Vanadium

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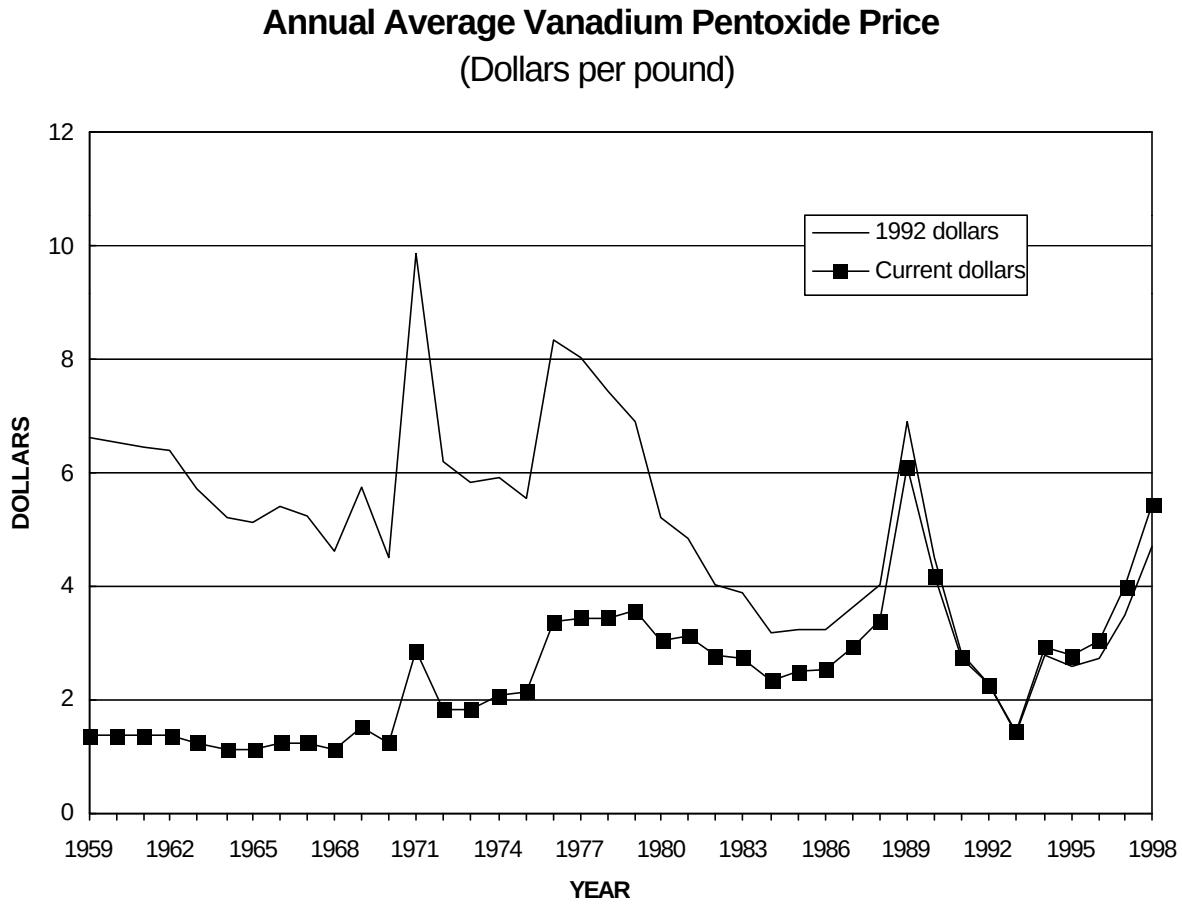

Significant events affecting vanadium prices since 1958

1988-89	Short supply owing to technical problems at some producers, and to strong demand from steel and aerospace industries
1993	Market oversupply all year; price fell despite increase in consumption
1997	Disposal of last vanadium pentoxide holdings in the U.S. National Defense Stockpile (NDS)

Vanadium was first described by Andres Manuel del Rio in 1801. He had isolated it from lead ores from Zimapan, Mexico (Busch, 1961, p. 18). At the start of the 20th century, vanadium remained little more than a chemical curiosity with no commercial value because of its rarity and high cost. The supply and cost restrictions were significantly altered in the early years of the 20th century with the discovery of rich vanadium deposits in several countries, including the United States. In 1905, the American Vanadium Co. was established to extract vanadium from ores discovered in Colorado (Kuck, 1985, p. 985). Commercial production began shortly thereafter.

Two main prices are associated with vanadium—one is for the ferroalloy ferrovanadium, and the other for vanadium pentoxide; prices for vanadium metal are not published. Because much of the world's ferrovanadium is made from vanadium pentoxide, the price for vanadium pentoxide has been used.

Owing in part to its relative scarcity and the absence of free market trading, the vanadium pentoxide price has historically

been a producer price. This has resulted in low volatility and relatively stable prices, showing a gradual upward trend, as can be seen in the graph above for the period from 1959 through 1988. Since the late 1980's, the vanadium pentoxide price appears to have become more volatile. This increased volatility is attributed to the availability of additional vanadium pentoxide supplies from such countries as China and Russia, sales of the remaining vanadium pentoxide from the NDS during the 1990's, and, to a very limited extent, the potential substitution of other metals for vanadium in certain alloys.

References Cited

Busch, P.M., 1961, Vanadium—A materials survey: U.S. Bureau of Mines Information Circular 8060, 95 p.

Kuck, P.H., 1985, Vanadium, *in* Mineral facts and problems: U.S. Bureau of Mines Bulletin 675, p. 895-915.

Annual Average Vanadium Pentoxide Price[1]
(Dollars per pound[2])

Year	Price	Year	Price	Year	Price	Year	Price
1959	1.38	1969	1.51	1979	3.57	1989	6.10
1960	1.38	1970	1.25	1980	3.07	1990	4.21
1961	1.38	1971	2.85	1981	3.14	1991	2.75
1962	1.38	1972	1.85	1982	2.77	1992	2.28
1963	1.25	1973	1.85	1983	2.75	1993	1.45
1964	1.15	1974	2.08	1984	2.36	1994	2.95
1965	1.15	1975	2.14	1985	2.50	1995	2.80
1966	1.25	1976	3.38	1986	2.53	1996	3.07
1967	1.25	1977	3.47	1987	2.95	1997	4.00
1968	1.15	1978	3.47	1988	3.40	1998	5.47

[1] Minimum 98% vanadium pentoxide anhydride.

[2] To convert to dollars per kilogram, multiply by 2.20462.

Source: Metal Bulletin (1959-98).