

# Mineral Industry Surveys

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## PLATINUM-GROUP METALS IN FEBRUARY 2023

Imports for consumption of platinum-group metals (PGMs), including waste and scrap, were 14,800 kilograms (kg) in February 2023, an increase of 5% compared with imports in January 2023, and a 12% decrease compared with imports in February 2022 (table 1). The leading import sources for PGMs into the United States in February 2023 were, in descending order of quantity, South Africa, Russia, and Germany (tables 3, 4).

In February 2023, exports of palladium more than doubled compared with those in January 2023; exports of rhodium decreased by 88%, by 42% for PGM scrap, and by 26% for platinum. The leading destinations for PGM exports were, in descending order of quantity, Switzerland, Germany, and Japan (tables 1, 5).

The Engelhard average February 2023 prices decreased by 10% for palladium, by 9% for platinum, by 5% for rhodium, by 4% for ruthenium, and were unchanged for iridium compared with the average prices in January 2023. Compared with average prices in February 2022, the February 2023 average price increased by 11% for iridium and decreased by 36% for rhodium, by 34% for palladium, by 12% for ruthenium, and by 8% for platinum (fig. 1; tables 1, 2).

## Industry News

Johnson Matthey (United Kingdom) and Plug Power Inc. announced a partnership to build a manufacturing facility for catalysts, membranes, and catalyst coated membranes (CCM) that are used in green hydrogen technologies. The CCM plant would be built in the United States and have an initial production capacity of 5 gigawatts, which would eventually scale up to 10 gigawatts. Production was expected to begin in 2025. Johnson Matthey would provide components for the membrane electrode assemblies (MEAs), which use PGMs; Plug Power Inc. would then utilize the MEAs in their fuel cells. Funding for the plant would draw from government incentive programs, such as the Inflation Reduction Act in the United States and the REPowerEU in Europe, as well as from the two companies (Johnson Matthey, 2023; Plug Power Inc., 2023).

The U.S. Patent and Trademark Office issued a patent to Florida International University (FIU) for battery technology

that uses palladium as a catalyst in carbon nanotubes. This was the fifth patent issued to FIU. All intellectual property developed by FIU, including patents, belongs to Lion Battery Technologies, Inc., which is a subsidiary of Platinum Group Metals (Canada) and Anglo American Platinum Ltd. (South Africa), through a sponsored research agreement (Platinum Group Metals, 2023; undated).

## References Cited

- Platinum Group Metals Ltd., 2023, Platinum Group Metals Ltd. reports second quarter results: Vancouver, British Columbia, Canada, and Johannesburg, South Africa, Platinum Group Metals Ltd. news release, April 12. (Accessed April 13, 2023, at <https://www.platinumgroupmetals.net/news/news-details/2023/Platinum-Group-Metals-Ltd.-Reports-Second-Quarter-Results/default.aspx>.)
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- Johnson Matthey, 2023, Plug Power and Johnson Matthey announce long-term strategic partnership to accelerate the hydrogen economy: London, United Kingdom, Johnson Matthey press release, January 31. (Accessed April 13, 2023, at <https://matthey.com/plug-power-and-johnson-matthey-announce-long-term-strategic-partnership>.)
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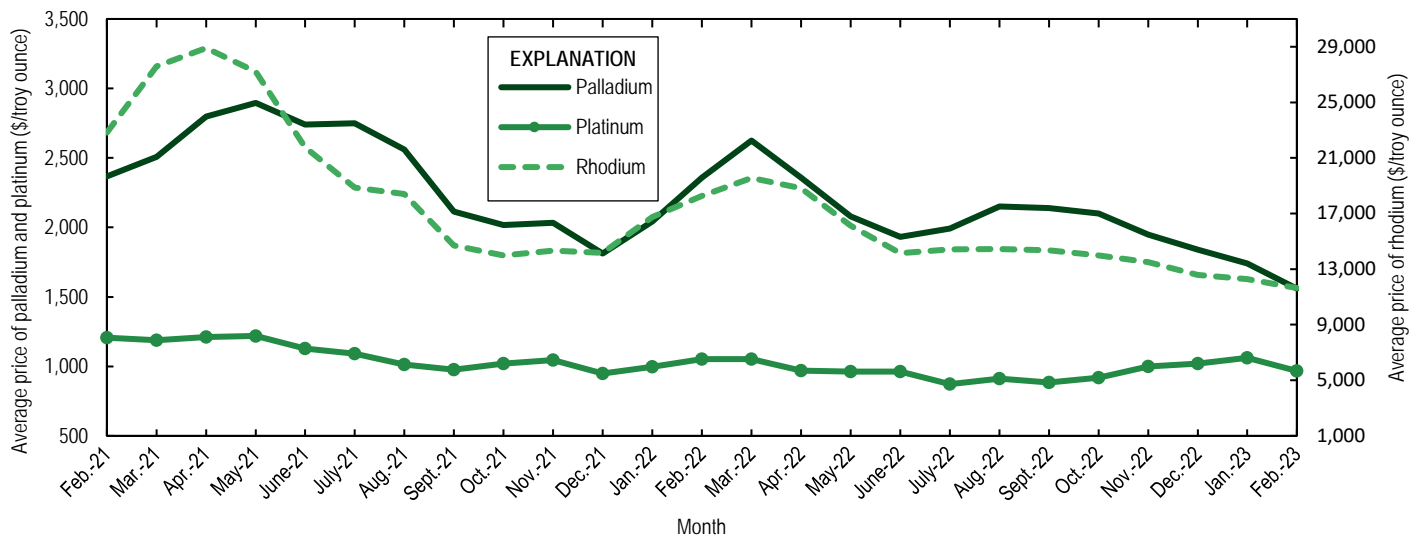


Figure 1. Engelhard unfabricated average monthly prices for palladium, platinum, and rhodium in dollars per troy ounce from February 2021 through February 2023. Source: S&P Global Platts Metals Week.

TABLE 1  
U.S. SALIENT PLATINUM-GROUP METALS STATISTICS<sup>1</sup>

(Kilograms metal content, unless otherwise specified)

	2022		2023		
	December	January– December	January	February	January– February
Mine production: <sup>2</sup>					
Palladium	841	10,095	841	841	1,682
Platinum	249	3,000	249	249	498
Total	1,090	13,095	1,090	1,090	2,180
Imports for consumption: <sup>3</sup>					
Palladium	5,786	65,193	5,562	5,538	11,100
Platinum	7,173	64,214	4,119	5,351	9,470
Iridium	165	1,611	76	214	290
Osmium	--	1	--	--	--
Rhodium	1,121	13,187	889	896	1,784
Ruthenium	1,590	13,289	809	880	1,689
Waste and scrap <sup>4</sup>	2,007	44,659	2,585	1,894	4,479
Total	17,841	202,153	14,039	14,772	28,812
Exports: <sup>3</sup>					
Palladium	1,885	42,226	1,330	3,170	4,500
Platinum	548	23,166	1,084	806	1,890
Iridium, osmium, ruthenium	28	905	22	9	31
Rhodium	52	677	58	7	65
Waste and scrap <sup>4</sup>	2,096	35,035	1,140	657	1,797
Total	4,608	102,009	3,634	4,649	8,282
Price, average (dollars per troy ounce): <sup>5</sup>					
Palladium	1,839.65	2,133.81	1,741.50	1,559.63	1,652.90
Platinum	1,021.10	966.54	1,061.20	967.95	1,015.77
Iridium	4,478.95	4,581.93	4,615.00	4,600.00	4,607.69
Rhodium	12,582.50	15,585.00	12,290.00	11,639.47	11,973.08
Ruthenium	512.50	577.02	484.00	466.05	475.26

-- Zero.

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

<sup>2</sup>Annual data are based on publicly available annual reports. Monthly and year-to-date data are estimated based on publicly reported quarterly data.

<sup>3</sup>Source: U.S. Census Bureau.

<sup>4</sup>Includes waste and scrap for all platinum-group elements. Previously included within platinum.

<sup>5</sup>Source: S&P Global Platts Metals Week.

TABLE 2  
PLATINUM-GROUP METALS PRICES<sup>1</sup>

(Dollars per troy ounce)

	Palladium	Platinum	Iridium	Rhodium	Ruthenium
2022:					
Low:					
Price	1,690.00	834.00	3,750.00	12,250.00	475.00
Date	Dec. 20	Jul. 14	Nov. <sup>2</sup> –Dec. <sup>2</sup>	Dec. <sup>2</sup>	Dec. 21
High:					
Price	3,050.00	1,155.00	5,000.00	20,250.00	625.00
Date	Mar. 8	Mar. 8	Mar.–Jul. <sup>2</sup>	Feb. <sup>2</sup>	Mar.–Jul. <sup>2</sup>
Price, average	2,133.81	966.54	4,581.93	15,585.00	577.02
2023:					
January:					
Low:					
Price	1,630.00	1,012.00	4,600.00	12,000.00	465.00
Date	Jan. 31	Jan. 31	Jan. <sup>2</sup>	Jan. 30 and 31	Jan. 31
High:					
Price	1,820.00	1,108.00	4,700.00	12,400.00	485.00
Date	Jan. 10	Jan. 11	Jan. 3–5	Jan. <sup>2</sup>	Jan. <sup>2</sup>
Price, average	1,741.50	1,061.20	4,615.00	12,290.00	484.00
February:					
Low:					
Price	1,410.00	920.00	4,600.00	9,600.00	465.00
Date	Feb. 24	Feb. 16 and 17	Feb. <sup>2</sup>	Feb. 28	Feb. <sup>2</sup>
High:					
Price	1,700.00	1,042.00	4,600.00	12,100.00	485.00
Date	Feb. 1	Feb. 2	Feb. <sup>2</sup>	Feb. <sup>2</sup>	Feb. 2
Price, average	1,559.63	967.95	4,600.00	11,639.47	466.05
January–February:					
Low:					
Price	1,410.00	920.00	4,600.00	9,600.00	465.00
Date	Feb. 24	Feb. 16 and 17	Jan.–Feb. <sup>2</sup>	Feb. 28	Jan.–Feb. <sup>2</sup>
High:					
Price	1,820.00	1,108.00	4,700.00	12,400.00	485.00
Date	Jan. 10	Jan. 11	Jan. 3–5	Jan. <sup>2</sup>	Jan. <sup>2</sup> and Feb. 2
Price, average	1,652.90	1,015.77	4,607.69	11,973.08	475.26

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

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

Source: S&P Global Platts Metals Week.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM METAL, BY COUNTRY OR LOCALITY<sup>1</sup>

(Kilograms metal content, unless otherwise specified)

Country or locality	Platinum grain and nuggets		Platinum sponge		Other unwrought platinum		Platinum, other		Platinum coins	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2022:										
December	23	\$773	4,758	\$150,033	73	\$2,615	2,305	\$87,348	13	\$450
January–December	1,303	41,601	47,856	1,501,064	2,348	145,580	12,065	528,914	642	21,024
2023:										
January	78	2,530	3,192	105,800	177	6,393	562	25,586	110	3,873
February:										
Austria	--	--	--	--	--	--	(2)	13	--	--
Belgium	--	--	342	11,454	--	--	--	--	--	--
Canada	14	466	--	--	--	--	31	1,110	36	1,162
China	--	--	--	--	--	--	--	--	1	23
Colombia	1	33	--	--	1	45	--	--	--	--
Costa Rica	--	--	--	--	--	--	110	5,317	--	--
Czechia	--	--	--	--	--	--	5	102	--	--
France	--	--	--	--	--	--	29	910	--	--
Germany	--	--	337	10,970	73	2,946	389	20,315	(2)	4
India	--	--	125	3,561	--	--	--	--	--	--
Ireland	(2)	9	--	--	--	--	(2)	3	--	--
Italy	--	--	654	21,275	--	--	--	--	--	--
Japan	--	--	--	--	12	357	26	854	--	--
Korea, Republic of	--	--	260	8,116	--	--	--	--	--	--
Mexico	--	--	--	--	--	--	1	11	--	--
Poland	--	--	--	--	--	--	2	67	--	--
Russia	61	1,939	200	6,745	--	--	--	--	--	--
Singapore	--	--	--	--	(2)	107	6	224	--	--
South Africa	--	--	1,687	54,288	--	--	3	98	--	--
Sweden	--	--	--	--	--	--	(2)	4	--	--
Switzerland	(2)	3	237	7,799	--	--	632	21,432	--	--
Taiwan	--	--	--	--	--	--	6	243	--	--
United Kingdom	--	--	60	1,761	--	--	9	393	2	60
Total	76	2,451	3,902	125,970	86	3,455	1,248	51,095	38	1,249
January–February	155	4,982	7,094	231,770	263	9,848	1,810	76,680	148	5,122

-- 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.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF PLATINUM-GROUP METALS, BY COUNTRY OR LOCALITY<sup>1</sup>

(Kilograms metal content, unless otherwise specified)

Country or locality	Palladium <sup>2</sup>		Iridium <sup>2</sup>		Osmium <sup>2</sup>		Rhodium <sup>2</sup>		Ruthenium <sup>2</sup>		Waste and scrap <sup>3</sup>	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2022:												
December	5,786	\$347,247	165	\$17,905	--	--	1,121	\$525,358	1,590	\$23,562	2,007	\$85,809
January–December	65,193	4,372,409	1,611	194,594	1	\$3	13,187	6,782,708	13,289	226,251	44,659	1,362,995
2023:												
January	5,562	314,386	76	10,117	--	--	889	368,559	809	11,933	2,585	63,118
February: <sup>4</sup>												
Belgium	525	30,656	--	--	--	--	95	36,148	--	--	--	--
Brazil	--	--	--	--	--	--	--	--	--	--	39	3,447
Canada	341	19,056	--	--	--	--	--	--	--	--	522	10,521
Colombia	--	--	--	--	--	--	--	--	--	--	49	1,078
France	--	--	--	--	--	--	--	--	--	--	134	1,768
Germany	73	4,399	56	8,836	--	--	225	105,312	272	4,009	92	3,003
Guatemala	--	--	--	--	--	--	--	--	--	--	86	2,791
Italy	234	13,107	2	335	--	--	74	28,970	(5)	4	104	3,394
Japan	363	17,590	20	2,232	--	--	(5)	3	10	129	--	--
Korea, Republic of	321	16,314	--	--	--	--	12	5,276	--	--	--	--
Mexico	85	1,345	--	--	--	--	--	--	--	--	251	9,189
Paraguay	--	--	--	--	--	--	--	--	--	--	18	571
Poland	--	--	--	--	--	--	--	--	--	--	145	21,713
Qatar	--	--	--	--	--	--	--	--	--	--	51	1,688
Russia	2,830	156,320	--	--	--	--	50	19,692	10	120	--	--
South Africa	719	40,779	112	14,672	--	--	439	168,300	588	7,883	--	--
Sweden	--	--	--	--	--	--	--	--	--	--	35	12,182
Switzerland	41	3,055	--	--	--	--	--	--	--	--	--	--
Taiwan	--	--	--	--	--	--	--	--	--	--	36	1,973
United Kingdom	4	338	23	3,654	--	--	1	353	--	--	260	8,500
Other	1	80	--	--	--	--	--	--	--	--	73	4,091
Total	5,538	303,039	214	29,729	--	--	896	364,055	880	12,145	1,894	85,909
January–February	11,100	617,426	290	39,846	--	--	1,784	732,613	1,689	24,078	4,479	149,027

-- 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>Includes waste and scrap for all platinum-group elements.

<sup>4</sup>The 20 countries and (or) localities with the greatest total platinum-group metal imports are listed. All others are included in the "Other" category.

<sup>5</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 5  
U.S. EXPORTS OF PLATINUM-GROUP METALS, BY COUNTRY OR LOCALITY<sup>1</sup>

(Kilograms metal content, unless otherwise specified)

Country or locality	Palladium <sup>2</sup>		Platinum <sup>2</sup>		Iridium, osmium and ruthenium <sup>2, 3</sup>		Rhodium <sup>2</sup>		Waste and scrap <sup>4</sup>	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
2022:										
December	1,885	\$116,112	548	\$26,360	28	\$3,999	52	\$23,766	2,096	\$156,582
January–December	42,226	2,765,517	23,166	884,736	905	36,458	677	354,663	35,035	2,989,196
2023:										
January	1,330	76,655	1,084	62,396	22	2,835	58	22,848	1,140	107,867
February: <sup>5</sup>										
Australia	2	134	13	631	1	112	--	--	--	--
Belgium	10	517	9	283	--	--	2	713	--	--
Brazil	7	407	3	931	--	--	--	--	--	--
Canada	513	27,108	37	1,261	--	--	(6)	37	102	3,466
China	15	929	85	4,600	(6)	25	2	1,107	--	--
Costa Rica	5	373	62	2,209	--	--	--	--	--	--
France	5	325	1	34	--	--	--	--	--	--
Germany	431	21,905	145	7,723	(6)	21	3	1,065	291	96,575
Hong Kong	5	315	3	394	--	--	--	--	48	2,148
India	3	160	6	1,548	--	--	--	--	--	--
Ireland	2	120	53	1,864	(6)	3	--	--	--	--
Israel	17	926	(6)	5	--	--	--	--	--	--
Italy	136	7,189	14	4,420	--	--	(6)	113	--	--
Japan	477	25,372	175	10,085	5	888	--	--	133	4,131
Korea, Republic of	610	33,954	16	1,074	--	--	(6)	17	--	--
Mexico	6	356	98	4,270	(6)	45	(6)	17	--	--
South Africa	--	--	--	--	--	--	--	--	7	687
Switzerland	858	45,283	(6)	9	--	--	--	--	32	1,034
Taiwan	7	449	(6)	12	--	--	--	--	--	--
United Kingdom	55	3,033	72	2,283	2	150	--	--	43	1,880
Other	6	374	13	2,332	1	107	--	--	--	--
Total	3,170	169,229	806	45,968	9	1,351	7	3,070	657	109,921
January–February	4,500	245,884	1,890	108,365	31	4,186	65	25,918	1,797	217,788

-- 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>Includes waste and scrap for all platinum-group elements. Previously categorized as "Platinum waste and scrap."

<sup>5</sup>The 20 countries and (or) localities with the greatest total platinum-group metal exports are listed. All others are included in the "Other" category.

<sup>6</sup>Less than ½ unit.

Source: U.S. Census Bureau.