PLATINUM-GROUP METALS STATISTICS
By Thomas D. Kelly and Henry E. Hilliard
[All values in metric tons (t) unless otherwise noted]
Last modification: April 26, 2003

Year	Primary production	Secondary production	Secondary production toll-refined	Imports	Exports	Apparent consumption	Reported consumption	Unit value ($/t)	Unit value (98$/t)	World production
1900	0.0124					2.56		201,000	3,900,000	6.62
1901	0.0438					2.65		629,000	12,000,000	9.85
1902	0.0029			2.74		2.74		725,000	14,000,000	9.33
1903	0.0034			2.89		2.89		712,000	13,000,000	7.03
1904	0.0062					2.91		669,000	12,000,000	9.03
1905	0.0099			2.92		2.93		744,000	14,000,000	6.24
1906	0.0448			4.29		4.33		883,000	16,000,000	6.59
1907	0.0111			2.31		2.32		1,160,000	20,000,000	9.65
1908	0.0233			1.58		1.60		778,000	14,000,000	8.00
1909	0.0209			3.71		3.73		802,000	15,000,000	8.45
1910	0.0240			3.81		3.83		960,000	17,000,000	8.89
1911	0.0195			3.87		3.89		1,260,000	22,000,000	9.74
1912	0.0313			3.41		3.45		1,320,000	22,000,000	9.77
1913	0.0150	1.27		3.67		3.69		1,370,000	22,600,000	8.31
1914	0.0177	1.33		2.33		2.35		1,250,000	20,400,000	8.11
1915	0.0231	1.37		2.14		2.16		1,290,000	20,800,000	4.45
1916	0.0221	1.49		1.98		2.01		1,870,000	28,000,000	2.80
1917	0.0188	2.25		1.11		1.13		2,660,000	33,900,000	2.59
1918	0.0201	1.42		1.77		1.79	3.58	2,930,000	31,600,000	1.96
1919	0.0212	1.91		2.12		2.14	4.81	3,190,000	30,100,000	2.11
1920	0.0215	1.80		3.13		3.15	4.39	3,390,000	27,600,000	2.30
1921	0.0304	1.43		2.44	0.125	2.34	5.48	2,220,000	20,200,000	1.84
1922	0.0314	1.45		3.42	0.060	3.39	5.65	2,630,000	25,500,000	2.17
1923	0.0189	1.49		3.32	0.054	3.28	5.88	3,160,000	30,100,000	2.56
1924	0.0104	1.69		3.46	0.222	3.25	5.07	3,180,000	30,300,000	3.56
1925	0.0107	1.35		3.91	0.615	3.31	5.35	3,380,000	31,600,000	3.23
1926	0.0089	1.44		4.19	0.419	3.78	5.26	3,210,000	29,400,000	4.42
1927	0.0048	1.65		4.63	0.668	3.96	4.60	2,680,000	25,000,000	4.64
1928	0.0164	1.74		4.21	0.349	3.87	5.77	2,220,000	21,100,000	4.31
1929	0.0248	1.33		4.82	0.125	4.72	5.88	1,890,000	18,000,000	4.84
1930	0.0164	1.47		4.33	0.056	4.29	3.65	1,350,000	13,200,000	4.75
1931	0.0275	1.36		4.03	0.075	3.98	3.68	876,000	9,390,000	8.94
1932	0.0334	1.01		1.74	0.689	1.09	2.58	813,000	9,680,000	6.53
1933	0.0394	1.29		5.04	0.778	4.30	3.32	782,000	9,800,000	6.77
1934	0.116	1.36		5.42	0.083	5.45	2.96	767,000	9,330,000	12.9
1935	0.282	1.84		5.11	0.163	5.23	3.85	828,000	9,860,000	12.1

PLATINUM-GROUP METALS STATISTICS
By Thomas D. Kelly and Henry E. Hilliard
[All values in metric tons (t) unless otherwise noted]
Last modification: April 26, 2003

Year	Primary production	Secondary production	Secondary production toll-refined	Imports	Exports	Apparent consumption	Reported consumption	Unit value ($/t)	Unit value (98$/t)	World production
1936	0.304	2.06		6.55	1.81	3.16	5.05	916,000	10,700,000	14.2
1937	0.336	2.25		6.44	1.94	3.23	5.27	1,150,000	13,000,000	14.8
1938	1.270	2.00		5.01	1.07	2.86	3.81	871,000	10,100,000	16.8
1939	1.010	1.97		9.54	1.57	8.98	3.92	1,040,000	12,200,000	16.9
1940	1.050	2.07		6.09	1.77	5.37	4.72	945,000	11,000,000	14.5
1941	0.816	1.60		9.64	0.586	9.87	6.00	741,000	8,220,000	14.9
1942	0.722	2.38		9.80	3.23	7.29	8.37	1,150,000	11,500,000	16.9
1943	0.845	3.16		11.3	0.102	12.0	10.9	971,000	9,160,000	19.6
1944	1.05	3.71		11.1	0.269	11.9	15.0	964,000	8,930,000	16.0
1945	0.826	2.99		11.9	0.766	12.0	13.4	971,000	8,830,000	30.0
1946	0.714	2.26		12.9	0.826	12.8	16.2	1,140,000	9,500,000	17.9
1947	0.430	2.71		9.61	0.993	9.04	14.0	1,230,000	8,980,000	15.6
1948	0.427	2.92		8.48	1.29	7.62	11.3	1,770,000	12,000,000	16.3
1949	0.772	2.60		6.79	1.92	5.64	10.7	1,750,000	12,000,000	17.9
1950	1.18	1.81		13.3	1.57	12.9	8.36	1,750,000	11,800,000	18.7
1951	1.15	1.66		18.7	2.45	17.4	14.3	1,940,000	12,100,000	21.0
1952	1.07	1.82		14.1	0.738	14.4	13.4	1,810,000	11,100,000	21.8
1953	0.811	2.02		19.7	0.801	19.7	13.5	2,000,000	12,200,000	24.1
1954	0.754	2.04		18.9	0.885	18.7	15.8	1,870,000	11,300,000	29.2
1955	0.721	2.00		31.4	0.901	31.2	17.3	1,530,000	9,330,000	33.9
1956	0.666	3.31		32.2	1.31	31.5	25.5	1,800,000	10,800,000	34.5
1957	0.576	2.72		21.2	1.26	20.5	25.8	1,690,000	9,830,000	41.1
1958	0.447	2.54		20.9	1.47	19.8	22.6	1,200,000	6,780,000	27.7
1959	0.482	4.23		31.0	0.977	30.5	20.9	1,190,000	6,650,000	32.8
1960	0.734	2.39	23.7	21.2	2.03	19.9	26.9	1,610,000	8,850,000	39.7
1961	1.35	2.67	21.8	27.5	1.92	26.9	23.3	1,340,000	7,320,000	41.8
1962	0.894	4.11	29.0	22.4	1.88	21.4	25.0	1,460,000	7,890,000	50.5
1963	1.55	3.64	29.0	31.2	1.96	30.8	26.1	1,610,000	8,560,000	63.4
1964	1.26	3.74	34.7	27.5	4.55	24.2	30.1	1,840,000	9,680,000	79.2
1965	1.09	3.28	37.1	36.3	3.21	34.2	33.0	1,900,000	9,840,000	92.3
1966	1.60	3.21		42.1	6.39	37.3	35.7	1,980,000	9,950,000	94.5
1967	0.509	11.4	62.7	41.1	8.70	32.9	50.0	2,240,000	10,900,000	98.8
1968	0.460	10.3	72.7	55.2	12.3	43.3	39.8	2,280,000	10,700,000	106
1969	0.680	11.6	69.9	38.1	15.6	23.2	38.5	2,460,000	10,900,000	107
1970	0.539	10.9	53.6	43.9	13.0	31.4	40.8	2,390,000	10,000,000	132
1971	0.561	8.65	45.2	40.5	12.6	28.5	39.9	2,310,000	9,300,000	127

PLATINUM-GROUP METALS STATISTICS
By Thomas D. Kelly and Henry E. Hilliard
[All values in metric tons (t) unless otherwise noted]
Last modification: April 26, 2003

Year	Primary production	Secondary production	Secondary production toll-refined	Imports	Exports	Apparent consumption	Reported consumption	Unit value ($/t)	Unit value (98$/t)	World production
1972	0.532	7.95	42.4	57.1	16.5	41.1	38.2	2,520,000	9,830,000	133
1973	0.621	8.27	32.3	77.9	19.5	59.0	47.2	3,460,000	12,700,000	163
1974	0.394	10.1	33.8	101	26.0	75.5	54.8	4,990,000	16,500,000	179
1975	0.588	8.40	36.6	56.6	20.5	36.7	59.7	4,820,000	14,600,000	178
1976	0.190	6.70	27.1	83.0	15.9	67.2	39.6	3,510,000	10,100,000	194
1977	0.172	6.07	31.3	78.1	13.3	65.0	48.6	3,500,000	9,410,000	203
1978	0.256	8.00	31.8	90.9	21.9	69.3	47.8	4,950,000	12,400,000	200
1979	0.218	9.61	33.9	108	28.0	93.7	68.1	7,770,000	17,400,000	202
1980	0.093	10.3	33.6	109	23.8	82.1	83.1	10,800,000	21,400,000	213
1981	0.218	12.2	37.0	88.6	26.9	75.1	66.3	9,030,000	16,200,000	216
1982	0.249	10.7	27.0	77.6	26.0	58.1	57.8	7,140,000	12,100,000	200
1983	0.187	9.43	31.0	100	38.2	87.5	56.7	7,520,000	12,300,000	203
1984	0.467	10.6	36.0	139	36.1	103	58.2	8,030,000	12,600,000	238
1985		8.04	32.3	124	27.6	105	66.1	8,270,000	12,500,000	247
1986		11.0	35.9	139	23.3	110	70.7	9,670,000	14,400,000	260
1987	3.11	5.12	44.9	118	22.0	95.5	64.7	10,500,000	15,100,000	271
1988	4.97	4.79	46.4	124	28.8	103	60.3	10,800,000	14,900,000	280
1989	6.28	3.93	46.3	113	38.1	101	71.0	12,200,000	16,000,000	282
1990	7.74	5.82	65.4	125	55.0	117	78.5	15,200,000	19,000,000	291
1991	7.78	4.81	67.5	126	39.6	112	77.5	13,900,000	16,600,000	287
1992	7.74	5.33	59.0	132	57.8	109	62.6	11,200,000	13,000,000	280
1993	8.83	4.84	61.0	153	78.5	123	66.8	8,560,000	9,660,000	276
1994	8.40			171	88.6	90.7	60.3	8,327,043	9,160,000	269
1995	6.85			221	50.6	177		7,201,766	7,700,000	326
1996	7.94			256	48.8	215		8,391,344	8,720,000	324
1997	11.0			258	81.2	188		8,455,645	8,590,000	333
1998	13.8			302	59.3	256		10,200,000	10,200,000	348
1999	12.7			338	71.8	279		10,500,000	10,300,000	376
2000	13.4			318	93.2	238		18,000,000	17,000,000	365

Platinum-Group Metals Worksheet Notes

Data Sources
The sources of data for the platinum-group metals (PGM) worksheet are the mineral statistics publications of the U.S. Bureau of Mines and the U.S. Geological Survey—Minerals Yearbook (MYB) and its predecessor, Mineral Resources of the United States (MR); Mineral Commodity Summaries (MCS); and Metal Prices in the United States through 1998 (MP98). The years of publication and corresponding years of data coverage are listed in the References section below. Blank cells in the worksheet indicate that data were either not available or were withheld because they are proprietary.

Primary Production
Primary production reports the palladium, platinum, and small amounts of the other PGM (iridium, osmium, rhodium, and ruthenium) recovered from placer production and byproduct production from gold and copper smelting for the years 1900–87 in the United States. In 1988, palladium and platinum production from the Stillwater Mine in Nye, MT, were added to the total reported primary production. For the years 1990–2000, primary production reports only the mine production of palladium and platinum at the Stillwater Mine. Data are withheld for 1985 and 1986. For the years 1900–83, data are recorded from the MR and MYB. For the years 1984–98, data are recorded from the MCS. For the years 1999–2000, data are recorded from the MYB.

Secondary Production
Secondary production reports the PGM recovered from scrap metal, sweeps, and other waste products. Substantial quantities of catalysts, spinnerets, and laboratory-ware are returned for refining or reworking. These metals are not included in secondary production. Data are recorded from the MR and MYB for the years 1913–93. Data were not available for the years 1900–12 and 1994–2000.

Secondary Production Toll-Refined
The secondary production toll-refined category reports the depleted catalysts, worn-out extrusion dies, spinnerets, laboratory ware, and other used equipment that are sent to a refiner and/or fabricator for reworking. A toll is charged for this service. Data are not available for the years 1900–59, 1966, and 1994–2000. Data are recorded from the MR and MYB.

Imports
Imports report the PGM in metal content imported for consumption into the United States. Data are recorded from the MR and MYB. Data are not available for the years 1900–01 and 1904.

Exports
Exports report the PGM in metal content exported from the United States. Data are recorded from the MR and MYB. Data are not available for the years 1900–10.

Apparent Consumption
For the years 1900–34, 1939–78, and 1994–2000, apparent consumption for PGM was estimated with the formula:

APPARENT CONSUMPTION = PRIMARY PRODUCTION + SECONDARY PRODUCTION + IMPORTS – EXPORTS.

For the years 1900–10, exports were assumed to be zero. For the years 1900–01, apparent consumption was extrapolated. For the year 1904, apparent consumption was interpolated. For the years 1935–38 and 1979–93, apparent consumption was recorded from the MYB.

Reported Consumption
Reported consumption is recorded from the MR and MYB for the years 1918–94. Reported consumption is PGM "sold to industry."

Unit Value ($/t)
Unit value of PGM reports the value of 1 metric ton (t) of PGM apparent consumption. For the years 1918–94, unit value is estimated by weight averaging the amount of each metal sold to industry (from the MR and MYB) with price series for the metals from MP98. For the years 1902–03 and 1905–17, unit value was estimated with the average value of imports. For the year 1900–01 and 1904, production value was used to estimate unit value. A complete weight average of all six PGM is possible for the years 1957–94, because the reported consumption is given for all six metals during this period. For the years 1938–56, the reported consumption is published for palladium, platinum, and other PGM. For the years 1918–37, the reported consumption is published for iridium, palladium, platinum, and other PGM. However, a graphical comparison of $/t for imports and $/t for the weight-averaged values demonstrates a close overlap. This is because in the earlier years (prior to 1957) palladium and platinum were the primary metals consumed. For the years 1900–01 and 1904, using the production value to estimate unit value for years when import value was not available is a good estimate for the same reason. A graphical comparison of $/t for production and $/t for imports demonstrates a close overlap. For the years 1994-97, unit value was estimated by weight averaging the amounts of refined metals (palladium, platinum, iridium, ruthenium and rhodium) imported with prices from the MYB. For the years 1998–2000, unit value was estimated with the value of imports. For the years 1994–97, unit value was not available.

Unit Value (98$/t)
The Consumer Price Index conversion factor, with 1998 as the base year, is used to adjust unit value in current U.S. dollars to the unit value in constant 1998 U.S. dollars.

World Production
World production of PGM is recorded from the MR and MYB for the years 1900-2000.

References
U.S. Bureau of Mines, 1927–34, Mineral Resources of the United States, 1924–31.
U.S. Bureau of Mines, 1933–96, Minerals Yearbook, 1932–94.
U.S. Bureau of Mines, 1978–95, Mineral Commodity Summaries, 1978–95.
U.S. Geological Survey, 1901–27, Mineral Resources of the United States, 1900–23.
U.S. Geological Survey, 1997–2000, Mineral Commodity Summaries, 1997–2000.
U.S. Geological Survey, 1997–2002, Minerals Yearbook, v. I, 1995–2000.
U.S. Geological Survey, 1999, Metal Prices in the United States through 1998.
U.S. Geological Survey and U.S. Bureau of Mines, 1996, Mineral Commodity Summaries, 1996.

For more information, please contact:

Henry E. Hilliard
USGS Platinum-Group Metals Commodity Specialist
(703) 648-4970
hhilliar@usgs.gov

Thomas D. Kelly
Minerals and Materials Analysis Section, USGS
(303) 236-8747 x 269
kellyt@usgs.gov