

# Mineral Industry Surveys

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## PLATINUM-GROUP METALS IN APRIL 2008

According to Platts Metals Week, the average April prices of platinum, palladium, and rhodium decreased by about 3%, 8%, and 2%, respectively, as compared with average prices in March. The iridium price has held steady at \$450 per troy ounce since February 13, 2007. The average price of ruthenium decreased by 6% in April as compared with that in March. Prices of platinum and palladium were extremely volatile throughout the month. Analysts attributed the volatility to a variety of factors such as supply concerns as well as changing news on the world economic front, including the weakening of the dollar and rise in oil prices. The news that silver might be used as a less expensive substitute for platinum in some types of autocatalysts sent the platinum price tumbling briefly (Pavliwa, 2008). The metal prices were also affected by varying news reports regarding the status of the continuing power crisis in South Africa. News of a partial easing of the power shortage resulted in brief price drops, whereas other news of continuing power problems and resulting production shortfalls resulted in price jumps. Although the average price of rhodium fell in April, the overall trend in the rhodium price, from the beginning to the end of the month, was steadily upward. In contrast, the trend in the ruthenium price, from the beginning to the end of the month, was downward. Both platinum and palladium prices showed an overall trend of low prices at the beginning and end of the month and higher prices mid-month.

The power crisis in South Africa continued to cause problems for the mining industry. Eskom Holdings, Ltd., the state-owned power company, was unable to provide enough electricity to meet the country's needs. Mining companies were still without full power, operating at 90% to 95% of normal supply levels, and were in negotiations with Eskom to increase power supplies. Eskom called for a new tariff to encourage energy efficiency; in addition, the power company announced it may resort to reducing energy exports to neighboring countries (Hill, 2008b). Impala Platinum Holdings Ltd. (Johannesburg, South Africa) announced that it may not be able to proceed with its planned mining project at Leeuwkop if Eskom cannot guarantee sufficient power for its full operation, which has a production estimate of 4,980 kg/yr

of platinum (Kruger, 2008). Aquarius Platinum Ltd. (South Perth, Australia) was in negotiations for a new power supply contract with a utility company in Mozambique. Some mining companies announced plans to generate at least some of their own power, particularly for new projects. Eastern Platinum Ltd. (Vancouver, British Columbia, Canada) planned to purchase four diesel power generators in order to continue development of its Crocodile River Mine (Johnson Matthey plc, 2008b). Eastern Platinum also announced the start of trial underground mining at its Spitzkop project as part of an economic evaluation, and further announced a production potential of 6,200 kilograms per year (kg/yr) of platinum, palladium, rhodium and gold, with a mine life of more than 20 years (Platts Metals Week, 2008). The world's three leading platinum producers, all in South Africa, experienced drops in production for the first quarter of 2008, largely as a result of the continuing power problems. Production for the first quarter dropped by 24% for Anglo American Platinum Corporation Ltd. (Johannesburg, South Africa), by 19% for Aquarius Platinum Ltd., and by nearly 22% for Lonmin Plc (London, United Kingdom). After 4 years of delays, Anglo Platinum was granted new order mining rights by the South Africa's Department of Minerals and Energy by meeting the requirements of the Mining Charter and contributing to black economic empowerment (Johnson Matthey plc, 2008a).

Problems for the platinum mining industry also occurred in Zimbabwe, which contains the world's second ranked platinum deposits after South Africa. A disputed presidential election that took place on March 29 led to a political crisis. Several mining companies put their expansion plans on hold pending resolution of the political situation. Despite the political tensions, China has shown interest in developing platinum deposits in Zimbabwe (Dixon, 2008). In addition, Anglo Platinum announced that it would proceed with its planned operations in Zimbabwe at the Unki Mine, where production is scheduled to begin in 2008 and is expected to reach 120 kilograms per month of ore by the end of the fourth quarter of 2010. Impala Platinum announced plans to expand its Mimoso and Zimplats operations in Zimbabwe, which would increase platinum output to an estimated 8,090 kg/yr by

2010, an increase of roughly 3,110 kg/yr (Karombo, 2008). Central African Mining & Exploration Co. (London, United Kingdom) agreed to buy platinum properties in Zimbabwe formerly owned by Anglo Platinum and predicted production of 3,730 to 4,670 kg/yr in 18 months (Hill, 2008a).

MMC Norilsk Nickel (Moscow, Russia) announced that its platinum production fell by roughly 18% and palladium production fell by about 17% in the first quarter compared with those in the first quarter of last year. The company attributed the drop to extraordinarily poor weather conditions and delays in shipment of platinum-group-metal ore concentrates to the refinery (Johnson Matthey plc, 2008c).

A new study has suggested that fuel-cell powered automobiles are the only solution to effectively reduce global warming during this century (Abrams, 2008). Fuel cells, some of which use platinum-group metals as catalysts, generate electricity by chemical reaction and are considered free of harmful emissions. The United Kingdom's first hydrogen fuel station opened in April at Birmingham University, which is conducting trials with a fleet of five fuel-cell vehicles. Plans are underway for another 3 hydrogen stations in London and at least 12 more stations nationwide by 2010, in preparation for commercial production of cars powered by fuel cells (Webster, 2008).

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TABLE 1  
PLATINUM-GROUP METALS PRICES<sup>1</sup>

(Dollars per troy ounce)

	Platinum	Palladium	Rhodium	Iridium	Ruthenium
<b>2007:</b>					
Low/date	1,122.00 Jan. 8	322.00 Aug. 22	5,550.00 Jan. <sup>2</sup>	400.00 Jan. and Feb. <sup>2</sup>	375.00 Jul. <sup>2</sup>
High/date	1,547.00 Dec. 27	385.00 Apr. 20	6,850.00 Dec. <sup>2</sup>	450.00 Feb.—Dec. <sup>2</sup>	870.00 Feb. <sup>2</sup>
Average	1,308.40	357.34	6,203.09	444.43	573.74
<b>2008:</b>					
<b>March:</b>					
Low/date	1,840.00/20	435.00/20	9,000.00 <sup>2</sup>	450.00 <sup>2</sup>	425.00 <sup>2</sup>
High/date	2,275.00/4	585.00/4	9,425.00 <sup>2</sup>	450.00 <sup>2</sup>	440.00 <sup>2</sup>
Average	2,043.65	490.35	9,244.00	450.00	436.25
<b>April:</b>					
Low/date	1,895.00/01	423.00/30	8,925.00 <sup>2</sup>	450.00 <sup>2</sup>	390.00 <sup>2</sup>
High/date	2,050.00/17	472.00/11	9,175.00/30	450.00 <sup>2</sup>	425.00 <sup>2</sup>
Average	1,991.32	449.05	9,068.18	450.00	408.18
<b>Year-to-date:</b>					
Low/date	1,534.00 Jan. 7	368.00 Jan. 22	6,850.00 Jan. 2	450.00 Jan.—Apr. <sup>2</sup>	390.00 Apr. <sup>2</sup>
High/date	2,275.00 Mar. 4	585.00 Mar. 4	9,425.00 Mar. <sup>2</sup>	450.00 Jan.—Apr. <sup>2</sup>	440.00 Feb. and Mar. <sup>2</sup>
Average	1,906.46	447.63	8,477.52	450.00	422.11

<sup>1</sup>Quotes from Engelhard Industries.

<sup>2</sup>Occured multiple days in month(s) listed.

Source: Platts Metals Week.

TABLE 2  
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM METAL, BY COUNTRY<sup>1</sup>

(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	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		(thousands)		(thousands)		(thousands)		(thousands)		(thousands)		(thousands)
2007	621	\$20,100	65,900	\$2,620,000	3,940	\$145,000	10,200	\$330,000	206,000	\$504,000	58	\$964
2008:												
January	39	774	2,780	135,000	128	5,190	737	25,200	11,700	37,700	(2)	8
February	49	1,500	6,980	375,000	541	32,100	862	44,600	10,200	46,300	1	281
March:												
Australia	--	--	--	--	--	--	264	16,000	--	--	2 <sup>3</sup>	39
Belgium	--	--	184	8,950	27	1,840	--	--	--	--	--	--
Bolivia	--	--	--	--	--	--	--	--	1,860 <sup>3</sup>	128	--	--
Brazil	--	--	--	--	--	--	(2)	7	3,170 <sup>3</sup>	2,160	--	--
Canada	1	27	--	--	--	--	25	1,490	64 <sup>3</sup>	6,950	1	50
China	--	--	--	--	--	--	--	--	40 <sup>3</sup>	750	--	--
Colombia	--	--	--	--	24	1,080	--	--	55 <sup>3</sup>	1,010	--	--
Czech Republic	--	--	--	--	--	--	--	--	28 <sup>3</sup>	489	--	--
Germany	80	2,820	225	14,800	74	4,450	260 <sup>3</sup>	6,590	137 <sup>3</sup>	13,400	--	--
Greece	--	--	--	--	--	--	--	--	2	100	--	--
Hong Kong	--	--	--	--	--	--	(2)	4	23	1,500	--	--
India	(2)	22	--	--	--	--	(2) <sup>3</sup>	5	--	--	--	--
Israel	--	--	--	--	--	--	--	--	3	165	1 <sup>3</sup>	4
Italy	--	--	114	4,470	(2) <sup>3</sup>	6	113	7,720	--	--	--	--
Japan	--	--	--	--	1 <sup>3</sup>	10	(2)	33	--	--	--	--
Jordan	--	--	--	--	--	--	--	--	187 <sup>3</sup>	69	--	--
Korea, Republic of	--	--	--	--	--	--	--	--	137 <sup>3</sup>	3,000	--	--
Mexico	--	--	--	--	5	268	14	722	22	866	--	--
Norway	--	--	47	3,160	--	--	--	--	--	--	--	--
Panama	--	--	--	--	--	--	--	--	2 <sup>3</sup>	20	--	--
Philippines	--	--	--	--	--	--	--	--	9 <sup>3</sup>	240	--	--
Russia	--	--	105	6,140	--	--	--	--	--	--	--	--
South Africa	--	--	2,900	155,000	(2) <sup>3</sup>	8	89	5,790	--	--	--	--
Switzerland	--	--	55	3,710	--	--	3 <sup>3</sup>	102	--	--	--	--
United Kingdom	--	--	778	51,900	1	52	45	2,720	--	--	--	--
Venezuela	--	--	--	--	--	--	--	--	1	51	--	--
Total	81	2,870	4,410	248,000	133	7,710	815	41,200	5,740	30,900	3	93
Year to date	169	5,150	14,200	759,000	802	45,000	2,410	111,000	27,600	115,000	5	382

-- Zero.

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

<sup>2</sup>Less than ½ unit.

<sup>3</sup>All 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 COUNTRY<sup>1</sup>

(Kilograms metal content, unless otherwise specified)

Period and country	Unwrought palladium		Palladium, other		Iridium <sup>2</sup>		Osmium <sup>2</sup>		Ruthenium <sup>2</sup>		Rhodium <sup>2</sup>	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2007	101,000	\$1,120,000	11,600	\$129,000	3,410	\$41,900	23	\$192	48,700	\$655,000	16,600	\$2,650,000
2008:												
January	11,500	135,000	1,010	13,000	154	2,260	4	46	2,380	25,500	1,400	212,000
February	9,870	125,000	1,080	17,800	189	2,820	--	--	4,520	53,900	1,140	239,000
March:												
Belgium	446	7,230	--	--	--	--	--	--	--	--	93	28,200
Canada	78 <sup>3</sup>	1,870	106 <sup>3</sup>	2,690	--	--	--	--	--	--	--	--
Colombia	--	--	--	--	--	--	--	--	1	16	--	--
Estonia	--	--	--	--	--	--	--	--	627	8,860	--	--
Germany	110	1,640	7	106	182 <sup>3</sup>	2,670	--	--	1,150	11,800	48 <sup>3</sup>	15,000
Italy	242	4,170	3	38	--	--	--	--	--	--	39	11,600
Japan	220 <sup>3</sup>	1,880	47 <sup>3</sup>	74	--	--	--	--	25	249	--	--
Norway	373	5,630	--	--	--	--	--	--	--	--	31 <sup>3</sup>	470
Russia	5,090	75,700	320 <sup>3</sup>	9,560	--	--	--	--	--	--	116	33,100
South Africa	1,310	19,600	--	--	120	1,810	--	--	2,410	29,600	771 <sup>3</sup>	135,000
Switzerland	61	872	37	703	--	--	--	--	--	--	--	--
United Kingdom	193	2,790	4 <sup>3</sup>	112	53	819	--	--	--	--	252 <sup>3</sup>	72,500
Total	8,120	121,000	524	13,300	356	5,300	--	--	4,210	50,600	1,350	296,000
Year to date	29,500	382,000	2,620	44,100	699	10,400	4	46	11,100	130,000	3,880	746,000

-- Zero.

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

<sup>2</sup>Unwrought and other forms.

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

Source: U.S. Census Bureau.

TABLE 4  
U.S. EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY<sup>1</sup>

(Kilograms of metal content, unless otherwise specified)

Period and country	Platinum <sup>2</sup>		Platinum waste and scrap		Palladium <sup>2</sup>		Iridium, osmium, and ruthenium <sup>2,3</sup>		Rhodium <sup>2</sup>	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2007	28,900	\$763,000	54,400	\$924,000	41,800	\$298,000	8,190	\$145,000	2,210	\$401,000
2008:										
January	431	16,500	5,390	94,900	2,800	21,100	321	3,420	316	30,300
February:	1,640	72,000	6,370	108,000	2,980	25,600	158	2,260	320	48,500
March:										
Australia	1	72	--	--	47	581	(4)	5	--	--
Austria	7	234	--	--	--	--	--	--	--	--
Belgium	2 <sup>5</sup>	30	1,610 <sup>5</sup>	9,230	1	3	--	--	--	--
Brazil	17	742	--	--	14	203	--	--	8	2,250
Canada	52	1,840	92 <sup>5</sup>	2,770	409	5,620	1	6	1 <sup>5</sup>	215
China	20	787	(4)	16	131	2,130	10	148	50	15,000
Colombia	(4) <sup>5</sup>	6	--	--	6	103	--	--	--	--
Cyprus	5	351	--	--	--	--	--	--	--	--
Denmark	--	--	--	--	4 <sup>5</sup>	78	1	10	--	--
Egypt	3 <sup>5</sup>	34	--	--	--	--	--	--	--	--
France	3	49	--	--	56	508	--	--	--	--
Germany	140	4,860	2,850 <sup>5</sup>	27,200	275	1,740	18	258	--	--
Guatemala	--	--	--	--	--	--	--	--	1 <sup>5</sup>	46
Hong Kong	3 <sup>5</sup>	633	--	--	139	1,400	93	1,340	--	--
Hungary	--	--	--	--	11	68	--	--	--	--
India	15	1,220	--	--	29	201	1	18	1	151
Ireland	13	423	--	--	1 <sup>5</sup>	16	2	9	--	--
Israel	2 <sup>5</sup>	21	--	--	158 <sup>5</sup>	430	--	--	--	--
Italy	3 <sup>5</sup>	193	--	--	186	3,280	--	--	7 <sup>5</sup>	235
Japan	56 <sup>5</sup>	3,160	245	18,100	138	1,840	2	17	209 <sup>5</sup>	30,400
Korea, Republic of	8 <sup>5</sup>	187	--	--	133	559	1	6	--	--
Mexico	3 <sup>5</sup>	95	--	--	4	28	19	557	(4) <sup>5</sup>	25
New Zealand	(4) <sup>5</sup>	26	--	--	6	126	--	--	--	--
Norway	24 <sup>5</sup>	503	--	--	32	147	(4)	4	--	--
Poland	(4) <sup>5</sup>	31	--	--	2	24	--	--	--	--
Romania	(4) <sup>5</sup>	12	--	--	2	19	--	--	--	--
Russia	(4) <sup>5</sup>	12	--	--	--	--	--	--	--	--
Singapore	1	30	--	--	15	153	81	1,110	--	--
South Africa	--	--	3	208	5	33	--	--	--	--
Spain	(4)	13	--	--	9	114	--	--	--	--
Sweden	1	34	--	--	(4) <sup>5</sup>	9	--	--	--	--
Switzerland	9 <sup>5</sup>	215	--	--	25	418	2	31	--	--
Taiwan	8 <sup>5</sup>	317	--	--	156 <sup>5</sup>	428	126	2,020	112 <sup>5</sup>	2,130
Thailand	(4) <sup>5</sup>	166	--	--	33	253	--	--	--	--
United Kingdom	77	3,230	895 <sup>5</sup>	42,000	320	2,230	38	542	--	--
Other	1 <sup>5</sup>	136	--	6	8 <sup>5</sup>	165	--	--	--	25
Total	474	19,700	5,690	99,600	2,360	22,900	394	6,080	389	50,400
Year to date	2,540	108,000	17,500	302,000	8,150	69,600	873	11,800	1,030	129,000

-- Zero.

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

<sup>2</sup>Unwrought and other forms.

<sup>3</sup>Gross weight.

<sup>4</sup>Less than ½ unit.

<sup>5</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.