada, Mexico, Spain
Mica, scrap and flake (natural)	24	Canada, India, Finland, China
Perlite	23	Greece
Cement	19	Canada, Thailand, China, Venezuela, Greece
Lead	18	Canada, Mexico, Australia, Peru
Salt	18	Canada, Chile, Mexico, The Bahamas
Sulphur	15	Canada, Mexico, Venezuela
Iron and Steel	14	European Union, Canada, Japan, Mexico
Iron Ore	11	Canada, Brazil, Australia, Venezuela
Talc	8	China, Canada, France, Japan
Iron and Steel Slag	6	Italy, Japan, Canada
Phosphate Rock	6	Morocco
* countries listed in descending order of importance		
Source: US Geological Survey. Mineral Commodity Summary 2003		

**Table 3. Special Property Metals**

(Metric tonnes except where noted)

	US Mine	Production	Change from 2001
	2001(r)	2002(p)	(%)
Beryllium	100	100	0.0%
Cadmium (refinery production)	680	700	2.9%
Cobalt (secondary)	2,740	2,700	-1.5%
Germanium (refinery products) (kg)	20,000	20,000	0.0%
Rare Earth Oxides	5,000	5,000	0.0%
Rhenium (kg)	11,800	9,400	-20.3%

Data on production of Lithium, Selenium and Tellurium are withheld. There was no 2001 or 2002 production of Antimony, Mercury or Scandium.

Source: US Geological Survey Mineral Commodity Summaries, 2003

(p) Preliminary. (r) revised



**Table 4. Non-Metallic Minerals\***

(Thousand metric tonnes unless otherwise noted)

	US mine production	US mine production	Change from 2001
	2001 <sup>(r)</sup>	2002 <sup>(p)</sup>	(%)
Asbestos	5	3	-40.0
Barite	400	400	0.0
Boron	536	620	15.7
Bromine	212	225	6.1
Cement	88,900	89,000	0.1
Clays	40,000	40,700	1.8
Diatomite	644	700	8.7
Feldspar	800	820	2.5
Garnet	53	47	-11.3
Graphite (natural)	-	-	0.0
Gypsum (crude)	16,300	16,100	-1.2
Iodine ('000 kg)	1,290	1,700	31.8
Iron and Steel Slag	16,900	16,500	-2.4
Kyanite	90	90	0.0
Lime	18,900	18,400	-2.6
Magnesium Compounds (Mg content)	388	395	1.8
Mica (scrap and flake)	98	84	-14.3
Peat	870	760	-12.6
Perlite	588	548	-6.8
Phosphate Rock	31,900	35,800	12.2
Potash (K <sub>2</sub> O)	1,200	1,200	0.0
Pumice	920	950	3.3
Salt	44,800	43,900	-2.0
Sand and Gravel (construction) (Mt)	1,130	1,130	0.0
Sand and Gravel (industrial)	27,900	28,000	0.4
Soda Ash	10,300	10,300	0.0
Sodium sulphate	512	500	-2.3
Stone, Crushed (Mt)	1,600	1,590	-0.6
Stone, Dimension	1,220	1,300	6.6
Sulphur (Recovered)	8,270	8,300	0.4
Sulphur (other)	982	980	-0.2
Talc and Pyrophyllite	853	830	-2.7
Titanium Dioxide (TiO <sub>2</sub> ) (mfg.)	1,330	1,380	3.8
Zircon	100	100	0.0

Source: US Geological Survey. (r): Revised. (p): Preliminary.

**Table 5. Old Scrap Reclaimed**

	<b>2002 t (p)</b>	<b>% of apparent Consumption</b>
Aluminium	1,200,000	20%
Chromium	152,800	37%
Cobalt	2,700	31%
Copper	250,000	9%
Gold (old + new)	85	50%
Iron and Steel Scrap	82,000,000	100%
Lead	1,100,000	69%
Magnesium	27,000	23%
Mercury	NA	100%
Nickel	111,000	57%
Platinum Group (old + new)	70	na
Silver (old + new)	1,100	21%
Tin	7,000	13%
Tungsten	4,500	35%
Zinc	70,000	5%

Plus minor percentages of several other metals.

Source: US Geological Survey, Minerals Commodity Summaries, 2003

n.a.: Not available (p): Preliminary.