

Mineral Industry Surveys

For information, contact:

Henry E. Hilliard, Platinum-Group Metals Commodity Specialist
U.S. Geological Survey
989 National Center
Reston, VA 20192
Telephone: (703) 648-4970
Fax: (703) 648-7757
E-mail: hhilliar@usgs.gov

Mahbood Mahdavi (Data)
Telephone: (703) 648-7778
Fax: (703) 648-7975
E-mail: mmahdavi@usgs.gov
Wanda G. Wooten (Data)
Telephone: (703) 648-4980
Fax: (703) 648-7975
E-mail: wwooten@usgs.gov

Internet: <http://minerals.usgs.gov/minerals>

PLATINUM-GROUP METALS IN JANUARY 2004

During the fourth quarter of 2003, Stillwater Mining Company, Columbus, MT, produced 3,515 kilograms (kg) of palladium and 1,058 kg of platinum, which was about the same as production in the fourth quarter of 2002. The company's realized price per troy ounce (ounce) for the fourth quarter of 2003 was \$315 for palladium and \$675 for platinum, compared with \$412 and \$529, respectively, in the fourth quarter of 2002. Stillwater's average realized combined price per ounce for palladium and platinum for the fourth quarter of 2003 was \$424 per ounce, approximately 28% above the combined market price per ounce of \$330 but approximately 4% lower than the \$440 combined price realized for the same period in 2002. For the year 2003, Stillwater produced 13,997 kg of palladium and 4,168 kg of platinum compared with 14,805 kg of palladium and 4,386 kg of platinum in 2002. The company's realized price per ounce for 2003 was \$352 for palladium and \$602 for platinum, compared with \$436 and \$511, respectively, for 2002. For 2003, the company's average realized combined price per ounce for palladium and platinum was \$408 per ounce, or approximately 30% higher than the combined market price of \$315 per ounce but approximately 10% lower than the \$454 per ounce combined price realized in 2002 (Stillwater Mining Company, 2004, p. 2).

North American Platinum's Lac des Îles Mine, Ontario, Canada, produced 2,927 kg of palladium in the fourth quarter of 2003. Byproduct output included 229 kg of platinum, 240 kg of

gold, 638 metric tons (t) of nickel, and 1,041 t of copper. The palladium head grade during the quarter was 2.6 grams per ton (g/t), and the recovery rate was 75%. The fourth quarter was the second consecutive quarter in which the mine's new crusher was fully operational (Mining Journal, 2004).

A U.S. Department of Energy (DOE) study on platinum availability for future applications such as fuel cells was released on December 28, 2003. The study assesses the long-term availability and price stability of platinum given anticipated demand from fuel cell vehicles. The timeframe for the future demand projections is from 2005 to 2050. Key findings of the study are:

- Primary platinum demand is expected to increase at a rate of three to six times the level seen between 1960 and 2000 if fuel cell vehicles are commercially viable.
- There are sufficient platinum resources and reserves to meet long-term projected platinum demand. Economic extraction of primary platinum will depend on the continuing advancement of mining technology. The platinum industry has the potential to meet a scenario where fuel cell vehicles achieve 50% market penetration by 2050, while an 80% scenario could exceed the expansion capabilities of the industry. Recycled platinum from the transportation sector will be an increasingly critical source of supply.

Notice

Beginning in January 2004, the monthly data published in the Mineral Industry Surveys (MIS) for "precious metals" will be published as three separate MIS. The new monthly MIS will be "gold," "silver," and "platinum-group metals;" this change conforms monthly reporting with annual reporting. The 2003 monthly MIS for "precious metals" will remain on the USGS minerals information Web site until the January 2005 MIS for "gold," "silver," and "platinum-group metals" are published.

- The price of platinum is likely to rise in the short-term in response to increased use in fuel cell vehicles. However, the price is expected to return to its long-term mean (\$550 per ounce) once supply catches up with demand.

In summary, the DOE study concludes that the availability of platinum at a stable price should not be a barrier to fuel cell vehicle commercialization. Platinum is the catalyst that is necessary for low-temperature fuel cells of the type being developed for transportation and other uses (U.S. Department of Energy, 2003).

On February 5, 2004, the Defense National Stockpile Center (DNSC) announced the aggregated January 2004 PGM sales results under basic ordering agreement DLA-PGM-002. During January, DNSC sold Mitsui & Co., New York, NY, 62.2 kg of

palladium for an overall value of approximately \$245,000 (Defense National Stockpile Center, 2004).

References Cited

- Defense National Stockpile Center, 2004, Stockpile announces PGM BOA sales for January 2004: Fort Belvoir, VA, Defense National Stockpile Center news release, February 5, 1 p.
- Mining Journal, 2004, North American Platinum output rises: Mining Journal, January 9, p. 4.
- Stillwater Mining Company, 2004, Stillwater Mining reports unaudited 2003 fourth quarter and year-end results: Columbus, MT, Stillwater Mining Company news release, February 26, 20 p.
- U.S. Department of Energy, 2003, Platinum availability and economics for PEMFC commercialization: U.S. Department of Energy, December, 100 p.

TABLE 1
 PLATINUM-GROUP METALS PRICES¹

(Dollars per troy ounce)

| | Platinum | Palladium | Rhodium | Iridium | Ruthenium |
|-----------|--------------------|--------------------|-------------------|---------|---------------|
| 2003: | | | | | |
| Low/date | 454.00 February 1 | 225.00 December 23 | NA | NA | NA |
| High/date | 610.00 December 17 | 439.00 January 3 | NA | NA | NA |
| Average | 542.56 | 339.68 | NA | NA | NA |
| 2004: | | | | | |
| January: | | | | | |
| Low/date | 606.00/3 | 239.00/2 and 3 | 500.00/5 and 6 | 87.00 | 41.00/5 and 6 |
| High/date | 675.00/31 | 273.00/23 | 520.00/16, 19, 20 | 87.00 | 43.00 |
| Average | 633.09 | 258.41 | 513.75 | 87.00 | 42.80 |

NA Not available.

¹Quotes from Engelhard Industries.

Source: Platts Metals Week.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM METAL, BY COUNTRY¹

(Kilograms metal content, unless otherwise specified)

| Period and country | Platinum grain and nuggets | | Platinum sponge | | Other unwrought platinum | | Platinum, other | | Platinum waste and scrap | | Platinum coins | |
|-----------------------------|----------------------------|-------------------|-----------------|-------------------|--------------------------|-------------------|-----------------|-------------------|--------------------------|-------------------|----------------|-------------------|
| | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) |
| 2002 | 1,910 | \$34,000 | 72,600 | \$1,170,000 | 3,490 | \$53,700 | 4,950 | \$78,700 | 77,500 | \$61,400 | 20 | \$417 |
| 2003: | | | | | | | | | | | | |
| October | 121 | 2,340 | 6,590 | 145,000 | 957 | 21,300 | 308 | 5,580 | 4,610 | 19,000 | -- | -- |
| November | 2 | 46 | 2,770 | 63,600 | 282 | 6,100 | 180 | 3,250 | 27,900 | 4,900 | (2) | 2 |
| December: | | | | | | | | | | | | |
| Belgium | -- | -- | 134 | 3,520 | -- | -- | -- | -- | -- | -- | -- | -- |
| Canada ³ | 2 | 39 | -- | -- | -- | -- | 25 | 536 | 222 | 824 | 7 | 176 |
| China | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 32 |
| Colombia | -- | -- | -- | -- | 23 | 594 | 15 | 306 | 7 | 98 | -- | -- |
| France | -- | -- | -- | -- | -- | -- | (2) | 6 | 53,100 | 321 | -- | -- |
| Germany ³ | -- | -- | 424 | 11,400 | 37 | 974 | 300 | 4,740 | 136,000 | 2,450 | -- | -- |
| Israel | -- | -- | -- | -- | 131 | 2,380 | -- | -- | -- | -- | -- | -- |
| Italy | -- | -- | 170 | 4,430 | -- | -- | -- | -- | -- | -- | -- | -- |
| Japan ³ | -- | -- | 12 | 307 | 18 | 312 | -- | -- | 46 | 629 | -- | -- |
| Jordan | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 67 | -- | -- |
| Korea, Republic of | -- | -- | -- | -- | -- | -- | 2 | 51 | 39,800 | 356 | -- | -- |
| Malaysia | -- | -- | -- | -- | -- | -- | -- | -- | 1 | 10 | -- | -- |
| Mexico | -- | -- | -- | -- | -- | -- | -- | -- | 23 | 596 | -- | -- |
| Netherlands ³ | -- | -- | -- | -- | -- | -- | 3 | 23 | -- | -- | -- | -- |
| Nicaragua | -- | -- | -- | -- | -- | -- | -- | -- | 6 | 159 | -- | -- |
| Norway | -- | -- | 24 | 587 | -- | -- | -- | -- | -- | -- | -- | -- |
| Philippines | -- | -- | -- | -- | -- | -- | 3 | 60 | 1 | 20 | -- | -- |
| Russia | 191 | 4,900 | 506 | 12,800 | 570 | 11,500 | -- | -- | -- | -- | -- | -- |
| Singapore | -- | -- | -- | -- | -- | -- | (2) | 9 | -- | -- | -- | -- |
| South Africa | -- | -- | 2,850 | 66,900 | -- | -- | 15 | 363 | -- | -- | -- | -- |
| Switzerland ³ | -- | -- | 36 | 931 | -- | -- | 9 | 123 | -- | -- | -- | -- |
| United Kingdom ³ | -- | -- | 964 | 24,600 | 1 | 13 | 12 | 271 | 148,000 | 3,110 | -- | -- |
| Total | 193 | 4,940 | 5,130 | 125,000 | 780 | 15,800 | 384 | 6,490 | 377,000 | 8,640 | 8 | 208 |
| Year to date | 849 | 18,600 | 69,700 | 1,480,000 | 7,210 | 143,000 | 4,990 | 89,700 | 558,000 | 88,100 | 16 | 426 |

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than 1/2 unit.

³All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM-GROUP METALS, BY COUNTRY¹

(Kilograms metal content, unless otherwise specified)

| Period and country | Unwrought palladium | | Palladium, other | | Iridium ² | | Unwrought osmium | | Unwrought ruthenium | | Rhodium ³ | |
|-----------------------------|---------------------|-------------------|------------------|-------------------|----------------------|-------------------|------------------|-------------------|---------------------|-------------------|----------------------|-------------------|
| | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) | Quantity | Value (thousands) |
| 2002 | 94,600 | \$968,000 | 22,000 | \$189,000 | 2,100 | \$20,100 | 36 | \$294 | 9,890 | \$21,400 | 8,630 | \$288,000 |
| 2003: | | | | | | | | | | | | |
| October | 7,160 | 47,400 | 928 | 6,300 | 136 | 292 | 40 | 330 | 1,030 | 1,050 | 820 | 13,200 |
| November | 7,400 | 45,200 | 1,430 | 10,500 | 204 | 377 | -- | -- | 1,270 | 1,520 | 576 | 9,500 |
| December: | | | | | | | | | | | | |
| Belgium | 278 | 1,790 | 15 | 98 | -- | -- | -- | -- | -- | -- | 105 | 1,700 |
| Canada | 194 | 1,740 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| China | 50 | 313 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Germany ⁴ | 83 | 530 | 225 | 1,750 | -- | -- | -- | -- | 78 | 85 | 25 | 390 |
| Italy | (5) | 2 | 51 | 331 | 2 | 15 | -- | -- | -- | -- | -- | -- |
| Japan | 221 | 894 | 20 | 70 | -- | -- | -- | -- | -- | -- | 10 | 243 |
| Norway | 628 | 3,790 | -- | -- | -- | -- | -- | -- | -- | -- | 16 | 249 |
| Russia | 3,760 | 22,800 | 367 | 2,890 | -- | -- | -- | -- | 114 | 125 | 61 | 922 |
| South Africa ⁴ | 3,620 | 21,700 | 260 | 1,800 | 120 | 244 | -- | -- | 910 | 986 | 866 | 13,700 |
| Switzerland | -- | -- | 216 | 1,390 | -- | -- | -- | -- | -- | -- | -- | -- |
| United Kingdom ⁴ | 149 | 895 | 295 | 1,980 | 194 | 631 | -- | -- | -- | -- | 203 | 3,300 |
| Total | 8,980 | 54,400 | 1,450 | 10,300 | 316 | 890 | -- | -- | 1,100 | 1,200 | 1,290 | 20,500 |
| Year to date | 83,500 | 518,000 | 21,000 | 145,000 | 2,200 | 6,090 | 53 | 430 | 15,900 | 16,700 | 12,000 | 202,000 |

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Unwrought and other forms of iridium.

³Unwrought and other forms of rhodium.

⁴All or part of these data have been referred to the U.S. Census Bureau for verification.

⁵Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 4
U.S. EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY¹

(Kilograms of metal content, unless otherwise specified)

| Period and country | Platinum ² | | Platinum waste and scrap | | Palladium ² | | Iridium, osmium, and ruthenium ^{2,3} | | Rhodium ² | |
|---------------------------------|-----------------------|-------------|--------------------------|-------------|------------------------|-------------|---|-------------|----------------------|-------------|
| | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value | Quantity | Value |
| | | (thousands) | | (thousands) | | (thousands) | | (thousands) | | (thousands) |
| 2002 | 27,800 | \$331,000 | 17,700 | \$247,000 | 42,700 | \$350,000 | 1,990 | \$26,300 | 349 | \$12,500 |
| 2003: | | | | | | | | | | |
| October | 1,810 | 35,300 | 19,300 ^r | 31,500 | 2,230 | 11,600 | 49 | 622 | 21 | 383 |
| November | 1,430 | 27,200 | 7,590 ^r | 31,000 | 1,570 | 6,690 | 130 | 1,460 | 68 | 1,780 |
| December: | | | | | | | | | | |
| Australia ⁴ | 1 | 16 | -- | -- | 32 | 133 | (5) | 4 | -- | -- |
| Austria | 1 | 8 | -- | -- | -- | -- | -- | -- | -- | -- |
| Brazil ⁴ | -- | -- | -- | -- | 3 | 6 | -- | -- | -- | -- |
| Canada ⁴ | 87 | 1,370 | 434 | 1,740 | 252 | 1,820 | -- | -- | (5) | 34 |
| Cayman Islands ⁴ | -- | -- | -- | -- | -- | -- | -- | -- | (5) | 5 |
| China ⁴ | (5) | 5 | 247 | 62 | 36 | 262 | 4 | 123 | -- | -- |
| Czech Republic ⁴ | -- | -- | -- | -- | 3 | 6 | -- | -- | -- | -- |
| Denmark | -- | -- | -- | -- | 7 | 57 | -- | -- | -- | -- |
| France ⁴ | 8 | 140 | -- | -- | 43 | 262 | 3 | 63 | -- | -- |
| Germany ⁴ | 180 | 2,440 | 5 | 160 | 200 | 668 | -- | -- | -- | -- |
| Hong Kong ⁴ | 6 | 48 | -- | -- | 210 | 567 | 16 | 378 | 47 | 777 |
| Iceland ⁴ | -- | -- | -- | -- | 1 | 3 | -- | -- | -- | -- |
| India ⁴ | 1 | 9 | -- | -- | -- | -- | -- | -- | (5) | 20 |
| Ireland ⁴ | 4 | 68 | -- | -- | 2 | 14 | -- | -- | (5) | 39 |
| Israel | (5) | 5 | -- | -- | 3 | 25 | -- | -- | -- | -- |
| Italy | -- | -- | -- | -- | 3 | 19 | -- | -- | -- | -- |
| Japan ⁴ | 231 | 5,930 | 147 | 3,050 | 85 | 436 | -- | -- | 44 | 918 |
| Korea, Republic of ⁴ | 2 | 33 | -- | -- | 17 | 50 | -- | -- | -- | -- |
| Liechtenstein ⁴ | -- | -- | -- | -- | 1 | 14 | -- | -- | -- | -- |
| Malaysia | 1 | 10 | -- | -- | -- | -- | -- | -- | -- | -- |
| Mexico ⁴ | 3 | 39 | -- | -- | 4 | 12 | (5) | 3 | 1 | 157 |
| Netherlands ⁴ | 3 | 41 | -- | -- | 169 | 384 | -- | -- | -- | -- |
| New Zealand | -- | -- | -- | -- | 5 | 39 | -- | -- | -- | -- |
| Norway ⁴ | (5) | 9 | -- | -- | 10 | 110 | (5) | 6 | -- | -- |
| Philippines | 1 | 21 | -- | -- | -- | -- | -- | -- | -- | -- |
| Romania | (5) | 5 | -- | -- | -- | -- | -- | -- | -- | -- |
| Saudi Arabia | -- | -- | -- | -- | 2 | 11 | -- | -- | -- | -- |
| Singapore ⁴ | (5) | 3 | -- | -- | 4 | 29 | 13 | 70 | (5) | 62 |
| South Africa ⁴ | (5) | 4 | -- | -- | -- | -- | -- | -- | -- | -- |
| Spain | 1 | 13 | -- | -- | 7 | 59 | -- | -- | -- | -- |
| Suriname | 1 | 20 | -- | -- | -- | -- | -- | -- | -- | -- |
| Sweden | 4 | 56 | -- | -- | -- | -- | -- | -- | -- | -- |
| Switzerland ⁴ | 4 | 47 | 1,710 | 14,500 | 760 | 4,610 | -- | -- | -- | -- |
| Taiwan ⁴ | 13 | 197 | -- | -- | 444 | 1,190 | -- | -- | 1 | 76 |
| Thailand ⁴ | 1 | 12 | -- | -- | 11 | 45 | -- | -- | (5) | 9 |
| Turkey | -- | -- | -- | -- | -- | -- | 1 | 7 | -- | -- |
| United Kingdom ⁴ | 160 | 2,330 | 5,220 | 23,700 | 388 | 1,460 | 31 | 381 | (5) | 44 |
| Total | 712 | 12,900 | 7,760 | 43,200 | 2,700 | 12,300 | 68 | 1,040 | 93 | 2,140 |
| Year to date | 22,200 | 345,000 | 143,000 | 377,000 | 22,300 | 110,000 | 989 | 7,850 | 479 | 15,100 |

^rRevised. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Unwrought and other forms.

³Gross weight.

⁴All or part of these data have been referred to the U.S. Census Bureau for verification.

⁵Less than 1/2 unit.

Source: U.S. Census Bureau.