

THE UNITED STATES

By Jack N. Gerard

President and Chief Executive Officer, The National Mining Association

The year 2000 began with the strongest economy in US history. By the end of the year however, higher interest rates and much higher energy costs were taking a toll and the rate of economic growth in the fourth quarter had dropped by more than half when measured against the first quarter of the year. During 2000, helped by a strong first half, the US Economy, as measured by current dollar GDP rose to US\$9,963.1 billion an increase of 7.1% over 1999. Initial low inflation and low unemployment levels continued to lead to record levels of both consumer spending and private investment. As pointed out, by the end of the year the rate of increase in all economic indicators had slowed. Domestic production of most metals and minerals either increased only marginally or actually declined again in 2000. As measured by value, the demand for minerals

and mineral products increased by 1.7% to US\$429 billion. The total value of non-fuel raw minerals increased by 5.3% in 2000 to US\$40.1 billion. The steep decline in world prices for metals abated somewhat in 2000 and, although production was generally lower, the value of metal mine production in the US increased by 5.3% to US\$9.9 billion. The value of non-metals was also up, by almost 6% to US\$30.3 billion. (Note that all 1999 data have been revised.)

The estimated value of coal, crude oil and natural gas production was US\$148.3 billion, 56 % greater than in 1999. Actual US production of coal and crude oil declined again in 2000, production of natural gas was 3.0 % higher, but the value of both crude and natural gas at the well head was sharply higher in 2000 accounting for the very sharp

KOMATSU

Smart Solutions
Smart Choice

Your *GLOBAL*
Full Line Solutions
Provider

Serving the Mining Industry with...

- Broadest Line of Equipment
- State-of-the-Art Technology
- World Wide Support
- A Focus on Safety

Web
www.komatsu-mining.com

increase in value of energy produced. The value of coal at the mine declined slightly.

Employment in mining, including petroleum workers, increased to an average 548,000 as compared to the 535,000 workers in 1999. The Mine Safety and Health Administration (MSHA) reported that mine fatalities totaled 86 in 2000: 38 in coal and 47 in other mines.

The producer price indexes (PPI) most closely associated with mineral products moved higher in 1999 (1982=100). The PPI for metals and metal products increased by 2.8 % to 128.1 as metal prices turned around from the lows of 1998. The PPI for non-metallic mineral products increased by 2.6% to 142.5. The PPI for fuels and related products and power increased 16.7% going from 80.6 in 1999 to 94.1 in 2000. This was due to the increase in both oil and natural gas prices.

The US trade deficit in goods and services continued to increase in 2000 to US\$368.9 billion. Imports of consumer goods, capital goods and services were all higher. Imports of petroleum and petroleum products increased in 2000 to 4,060 Mbbl. This was the highest level in history and marked the eighth consecutive year in which imports have increased. Due to the aforementioned sharp increase in prices, the estimated value of these imports rose to US\$119.9 billion, 77% higher than in 1999. The value of exports of petroleum and petroleum products increased to an estimated US\$10.1 billion. The value of coal exported totaled US\$2.1 billion, lower than in 1999 due to slightly lower prices.

Total US trade (exports and imports) in raw minerals and processed material of mineral origin was valued at US\$114 billion in 2000. Imports of processed mineral material were valued at US\$71 billion, while exports were an estimated US\$43 billion for a mineral trade deficit of US\$29 billion US\$4 billion higher than in 1999. The US imported more copper and aluminum. Exports of most raw minerals

were down due in part to the stronger value of the US dollar against other currencies. Imports of metal ores and concentrates and of raw industrial minerals increased to US\$4 billion, but exports of these same materials totaled US\$3 billion.

Legislation and Regulation

Research and Development: The US mining industry continued to expand the research and development programme carried out in conjunction with the Department of Energy (DOE). In June, 1998, the National Mining Association, and the DOE signed an agreement in June 1998 to conduct joint pre-commercialization research with several goals in mind: Low Cost and Efficient Production; Superior Exploration and Resource Characterisation; Safe and Efficient Extraction and Processing; Responsible Emission and By-product Management; Advanced Products; Positive Partnerships with Government, and Improved Communication and Education. National laboratories, industry and academia are participating in this programme, which is designed to make the US mining industry more competitive. In 2000, project awards totaling close to US\$1.5 million were awarded.

Climate Change: Although in 1997, the US and 168 countries signed the Kyoto Protocol on Climate Change by the end of 2000, most developed nations – including the US - were not close to ratification of the agreement. Negotiations designed to develop rules under which the Protocol would be implemented fell apart at The Hague in November 2000. In March 2001 the US Administration announced that it would not seek to ratify the Protocol in the US Senate because the Protocol, which was intended to reduce the greenhouse gas emissions of 38 countries to an average of 7% below 1990 levels by 2008-2012 with further reductions to follow, would be economically damaging to the US and to all other countries. Additionally there would be no discernable emissions reductions due to the protocol; because it is limited in terms

of nations bound, there would be no effect. The US announced a review of climate policies with the intention of implementing domestic policies to reduce greenhouse gas emissions on a voluntary basis.

Land Use: There was no action on legislation to reform the Mining Law of 1872 in 2000. The National Academy of Sciences completed a study of environmental and reclamation requirements and determined that existing laws and regulations are sufficient to ensure protection of federal lands. Nevertheless, the Department of the Interior proposed regulations that would go beyond the recommendations of the NAS. At the end of 2000 these proposed regulations were awaiting final action. The US Forest Service proposed to remove a large amount of reserves located on Forest Service lands from exploration and development (The Forest Service Roadless Initiative). This rule was also pending at the end of 2000.

Environment: Several ongoing environmental issues would affect the domestic minerals industry - all remained pending at the end of the year. In September 1998, The Environmental Protection Agency (EPA) promulgated a new requirement for 22 states in the east that mandates NOX emission reductions of approximately 85%. This rule would go into effect in 2003 and would require costly modifications to coal-fired units, thereby, affecting coal demand in the region. At the end of 2000 the EPA announced its intention to regulate mercury emissions from power plants. Rules will be proposed in 2003. The EPA is also attempting to reclassify carbon dioxide as a pollutant under the US Clean Air Act. Industry has objected to this rule making which has yet to be finalized.

Human Resources: Pending legislation that would impact managed health care programmes was passed in both the House and the Senate, but as a conference committee was unable to resolve differences, the legislation died at the end of the Congressional session.

Mineral Stockpile

During fiscal year 2000 (ended September 30, 2000), the Defense Logistics Agency (DLA) sold excess mineral materials valued at US\$670.1 million. This was 50% higher than sales in 1999. FY 2000 sales included US\$39.1 million of silver transferred at market prices to the Department of the Treasury. Sales of tin (US\$65.7 million), cobalt (US\$72.0 million), platinum-palladium (US\$60.4 million), platinum (US\$52.2 million); silver (US\$39.1 million), tantalum minerals (US\$27.1 million), lead (US\$23.0 million), diamond stones (US\$33.4 million), chromium (US\$30.5 million), and manganese ferro high carbon (US\$11.2 million), made up 63% of the value.

Energy ¹

The US consumed 98.5 quadrillion Btu (quads) of energy in 2000 (1.7% more than in 1999) with market shares as follows: 38.5% petroleum, 23.7% natural gas, 22.8% coal, 8.1% nuclear, 3.2% hydroelectric and 3.7% from geothermal, wind, biomass, solar and other renewable sources. Domestic production of energy supplied 71.9 quads and net imports added another 26.6 quads.

According to preliminary data, domestic production of crude oil declined by 0.7% to 2,135 Mbbl. This is the lowest rate of decline in several years. Imports of crude oil and petroleum products increased by 2.3% to 3,269 Mbbl. At year-end, 541 Mbbl. were stored in the Strategic Petroleum Reserve. Natural gas production, on a dry basis, totaled 19,258 billion ft³, 3.4% higher than in 1999. Meanwhile, natural gas imports continued to rise and, on a net basis, totalled 3,533 billion ft³, 3.2% higher than in 1999. Approximately 94% of US imports of natural gas come from Canada.

Coal production fell for the second consecutive year to 975.7 Mt. Coal had an estimated value of US\$18.5 billion. About 64% of this production came from surface mines and 36% came from

¹ All energy data have been revised by the DOE's Energy Information Administration.

underground mines. Western production (which is primarily from the Powder River Basin which is located in Wyoming and Montana) accounted for 53% of US coal production. There are approximately 1,500 coal mines in the US.

Coal production levels in Illinois, Indiana and in West Kentucky declined in 2000 reflecting several mine closures owing to the long-term decline in demand for the high sulphur coals that are mined in these states. Production increased in West Virginia and Virginia owing to a slight up tick in demand for metallurgical coals. Production of sub-bituminous coals from the west continued to increase although not as rapidly as in years past. Currently, the states with the largest coal production are Wyoming with 307.8 Mt and West Virginia with 144.8 Mt. Productivity continued its sharp increase, reaching an average of 7.6 t/h in 2000. This is 7% higher than average output on 1999.

Domestic coal consumption in 2000 reached 979.9 Mt, with 890.0 Mt going to generate electricity (approximately 52% of the US 2000 electrical production was from coal). The industrial sector consumed another 59.1 Mt and 26.6 Mt was used for coking. Together, the commercial and retail sectors consumed 4.4 Mt.

The US exported 53.1 Mt of coal in 2000, equal to exports in 1999. Shipments to the traditional European and South American markets increased from 1999's low levels while shipments to Asian nations were essentially flat. Steam coal however is rapidly taking the place of metallurgical coal in the Asian market. Metallurgical coal exports to both Japan and Korea had dropped to near zero by the end of 2000. Exports to Canada declined in 2000. Coking coal accounted for approximately 58% of exports. Coal imports, primarily from Colombia, Venezuela, and Indonesia in the form of low-sulphur steam coal for utilities in Florida, increased to 11.2 Mt.

Iron, Steel, and Ferro-alloys

Raw steel production in 2000 was 101.5 Mt, 4.2% higher than production in 1999. Production

was especially strong in the first half of the year, but trended downward especially during the final quarter. 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 remained at 53.8% of total in 2000, the first time in several years that this type of steel production did not decline in terms of percentage of total. Electric arc furnace production was 46.2% of total. Continuous casting accounted for 96.1% of processed steel production. By the end of the year prices had declined significantly and US steel producers appealed to the US Government for more vigorous enforcement of trade laws. In the spring of 2001 the US Department of Commerce agreed to an investigation of alleged dumping of steel into the US market.

Shipments included 105 Mt of steel mill products, 1.3 Mt of steel castings, and 9.8 Mt of iron castings. Imports of steel mill products, after a decline in 1999, increased to 36.8 Mt in 2000.

Reported consumption of iron and steel scrap was 68 Mt, 3 Mt lower than in 1999. This was due to an increase in imports of low-cost finished and semi-finished steel. The US was a net exporter of scrap in 2000. The total value of purchased scrap and exports was US\$6.6 billion, up 23% and reflecting a turn around in prices for scrap. Iron and steel slag used or sold in 2000 was 19 Mt valued at about US\$153 million.

In 2000, 12 mines, 10 concentrating plants and 10 pelletising plants shipped 61 Mt of usable iron-ore worth US\$1.7 billion to customers in the US and abroad. The US is a net importer of iron-ore, and net imports totalled 11.8 Mt in 2000. Fluctuating steel production in the US as well as basic structural changes in the steel industry continue to change the practices of US iron-ore producers. Some iron-ore producers, in anticipation that the supply of scrap may be insufficient to meet the demand for new steel capacity, are investing in new technologies including reduced iron (DRI) projects. Iron-ore

producers are also considering trade actions against imports and there is some indication that a case against iron-ore imports may be included in the investigation of steel imports. Some iron-ore producers are closing capacity especially in the iron-ore ranges in Minnesota.

There was no domestic production of chromium, manganese, nickel, cobalt or tungsten. Small amounts of vanadium were mined in 2000, but information about production is not available. Based on contained metal, net imports of chromium totalled 352,000 t, manganese 1,148,000 t, cobalt 5,700 t, primary and secondary nickel 122,500 t, tungsten 7,840 t, and vanadium 3,760 t. US molybdenum production declined to 40,100 t valued at US\$94 million (based on average oxide prices). US production accounted for 36% of estimated worldwide production in 2000. The decline in US production was directly correlated to lower price levels. Iron and steel producers account for 75% of the molybdenum consumed. Molybdenum exports were 27,400 t.

Light Metals

Aluminum: Primary production totaled 3.7 Mt with an estimated value of US\$6.1 billion, roughly 15.5 % of worldwide production. In 2000, 1.6 Mt was recovered from old scrap. The US imported 4.2 Mt, which was partially offset by 1.8 Mt of exports. Consumption grew 2.1% totalling 7.9 Mt: transportation accounted for 37%, packaging 22%, building 15%, electrical 8%, consumer durables 8%, 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 9.3 Mt of imported bauxite (of which 96% went to the production of alumina) and the 4.5 Mt net imports of alumina. Primary production of aluminum will decline in 2001 as several producers are temporarily closing capacity in order to sell electrical power into the western US market.

Magnesium: Two companies produced primary magnesium metal in 2000, one in Utah and one in Washington. Total capacity in 1999 was 83,000 t, slightly higher than in 1999 but lower than in the past decade owing to a late 1998 closure of the one production facility in Texas. As there are now only two producers, neither actual production amounts nor value is available from published sources. Recovery of old scrap supplied 34,000 t of magnesium metal and net imports totalled 70,000 t. As a result of trade actions, countervailing duties on imports of magnesium were imposed in 2000. Apparent consumption was 175,000 t, 44% in aluminum-based alloys, 45% in castings and wrought magnesium products, 7% was used for desulphurisation of iron and steel, 3% for reducing agents in nonferrous metals production and 1% for other magnesium containing products. Although lagging behind European automakers in the use of magnesium in cars, US demand for magnesium castings will increase as the average unit content of magnesium diecastings in North American built cars and light trucks increases. In fact, use of magnesium in automobiles increased by 12.5% in 2000. However, owing to limited production capacity, imports are likely to increase in tandem.

Titanium: Only two firms produce titanium sponge metal in the US and thus mine production and primary metal production is not available. Most titanium is consumed as titanium dioxide (TiO₂) pigment. Four companies produced a record 1.44 Mt of TiO₂ pigment in 2000 valued at US\$3.1 billion. Imports of sponge metal increased from 1999s low levels to 7,800 t, and exports increased to 1,900 t. TiO₂ exports were 407,000 t. Consumption of sponge metal declined in 2000 to 17,500 t due to lower demand from commercial aircraft manufacturers that use approximately 60%. The remainder is used in the chemical process industry, and in the power generation, marine, ordnance, medical and other non-aerospace industries. TiO₂

consumption was 1.19 Mt, 50% in paints, varnishes and lacquers, 21% in plastics and 29% in ceramics, coated fabrics, printing ink, paper and other uses.

Non-ferrous Metals

Copper: Copper production declined for the fourth consecutive year in 2000, totaling 1.47

Mt, 7.5% below 1999 levels. Although production was down, the value of production remained at US\$2.8 billion reflecting a recovery in the copper price. US production represented 11.2% of worldwide output in 2000. Refined copper production declined to 1.6 Mt. Old scrap provided 360,000 t with net imports (ores and concentrates, refined and

| US Metal and Mineral Production | | | | |
|--|-------------------|-------------------|-------------------|---------|
| | 1998 ^r | 1999 ^r | 2000 ^p | change |
| Values (US\$ billion) | | | | |
| Value of non-fuel processed minerals | 415.0 | 422.0 | 429.0 | 1.66% |
| Value of non-fuel raw minerals | 40.1 | 39.1 | 40.1 | 2.56% |
| of which: | 29.5 | 28.7 | 30.3 | 5.57% |
| Non-metallics | | | | |
| metals from US ores | 10.6 | 9.4 | 9.9 | 5.32% |
| Production ('000 t except where stated) | | | | |
| Coal (Mt) | 1,013.8 | 998.3 | 975.7 | -2.26% |
| Steel (raw) (Mt) | 98.7 | 97.4 | 101.5 | 4.21% |
| Steel mill products (shipments) (Mt) | 92.9 | 96.3 | 99.4 | 3.22% |
| Iron and steel castings (shipments) (Mt) | 11.0 | 11.1 | 11.1 | 0.00% |
| Iron ore (production) (Mt) | 62.9 | 57.4 | 63.0 | 9.76% |
| Iron (purchased scrap) (Mt) | 56.0 | 53.0 | 40.0 | -24.53% |
| Aluminium (primary) | 3,713.0 | 3,779.0 | 3,668.0 | -2.94% |
| Aluminium (secondary from scrap) | 1,500.0 | 1,550.0 | 1,430.0 | -7.74% |
| Copper (mine) | 1,860.0 | 1,600.0 | 1,470.0 | -8.13% |
| Copper (refined-primary) | 2,140.0 | 1,890.0 | 1,590.0 | -15.87% |
| Copper (refined-secondary) | 349.0 | 230.0 | 208.0 | -9.57% |
| Lead (mine) | 493.0 | 505.0 | 447.0 | -11.49% |
| Lead (refined-primary) | 337.0 | 350.0 | 341.0 | -2.57% |
| Lead (refined-secondary) | 1,060.0 | 1,080.0 | 1,110.0 | 2.78% |
| Zinc (mine- recoverable) | 755.0 | 843.0 | 828.0 | -1.78% |
| Zinc (smelters- refined) | 234.0 | 356.0 | 363.0 | 1.97% |
| Magnesium | 106.0 | W | W | - |
| Titanium (mill product shipments) | 28.8 | 24.2 | 25.9 | 7.02% |
| Molybdenum (mine) | 53.3 | 43.0 | 40.7 | -5.35% |
| Nickel (plant production) | 4.3 | 0.0 | 0.0 | 0.00% |
| Antimony (primary) | 24.0 | 23.8 | 20.8 | -12.61% |
| Mercury (secondary) (t) | n.a. | n.a. | n.a. | - |
| Tin (secondary from scrap) | 16.1 | 16.3 | 16.9 | 3.68% |
| Gold (mine) (t) | 366.0 | 341.0 | 338.0 | -0.88% |
| Gold (secondary) (t) | 163.0 | 143.0 | 140.0 | -2.10% |
| Silver (mine) | 2.1 | 2.0 | 2.0 | 0.00% |
| Silver (secondary) | 1.7 | 1.5 | 1.6 | 6.67% |
| Platinum group metals (mine) (t) | 13.8 | 12.7 | 13.1 | 3.15% |

Sources: US Geological Survey, *Minerals Commodity Summaries 2000*, Mineral Industry Surveys; American Iron and Steel Institute; National Mining Association; US Department of Energy
W - Withheld to avoid disclosing company data; ^r Revised; ^p Preliminary

unmanufactured) increasing to 1.2 Mt. Apparent consumption was 3.1 Mt – 41% in building construction, 27% electric and electronic products, 10% in industrial machinery and equipment, 12% transportation equipment and 10% consumer and general products. Domestic demand for refined copper, in particular, wire mill products used in the telecommunications industry was essentially unchanged in 2000. Copper prices were low in 1999 strengthened in 2000 as production declined, and stocks were drawn down.

Reorganisation of the US copper industry was essentially completed by the beginning of 2000 as Phelps Dodge completed the acquisition of Cyprus Amax Minerals and Grupo Mexico finalized its takeover of Asarco Inc. Capacity continued to decline with the long-term closures of BHP's copper properties in the US. Copper production was further affected by high energy costs and power disruptions. US production capacity is expected to decline further in 2001.

Lead: Mine output in 2000 was 447,000 t some 11.5% below 1999 levels owing to reduction in production by one major producer. Mine output had a value of approximately US\$432 million. US output represented approximately 16% of worldwide production. Old scrap provided over 1.1 Mt. The US was a net exporter of lead, and net exports were 55,000 t. Apparent consumption was 1.8 Mt with 76% used in batteries, fuel tanks, solder, seals and bearings, 22% used in electrical, electronic, communications, ammunition, television glass, construction, and protective coatings and 2% used in weights, crystal glass, tubes and containers, type metal, foil, wire and specialised chemicals. Demand for automotive (replacement batteries) was steady in 2000 but demand for industrial-type stationary and traction batteries continued to increase as did demand for batteries used in the telecommunications and computer industries.

Zinc: Nineteen mines produced 828,000 t valued at about US\$973 million in 2000. This was 11% of estimated worldwide production. Old scrap provided 90,000 t and net imports reached 503,000 t. Imports were higher because production in Alaska is processed in Canada and then shipped to the US for use thus counting as an import. Consumption of all forms was 1.7 Mt with 57% used in galvanizing, 17% in zinc-based alloys, 13% in brass and bronze, and 13% for other uses. Use of galvanized steel products continued to increase in 2000.

Tin: While there was no domestic production of primary tin, 8,900 t were recovered from old scrap and 12,000 t came from the government stockpile. Net imports were 41,000 t. The US consumed 37,000 t of primary tin with 30% in cans and containers, 20% electrical 10% in both transportation and construction and 30% in other uses. The UK-based International Tin Research Institute, now in its sixth year and supported by the producers and consumers of tin, continued to report progress in many areas of research to develop new uses for tin including a tin foil capsule to replace lead foil capsules used on wine bottles.

Precious Metals

Gold: Mine production of 338 t was essentially the same as the 341 t mined in 1999. Production was valued at US\$3.1 billion. US production was approximately 13% of worldwide production. Exports of refined gold, based on revised data, were 435 t in 1999 and 488 t in 2000. Domestic output continued to be centred in Nevada and California with 80% of 2000 mine production located in those states. Between July 1999 and June 2000 nine gold mines were closed and two mines were reopened in the US. There were no new mines opened in this time. Mergers and acquisitions continued, as did the trend toward larger mines. Most larger companies were successfully replacing production with new reserves, but smaller companies continued to find this difficult. Due to continued low prices, exploration

expenditures of US producers continued to fall.

Silver: Silver mines in the US produced 1,950t in 2000 equal to 1999 production. Silver was valued at US\$320 million, and US production represented nearly 12% of worldwide production. About one-half of this was from precious metal ores; the remainder was from base metal ores. Recycling added an additional 1,600 t. The US was a net importer of silver in 2000, importing 3,810 t while exporting only 279 t. As pointed out in a previous section, the US Government continued to dispose of the silver held in the National Defense Stockpile, selling it to the Department of the Treasury. Demand for silver from the electronics and photographic industries declined during the year as digital imaging is affecting silver demand in this market.

Platinum Group Metals: In 2000, ore containing 3,050 kg of platinum – just under 2% of worldwide production – and 10,000 kg of palladium – 6.5% of worldwide production – was mined, concentrated and smelted and the matte exported to Belgium for refining since no domestic processing facilities are in operation. US production of both platinum and palladium continued to be a near record levels in 2000. Recycling provided 70 t and net imports were 170,000 kg. The automotive industry is the principal consumer of platinum group metals (PGM) as oxidation catalysts in catalytic converters. PGM are also used in

jewellery and cancer chemotherapy. The expansion programme at the only active US mine continued in 2000 with capacity expected to be a minimum of 16,300 kg of platinum and palladium by the end of 2001.

Special Property Minerals

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 estimated value of antimony (metal and oxide) production increased in 2000 to US\$58 million. Mine production of recoverable antimony (from the one silver mine in Idaho that produces antimony as a by-product) decreased from 449 t in 1999 to 340 t in 2000. Values of production estimates for others include: arsenic US\$20 million (value of arsenic consumed), beryllium US\$1140 million, cadmium US\$265,000 million, germanium (refinery products) US\$22 million, and rhenium (consumption) US\$44.4 million. The value of rare earth oxides was US\$14 million. Although domestic demand for rare earths in 2000 was higher than that of 1999, the increase in demand was met with a sharp increase in imports. The one US mine producing rare earth oxides was forced to close temporarily its separation plant. The plant is expected to resume operations at some level during 2001. The mine continued to produce baestnasite concentrates and cerium concentrates.

| Speciality Metal Production (t except where stated) | | | |
|--|-------------|-----------------|---------------|
| | 1999 | 2000 (p) | Change |
| Antimony | 449 | 340 | -24.3% |
| Beryllium | 200 | 255 | 27.5% |
| Cadmium (refinery production) | 1,190 | 1,200 | 0.8% |
| Cobalt (secondary) | 2,720 | 2,800 | 2.9% |
| Germanium (refinery products) (kg) | 20,000 | 19,000 | -5.0% |
| Rare Earth Oxides | 5,000 | 5,000 | 0.0% |
| Rhenium (kg) | 12,000 | 9,000 | -25.0% |

Data on production of Lithium, Mercury, Scandium, Selenium and Tellurium are withheld

Source: US Geological Survey

(p) - Preliminary.

Non-metallics

Construction minerals: Production of sand and gravel (construction and industrial) was 1,170 Mt valued at US\$5.7 billion. Crushed stone production grew to 1,590 Mt worth US\$8.7 billion and cement output rose to 90.6 Mt worth US\$7.2 billion. Demand for these minerals remained robust owing to the continued expansion of the US economy and an increase in outlays for highway construction. However, increasing environmental and safety regulations are forcing quarries to relocate away from highly populated areas, a trend that is expected to continue.

Cement: Production reached 90.6 Mt, which was about 5.4% of worldwide production. Net imports supplied an additional 28 Mt of cement. The US Environmental Protection Agency remains concerned about emissions of both carbon dioxide and cement kiln dust (CKD) generated during the manufacture of cement. In 1999, the EPA published standards for handling cement kiln dust. Comments were evaluated in 2000, but final regulations had not been issued as of the end of the year.

Ammonia: Production of nitrogen (fixed) ammonia was 13 Mt in 2000 representing 12.3% of worldwide production. High natural gas prices led to extended shut downs during the year and as a result, US producers were operating at far below capacity. The majority of production capacity is still found in Louisiana, Oklahoma and Texas because of large supplies of natural gas feedstocks. US consumption of 16.5 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\$1.0 billion at the minemouth, the US produced 39.7 Mt of phosphate rock in 2000, about 29% of worldwide production. Domestic production came mostly from mines in Florida and North Carolina (85% of total production) and the remainder from southeastern Idaho and northwestern Utah. About 90% of the phosphate rock output goes to the production of phosphoric acids used in making fertilisers. The remainder of US production goes

| Non Metallic Mineral Production (t unless otherwise noted) | | | |
|---|---------------------------|---------------------------|---------------|
| | 1999^(r) | 2000^(p) | Change |
| Asbestos | 7 | 5 | -28.6 |
| Barite | 434 | 600 | 38.2 |
| Boron | 618 | 627 | 1.5 |
| Bromine | 239 | 229 | -4.2 |
| Cement (portl& & masonry) | 85,952 | 90,600 | 5.4 |
| Clays | 42,200 | 40,700 | -3.6 |
| Diatomite | 747 | 808 | 8.2 |
| Feldspar | 875 | 850 | -2.9 |
| Garnet | 61 | 50 | -18.0 |
| Graphite (natural) | - | - | 0.0 |
| Gypsum (crude) | 22,400 | 25,000 | 11.6 |
| Iodine (000 kg) | 1,620 | 1,440 | -11.1 |
| Iron & Steel Slag | 19,000 | 19,000 | 0.0 |
| Lime | 19,600 | 20,100 | 2.6 |
| Magnesium (Mg content) | 395 | 400 | 1.3 |
| Mica (scrap & flake) | 104 | 110 | 5.8 |
| Perlite | 711 | 675 | -5.1 |
| Phosphate Rock | 40,600 | 39,700 | -2.2 |
| Potash (K ₂ O) | 1,200 | 1,300 | 8.3 |
| Pumice | 643 | 749 | 16.5 |
| Salt | 44,900 | 45,300 | 0.9 |
| S& & Gravel (construction) (Mt) | 1,110 | 1,170 | 5.4 |
| S& & Gravel (industrial) | 28,900 | 29,500 | 2.1 |
| Soda Ash | 10,200 | 10,200 | 0.0 |
| Stone, Crushed (Mt) | 1,540 | 1,590 | 3.2 |
| Stone, Dimension | 1,250 | 1,250 | 0.0 |
| Sulphur (Frasch & recovered) | 10,000 | 9,400 | -6.0 |
| Sulphur (other) | 1,320 | 1,000 | -24.2 |
| Talc & Pyrophyllite | 925 | 961 | 3.9 |
| Titanium Dioxide (TiO ₂) (mfg.) | 1,350 | 1,440 | 6.7 |

Source: US Geological Survey. (r) - Revised. (p) - Preliminary
Production of Ilmenite, Kyanite, Rutile, Sodium Sulphate, Vermiculite & Zircon withheld

towards industrial applications and exports.

Sulphur: Production was at 10.4 Mt (18% of worldwide production) valued at about US\$320 million. Texas and Louisiana accounted for half the US output. Consumption of 13.3 Mt went to production of agricultural chemicals 70%, petroleum refining 15%, organic and inorganic chemicals 5%, and metal mining 6%. The remaining 4% went towards a variety of widespread industrial uses.

Lime: Production reached 20.5 Mt valued at about US\$1.2 billion in 1998 and accounted for 17.4% of worldwide production. Consumption reached a high of 20.6 Mt used in agricultural chemicals, steel production, environmental control and construction.

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 publication of the National Mining Association.

| Recycled Scrap 2000 ^p (t) | | |
|--------------------------------------|------------|------------------|
| | | % of Consumption |
| Aluminum | 1,600,000 | 20% |
| Chromium | 104,800 | 21% |
| Cobalt | 2,800 | 33% |
| Copper | 360,000 | 12% |
| Gold (old + new) | 140 | 56% |
| Iron and Steel Scrap | 62,000,000 | 100% |
| Lead | 1,100,000 | 66% |
| Magnesium | 34,000 | 19% |
| Mercury | n.a. | 100% |
| Nickel | 88,000 | 43% |
| Platinum Group (old & new) | 70 | n.a. |
| Silver (old & new) | 1,600 | 21% |
| Tin | 8,900 | 18% |
| Tungsten | 5,300 | 36% |
| Zinc | 90,000 | 5% |

Source: US Geological Survey

n.a. - Not available

^p - Preliminary