

APPENDIX B

CASE STUDIES

A. LONG-TERM PROGRAM FOR DISPOSAL OF GOVERNMENT STOCKPILES OF ALUMINUM

1. Introduction

The long-term program for the disposal of Government stockpiles of aluminum ingots has been unique in that it was the only such program established on an orderly, though somewhat flexible, schedule. As with other stockpile disposals, it has economic and political overtones. There were the usual caveats about the avoidance of adverse effects on the international interests of the United States; due regard to protection against avoidable financial loss by the United States; avoidance of adverse effects on domestic employment; and avoidance of partiality in labor disputes. As might have been expected, there were implications of attempts by the United States to influence prices.

In common with other stockpiled materials for which disposal plans were under consideration at the time of the aluminum program's initiation, the Federal Government recognized two factors of importance: (1) a desire to help reduce budget deficits by selling surplus materials; and (2) the supply and inflation problems to all materials, was the desire to reduce the balance of payments deficit by substituting domestic for imported aluminum. This case study discusses the industry position on the aluminum stockpile disposal program and the steps taken by the Federal Government in the disposal programs.

2. Purposes of the Aluminum Program

a. The Existing Aluminum Surplus—The aluminum disposal program was initiated in November 1965 after a series of discussions within the Government and between Govern-

ment and industry which began as early as 1963. The stockpile objective for aluminum had undergone wide fluctuations in the post-World War II period, ranging from a low of 250,000 short tons in 1949 to a high of 2,500,000 tons in 1954. At the time of the long-term disposal program's inception, the three conventional-war stockpile objective was 450,000 tons, while Government stockpiles totaled 1,898,483 tons. Of this total, 769,499 tons were in the Defense Production Act (DPA) inventory and 1,128,984 tons were in the strategic stockpile. This left a surplus of 1,448,483 tons available for disposal. There had been a disposal program inaugurated in May 1963, covering 135,000 tons, of which 106,000 tons were sold to the three major primary producers through March 1965. The remaining 29,000 tons were set aside for small businesses but not sold.

Plans for a long-term disposal program were developed in February 1965 by the Government committee given the responsibility to provide for the disposal of all the DPA inventory and about 680,000 tons of national stockpile inventory. The latter disposal would, under law, require congressional approval. On February 18, 1965, the General Services Administration (GSA) was officially authorized by the Office of Emergency Planning (OEP) to develop a disposal plan and to reach agreement on it with the interested segments of the aluminum industry.

b. Industry Position on a Disposal Program.—At a meeting between the Government and the aluminum industry on May 10, 1965, industry representatives (in-

cluding primary producers as well as processors) made the following main points:

- The industry did not need the Government material, but was willing to cooperate to meet a national objective.
- All basic aluminum producers should participate in whatever program was worked out.
- Absorbing more than 800,000 tons over a 10-year period would disrupt employment, but this effect could be tempered by permitting flexibility within the program so long as the ultimate commitments were met, subject possibly to the commitment to take at least half of the 10-year total in the first 5 years.
- The program should be based on a series of firm contracts rather than spot sales.
- A 10-year disposal plan should cover only DPA tonnage (about 770,000 tons), since this material would be readily accessible for sale, whereas the national stockpile material would require congressional approval. If the total surplus were to be disposed of, the program should extend over a 15-year period.
- All sales should be made at market price through normal commercial channels, and should be based on an average aluminum content of 99.5 percent purity.
- Plans should be developed as early as possible to help industry make rational facility expansion plans.
- Consideration should be given to using the surplus in Government-sponsored projects.
- Provisions should be made for small-business set-asides.

c. Subsequent Meetings Regarding a Disposal Program.—A subsequent Government-industry meeting was held on July 7,

1965, with nine primary producers to continue negotiations on a disposal program. Discussions dealt with a long-range program to run about 10 to 15 years to cover the entire 1.4-million-ton surplus, with 100,000 tons to be disposed of in the first year. There were two main areas of disagreement: (1) method of participation: the large companies wanted all primary producers in the program, but some of the smaller producers wanted out; and (2) rate of release: the industry suggested 20 years; the Government wanted 10 years.

Other meetings were held in July and August at the urging of the White House, which was concerned about budget deficits and the inflationary impact of increasing Vietnam War demands. Both sides stepped up their efforts in September and October. They appeared to be near an agreement when price increases announced by various companies in late October and early November precipitated a tug-of-war between Government and industry.

d. Government Alternatives for Disposal of Surplus Aluminum.—On November 6, 1965, the White House released a statement by Secretary of Defense McNamara which referred to the following five alternative formulas proposed by the Government for disposal of surplus aluminum, none of which were accepted by the industry:

1. Disposal of 100,000 tons per year for 14 years; no further sales unless defense requirements in any year exceeded the level of defense requirements in 1965. If so, industry would buy such excess based on allocable shares of the first 100,000 tons.
2. Same as alternative 1, except that if defense requirements reached the above level, the Defense Department would furnish as much as it could as Government-furnished material; the Government would dispose of the rest at market price and industry would process Government-furnished ingots.

3. Disposal of 528,000 tons as follows: the amount by which defense requirements exceeded the 1965 level, plus 100,000 tons per year, both instances on a base of proportional shares, with the obligation not to exceed 150,000 tons in one year.
4. Disposal of 200,000 tons over a 1-year period on an allocable-share basis.
5. Disposal of 200,000 tons; the Defense Department would furnish as much as it could as Government-furnished material; the remainder would be disposed of at market price.

e. **Further Industry Proposal for Aluminum Disposal.**—The industry was reported to have proposed a “complex system” under which they would procure from the stockpile only half of the aluminum used in defense production, with a guarantee of not less than 100,000 tons per year. The industry’s proposal would presumably have required a complex system of certificates relating to each contractor and subcontractor, which would not have been possible in the next 12 months. The Government, nevertheless, stated that it would accept the industry’s proposal if the industry would be willing to guarantee the purchase of 200,000 tons in 1966, which it did not undertake to do.

Statements by the Chairman of the Council of Economic Advisers and the Secretary of the Treasury, also issued on November 6, 1965, said respectively that the price increases were inflationary and unjustified, and that a stockpile release was needed to help cover military needs and reduce the balance of payments deficit.

Industry consensus was not opposed to the 200,000-ton proposal for 1966, providing adequate provision could be made to cover defense business. Discussions between government and industry about these terms had been limited to four companies, and there was concern about how other producers would fit into a disposal plan. There was some feeling

that the 200,000-ton proposal came in response to the industry’s action in raising prices.

f. **Release of Surplus Material.**—On November 9, 1965, OEP directed GSA to release 300,000 tons for sale from the DPA inventory, with no mention of a long-term disposal program. The first 100,000 tons would be offered for sale immediately. However, other events intervened before a sale was made. The price increases previously announced were rescinded, and negotiations were resumed on November 16, 1965, for an orderly long-range disposal program. On November 23, 1965, GSA announced that agreement had been reached with four major producers, with other domestic producers, as well as the Aluminum Co. of Canada (Alcan), eligible to participate. A Memorandum of Understanding was entered into, and contracts issued accordingly. Three of the additional producers did become part of the program in early 1966.

Approval for the disposal of surplus material in the national stockpile was effected on June 21, 1966, and the disposal of this material and the DPA material proceeded. On December 20, 1972, the stockpile objective was reduced to zero as part of an overall review of objectives, and the contracts were amended accordingly.

The history of disposals is contained in the table of Aluminum Stockpile Disposals (table B-1), accounting for all but 17,500 tons of aluminum, which remained after June 1974. This amount has subsequently been sold. Fluctuations in the rate of disposal reflect the flexibility built into the program. The surge in 1973 and 1974 was largely the result of increased civilian demands.

For the entire period, the disposal of approximately 1.4 million tons of surplus aluminum represented about 3.8 percent of the total apparent consumption of primary aluminum (producers’ shipments, plus imports, plus stockpile receipts, minus exports). It also accounted for about 45 percent of the ingot equivalent to all defense-rated shipments. To the extent such shipments were covered by

Table B-1.—Aluminum stockpile disposals

Period	Defense production act inventory		National stockpile inventory		Total		Cumulative total	
	Quantity short tons	Value (\$000)	Quantity short	Value (\$000)	Quantity short tons	Value (\$000)	Quantity short tons	Value (\$000)
Nov.-Dec. 1965	49,455	24,462	—	—	49,455	24,462	49,455	24,262
Jan.-June 1966	223,964	109,959	—	—	223,964	109,959	273,419	134,421
July-Dec. 1966	44,142	21,570	39,733	19,715	83,875	41,285	357,294	175,706
Jan.-June 1967	7,416	3,891	36,295	17,817	43,711	21,708	401,005	197,414
July-Dec. 1967	1,530	771	511	255	2,041	1,026	403,046	198,440
Jan.-June 1968	6,849	3,460	24,363	12,086	31,212	15,546	434,258	213,986
July-Dec. 1968	6,627	3,484	20,074	10,542	26,701	14,026	460,959	228,012
Jan.-June 1969	18,822	10,238	73,823	39,574	92,645	49,812	553,604	277,824
July-Dec. 1969	10,077	5,489	34,588	18,926	44,665	24,415	598,269	302,239
Jan.-June 1970	1,527	857	17,145	9,618	18,672	10,475	616,941	312,714
July-Dec. 1970	—	—	23	13	23	13	616,964	312,727
Jan.-June 1971	—	—	20	12	20	12	616,984	312,739
July-Dec. 1971	750	435	1,500	870	2,260	1,305	619,234	314,044
Jan.-June 1972	—	—	3,857	2,226	3,857	2,226	623,091	316,270
July-Dec. 1972	6,000	3,000	—	—	6,000	3,000	629,091	319,270
Jan.-June 1973	102,750	52,577	201,248	101,282	303,998	153,859	933,089	473,129
July-Dec. 1973	133,991	68,609	369,126	185,792	503,117	254,401	1,436,206	727,530
Jan.-June 1974	169,852	100,825	279,626	174,077	449,478	274,902	1,885,684	1,002,432

salescommitments.

Source: Stockpile Reports to the Congress, Office of Emergency Planning and successor agencies.

stockpile aluminum, an equivalent amount was of course made available for civilian business.

3. Program Provisions

The disposal was tied into a Government Use Program, under which DOD contractors (and other Government agencies as approved) were required to purchase, directly or through subcontractors, 1 pound of excess stockpile aluminum for every pound of aluminum contained in the items acquired under contracts, with reasonable exceptions for de minimis quantities.

From November through December 1966, the total industry commitment was 150,000 tons; for subsequent years a minimum of 100,000 tons and a maximum of 200,000 tons were established. Within these totals were assigned specific quantities for participating producers based on their proportion of total installed capacity at the end of 1965, taking into

account capacity under construction and shipments from Alcan to the United States.

For companies participating in the program, the breakdowns were as follows, with reference to 1967 and beyond. These were, in effect, merely guidelines, rather than firm requirements.

	short tons	
	Minimum	Maximum
Alcoa.	29,400	58,800
Reynolds.	22,400	44,800
Kaiser.	20,100	40,200
Olin.	3,800	7,600
Revere.	1,900	3,800
Harvey.	2,700	5,400
Alcan.	10,000	20,000
	90,300	180,600

The program was established in 4-year intervals, the first ending in December 1969 and the second in December 1973. To provide flex-

ibility, each participant could purchase more than its obligation in any period and could defer annual obligations within a 4-year period. Contracts were to run until all excess material had been sold. Set-asides for small business, nonintegrated purchases, and other nonparticipating purchases amounted to 25,000 tons in 1966 and 10,000 tons annually thereafter. Quantities set aside for these purposes but not sold were to become part of the industry's overall commitment.

The purchase price was to be each participating purchaser's published price in effect at the date of delivery for the sale of the grade, form, size, and quantity of aluminum involved (including and subject to the standard terms and conditions applicable thereto), less the lower common carrier rate from Government storage location to destination. It was provided that if on the date of delivery the current published price of any other participating company were lower than the participating purchaser's published price, the lower price would prevail.

B. TITANIUM STOCKPILE PROGRAM, 1972-75

1. Introduction

The titanium stockpile program inaugurated in June 1972 was a classic example of the full-scale arrangement—from acquisition to disposal—containing all the elements of mobilization base, economics, and politics. As a move to keep in existence the titanium industry whose future was otherwise threatened by market conditions, the program had the support of the Department of Defense (DOD), segments of Congress and, of course, the industry itself. An added consideration was a quid pro quo with Congress—a titanium stockpile in exchange for the release of other stockpile material bottled up in congressional committee.

To date, the program has run close to its schedule, and it appears to have more than

4. Conclusion

Despite many of the problems incidental to potential serious economic disruptions which could affect a large industry, the aluminum disposal program appears to have accomplished its purpose. The positions taken by the aluminum industry reflect one of the major difficulties encountered with any commodity stockpile disposal program, the fears of market disruption to the detriment of industry.

5. References

- Bureau of Domestic Commerce, unpublished memoranda Washington, D. C.: U.S. Department of Commerce.
- Farin, P., et al. *Aluminum—Profile of an Industry*. New York: McGraw-Hill, 1969.
- Fifteenth Annual Report of the Activities of the Joint Committee on Defense Production, Washington, D. C., Jan. 17, 1966, (Contains details on stockpile negotiations and price developments in November 1965.)
- Hass, J. A., A. M. Poret, and A. H. K. Tan *The Aluminum Price Crisis of November 1965—Its Effect on Business-Government Relations*. Pittsburgh: University of Pittsburgh Graduate School,
- Office of Emergency Preparedness, Semi-Annual Stockpile Reports to the Congress, Washington, D.C.

served its purpose of maintaining a titanium industry in this country. From the standpoint of the two producers involved, the results have been favorable in that an approximate doubling of the domestic market price since the inception of the program has resulted in potential financial gains through buy-back privileges at the original price. This case study presents the record of the government-industry titanium program with a discussion of available options aside from stockpiling,

2. Titanium Use in Aircraft Industry

The fortunes of the titanium industry in the United States have been closely tied to the ups and downs of both military and civilian aircraft production, in which about 90 percent of all titanium finds its use due to its high

strength-to-weight ratio. The industry was started in 1950 through Government aid in the form of guaranteed purchase contracts, loans, loan guarantees, and research contracts. Although six large companies had begun producing titanium sponge, the raw material for mill products and castings, only one company remained in production by 1960, Increasing

markets and Government prodding subsequently led to the entrance of other firms, but the collapse of the SST program in particular put these in jeopardy by the last half of 1971. There were then three integrated titanium producers handling all stages from raw material to finished products. Their situations are summarized in the table below:

<i>Company</i>	<i>Location</i>	Titanium sponge annual capacity (million lb)	Operating status	Employees laid off	Financial losses 1970 (\$ million)
TIMET ^a	Henderson, Nev.	28	Closed 6-71	500	\$5.6
RMI ^b	Ashtabula, Ohio	15	Closed, 12-71	150	6.0
OREMET ^c	Albany, Oreg.	5	Closed, 8-71	125	2.4
		48		775	14.0

^a50 percent owned by Allegheny Ludlum Steel.

^bJointly owned by U.S. Steel and NL Industries.

^cPrincipal stockholders, Armco Steel and Ladish Forge,

a. **Titanium Imports.**—With imports from the U.S.S.R. and Japan accounting for 30 percent of domestic usage of titanium sponge, the demand in 1971 and that projected for 1972 would be only large enough to permit U.S. producers to operate at no more than 40 percent of capacity. Immediate factors in the closings shown in the above table were not only the decline in sales, but the resulting large inventory accumulations amounting to 9 to 12 months' supply. Imported material was of the quality required by some domestic mill product producers. In addition to the three integrated producers, there were six nonintegrated producers of titanium mill products, most of whom were using imported sponge.

b. **Impact of Titanium Industry Closings.**—The plant closings and the unfavorable prospects for a near-term recovery of titanium demand led to serious concern from several areas about the future of the U.S. industry. The DOD was worried about a viable domestic

industry for a mobilization base, as was the OEP. The two Senators from Nevada were worried about employment at the plant at Henderson. The industry was naturally worried about its own existence.

Discussions were already being held in Government circles. When the chairman of the Joint Committee on Defense Production wrote to the Director of OEP on November 1, 1971, requesting reports on the following: current status of the industry, estimates of future demand, views as to a need for maintaining a domestic industry, and information on any action taken or contemplated in connection with maintaining a domestic titanium industry. At about the same time, industry officials were in contact with both OEP and DOD on the same subject. OEP's December 22 reply to the Joint Committee summarized the situation and stated that an analysis was being made of the extent to which a domestic titanium industry would be needed to meet mobilization require-

ments, and that work with DOD would continue in examining alternatives for sustaining the industry to meet national security needs.

In addition to the overall concern about the future of the domestic industry, there were also considerations regarding even the temporary plant closings, which raised questions about the deterioration of plant facilities unused for a number of months and the availability of technicians and skilled labor for reopening these plants.

3. The Available Options

As a result of discussions between OEP, DOD, other interested agencies, and the industry, the following six options were put forth, although the last three were not given serious consideration:

a. Option 1.—Government purchase of 7,000 tons of titanium sponge for the national stockpile, all from domestically produced sponge. The total stockpile objective was 33,500 short tons, while the amount in the stockpile was 26,501 tons, leaving the 7,000 tons contemplated for purchase. All the material in the stockpile met stockpile specifications. (There were, in addition, 8,514 tons of nonspecification material.) As part of the arrangement, the participating companies would buy back the material, if and when stockpile surpluses later developed. Of the 26,501 tons of specification quality, 6,000 tons were in the national stockpile, 9,021 tons in the supplemental stockpile, and 11,480 tons in the DPA inventory. The release of the 15,021 tons in the national and supplemental stockpiles under the buy-back provision would require not only a declaration of excess but also approval by Congress for its release. The latter provision was not applicable to the DPA stockpile. The purchase of the 7,000 tons would be paid for with other materials excess to the stockpile in lieu of cash. A previous purchase of 6,000 tons of domestic origin, completed in December 1970, was likewise paid for by surplus materials,

b. Option 2.—A buy-American policy, put into effect by DOD, required all titanium for filling defense contracts to be made from domestic sponge. As part of its review of this option, DOD surveyed titanium product producers and found that four of nine companies would have no problem in using domestic sponge, but that the five others would have problems because of chemical characteristics, requiring the installation of new facilities to adapt to the use of domestic sponge. After considering this option, DOD rejected it as not achieving the purpose intended, that of being a short-run politically feasible solution.

c. Option 3.—Direct DOD funding of (1) new manufacturing technology programs to include additional projects intended to make titanium more economically usable and more adaptable for use in DOD weapons systems; and (2) research on the use of domestic ilmenite ore for titanium sponge products in lieu of imported rutile ores. These, again, are longer term solutions to the problems of the industry. DOD did proceed with its manufacturing technology program, while the ore question became part of other agency research, including that of the Materials Advisory Board.

d. Option 4.—Government financing of layaway or standby costs of one sponge facility which had sufficient productive capacity to meet future defense requirements.

e. Option 5.—Government financing of costs to upgrade the quality of sponge produced in the three U.S. facilities and subsequent implementation of the buy-American provision.

f. Option 6.—Government purchase of one of the current U.S. sponge facilities. The Government would maintain it in operating condition for current and future defense requirements.

4. Acquisition and Revisions

The stockpile purchase/buy-back option was adopted as a feasible solution to the

titanium mobilization base problem. On January 16 1972, OEP authorized GSA to acquire 7,000 tons of titanium sponge meeting current purchase specifications in order to fill the deficit in the stockpile objective and to maintain the domestic mobilization base. The procurement would be limited to material produced domestically, subsequent to the effective date of contracts to be made with the producers, and would be achieved over a 2-year period. Payment would be made solely from excess materials authorized for disposal. (A previous authorization to acquire 7,000 tons, made in December 1969 was almost immediately rescinded at the request of the Office of Management and Budget.)

The buy-back of the material by the producers would be at the option of the Government and subject to its being declared excess and available for disposal. Until the total inventory was disposed of, the purchasers had to agree to refrain from any current expansion of facilities for the production of sponge anywhere in the world,

Contract negotiations with the three sponge producers were begun immediately, but were not consummated until June 1972, and then only with the two largest producers—TIMET and RMI. The third company, OREMET, was in financial difficulty, and although time extensions were granted the company, nothing came of them. The 500 tons which would have been purchased from OREMET was dropped from the program.

Each contractor was to supply 3,250 short tons at \$1.245 per pound, including brokerage costs in disposing of the payment materials and costs for special packaging to meet government specifications. Delivery was required over a 2-year period. The equal amounts for the two companies did not take into account the differing productive capacities.

5. The Buy-Back Program

The buy-back provisions called for purchase by each of the two participating producers

over a 10-year period; i.e., 8 years beyond the period for Government acquisition. The provisions would be subject to future Government actions in declaring the sponge both excess and available for disposal.

Ten percent of the excess authorized for sale would be set aside for other then-participating producers and for direct use by the Government.

In the contracts, the two producers were given the option of buying back at the original acquisition price of \$1.245 per pound or at the market price at time of sale. Both companies chose the original acquisition price—a wise move from their standpoint in view of the nearly 100-percent increase in the current price.

6. Deliveries Under the Program

Of the two companies, only RMI has completed its contractual deliveries. RMI had delivered 3,249 tons by May 24, 1974, and has already entered into the buy-back phase of the contract, having taken about 600 tons of DPA material to date. As of December 31, 1974, TIMET deliveries totaled 2,103.3 short tons against the obligation of 3,250 tons. The completion date for deliveries was extended to March 31, 1975. TIMET has faced production problems due to shortages of chlorine and natural gas as production and energy materials.

The stockpile objective was reduced to zero in April 1973 as part of the overall review of stockpile policy, but it is subject to further review. Although the entire stockpile is therefore now in excess of mobilization needs, acquisition has continued in accordance with the contracts. About 50 percent of the 8,514 tons of nonspecification material has been separately disposed of. Sale of recent authorization covering 975 tons for DOD use is pending.

7. Conclusion

There has been decided market improvement since the stockpile program was begun.

Domestic production of sponge increased in 1973 by more than 40 percent over 1972, and it increased by another 18 percent in 1974. Part of this production was, of course, due to the program. At the same time, sponge metal consumption increased by 54 percent in 1973 and by 33 percent in 1974. Imports accounted for slightly less than 30 percent of total consumption in each of these 3 years. It would appear that the increased demand—resulting from higher domestic and foreign purchases of military aircraft, as well as stronger nonaerospace demand—would have gone far toward sus-

taining the industry without the need for the stockpile program. Much, if not all, of the material which moved into the stockpile would have found current markets. In any event, the domestic industry is now considering capacity expansion,

8. References

Files of the Office of Preparedness, General Services Administration.
Study of Titanium Usage, Materials Advisory Board, National Academy of Sciences.

C. EXPANSION OF COPPER-PRODUCING CAPACITIES: THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

1. Introduction

In view of the international situation existing at the time the Defense Production Act of 1950 (64 Stat 798, 50 U.S.C. Sec. 2061 et seq.) was debated, it was recognized that in order to provide for the national defense and national security it would be necessary to divert certain materials and facilities from civilian use to military and related purposes. In order to reduce the time required to achieve full mobilization in the event of an attack on the United States, it would also be necessary to develop preparedness programs and expand productive capacity and supply beyond the levels needed to meet civilian demand. This case study is a brief account of a successful effort that in the end accounted for more than a million tons of copper production.

2. Defense Production Act of 1950

Neither the Stockpile Act of 1939 (53 Stat. 811) nor the Stockpiling Act of 1946 (60 Stat 596, 50 U.S. C, Sec. 98d) had made any provision for governmental assistance to encourage expansion of copper production. The Defense Production Act of 1950, as amended, was in-

tended to establish a system of priorities and allocations for materials and facilities, to authorize the requisitioning thereof, to provide financial assistance for expansion of productive capacity and supply, to provide for the settlement of labor disputes, to strengthen controls over credit—and by these measures, to facilitate the production of goods and services necessary for national security and other purposes. The act authorized Government action to divert scarce resources into the production of military weapons and other essential programs, including stockpiling; to expand production of needed materials, equipment, and components; and to minimize the economic impact of the defense buildup.

a. Authorization of Contracts and Orders.—Title I of the act authorized the President to require that contracts or orders deemed necessary or appropriate to promote the national defense, be given priority and allocation assistance to the extent necessary or appropriate. These powers were not to be used to control the general distribution of any material in the civilian market, unless it was a scarce and critical material essential to the national

defense, and unless the requirements of the national defense for such materials could not otherwise be met without causing a significant dislocation of the normal distribution in the civilian market, thereby creating appreciable hardship. Title I also contained provisions for protection against hoarding and price gouging.

b. **Expansion of Productive Capacity, Incentives.**—Title III of the act was designed to promote the expansion of productive capacity and supply of materials necessary for the national defense. Under title III, provision was made for loan guarantees and loans for the expansion of capacity, the development of technological processes, or the production of strategic and critical metals and minerals. This financial assistance was to be made available only to the extent that it was not otherwise available on reasonable terms.

Also under title III, provision was made for the purchase or commitments to purchase metals, minerals, and other materials for Government use or resale, and for the encouragement of exploration, development, and mining of critical and strategic minerals and metals. Under title III, a variety of production expansion programs were developed for a number of materials. These included production loans, Government floor-price purchase contracts, and issuance of certificates of necessity. These certificates permitted accelerated amortization of capital investment for tax purposes and exploration loans up to 50 percent of total costs repayable from eventual production,

c. **Tax Provisions and Floor Prices.**—As indicated above, the Defense Production Act of 1950 was designed to produce the stimulus needed to expand production in a number of materials. These stimuli included rapid tax amortization, loans, and floor-price purchase contracts to stimulate private companies to increase mine production. Under these contracts the Government agreed to purchase specified amounts of output at the

guaranteed floor price if the market should not take up these quantities at that price or a higher price,

In 1951 and 1952 the Defense Production Administration approved 10 projects for Government assistance in the production of copper. In most of these projects a floor price was guaranteed in a long-term purchase contract. Until the middle of 1952 no actual purchases of copper by the Government had occurred on such expansion contracts. Some of the 10 projects also involved accelerated tax amortization, or government loans, or both.

d. **Increase in Production.**—It was estimated that the annual increase in output from the mines opened by these projects would total about 250,000 tons of copper. It was expected that the full output would come in by 1955 and that about 100,000 tons would be available in 1954.

3. Results of the Program

Table B-2 lists 19 contracts to expand production of copper. In terms of the Government's commitment to purchase copper under these contracts, the total potential commitment of the 19 projects totaled 1,191,240 short tons of copper. However, since copper prices were relatively good during much of the contract delivery period, 949,345 tons were sold to industry and only 253,525 tons were delivered to the government. In addition, obligations to deliver 9,924 tons to the government were canceled.

There was also a small program for the maintenance of production at some mines which could not produce copper at the fixed price prevailing in 1952. Contracts were consummated for 30,434 short tons of copper at an average subsidy of \$127.39 per ton. These contracts were terminated on removal of copper from price regulation in March 1953. Under this program, 16,201 tons of copper were delivered.

Table B-2.—Copper: Summary of Defense Production Act borrowing authority transactions

(In short tons)

Contract number	Contractor	contract quantity	Delivered to Government	"Put" rights not used	Canceled
DMP-III-11	Rhodesian Congo Border Power Corp. . .	34,316	15,705	18,611	—
DMP-19	San Manuel	347,500	79,117	268,383	—
DMP-131	National Lead Co.	3,600	1,420	430	1,750
D-12190	White Pine Mining Co.	243,750	30,045	213,705	—
DMP-80	International Nickel Co.	50,000	47,504	—	2,496
DMP-83	Banner Mining Co.	6,480	4,833	—	1,647
DMP-89	Copper Range Co.	3,982	8,658	—	345
D-12129	AS+R.	88,500	—	88,500	—
D-12116	Anaconda	128,000	—	128,000	—
DMP-94	Appalachian Sulphide	2,000	2,000	—	—
DMP-3	Campbell Chibougamau.	31,600	—	31,600	—
D-12084	Copper Cities	85,000	—	85,000	—
DMP-84	Copper Creek Cons. Mining Co.	2,750	101	—	2,649
DMP-60	Falconbridge.	16,000	15,978	—	22
DMP-92	Howe Sound Co.	5,939	5,935	—	4
DMP-57	Miami Copper Co.	25,198	25,198	—	—
D-12087	North Butte Mining.	2,625	—	2,625	—
D-12088	Phelps Dodge.	112,500	—	112,500	—
DMP-90	Riviera Mines Co.	1,500	468	—	1,032
Subtotal		1,191,240	231,959	949,354	9,924
Various	Maintenance of production (1952).	30,434	16,201	—	14,233
Various	Stockpile diversions.	5,365	5,365	—	—
Total		1,227,039	253,525	949,354	24,157

Source: Report on Borrowing Authority, June 30, 1974. Office of Preparedness, General Services Administration

4. Conclusion

The program did achieve its objectives; however, it is important to recognize that price incentives were used and that tax amortization certificates were also issued as stimulus under the program. Several properties operating today began producing as a result of this expansion program.

5. References

Defense Production Act of 1950 (64 Stat 798, 50 U.S.C. Sec. 2061 et seq.)
 Report on Borrowing Authority, June 30, 1974, General Services Administration,
 Files of Office of Preparedness, General Services Administration.

D. RELEASES OF COPPER FROM THE STOCKPILE

1. Introduction

Because of past efforts to stimulate the production of copper for the defense stockpile, the subsequent history of disposals represents a change in stockpiling policy which primarily

reflects determinations by the executive departments of the Federal Government, largely through Presidential action. This case study indicates how the copper releases were accomplished and the steps taken in stockpile disposal.

2. Early Releases of Copper

a. Coinage Releases.—In November 1959 the Bureau of the Mint purchased copper for coinage from industry at a price which was publicly criticized because of its high level, especially since copper was available in the national stockpile and Defense Production Act inventory. The Mint thereafter sought the copper it needed from the stockpile.

Between May 24, 1960, and October 22, 1964, nine separate releases totaling 107,000 tons were made to the Mint. At the time these releases were made, the total inventory of copper exceeded the copper stockpile objective, and all of these releases were made from the DPA inventory. It was therefore not necessary to secure congressional approval.

b. Requests for Stockpile Releases.—Subsequent to the declassification of stockpile information in 1962, the Office of Defense Mobilization (subsequently the OEP) was besieged with frequent requests that copper be released to industry from the stockpile. The OEP consistently resisted these demands, pointing out that the stockpile was not designed to be an economic weapon or to act as a buffer stock, and that it was to be released only on authority of the President for the common defense in time of war. At that time the maximum stockpile objective for copper was 1 million tons and the inventory totaled about 1,135,000 tons. Since preliminary estimates indicated that the nuclear stockpile objectives, when established, would exceed the inventories then on hand, it was not considered prudent to release even that amount which exceeded the objectives. In June 1963 the copper stockpile objective was reduced from 1 million tons to 775,000 short tons.

In 1963 and 1964 the price of refined copper in the foreign markets was substantially higher than the U.S. producer price, and U.S. dealers tended to follow the foreign market price rather than the U.S. producer price. These differentials gave rise to demands for copper from the U.S. stockpile inventories

which, if released, would be at the U.S. producer price level. A frequently submitted rationale was that the copper was required for defense contracts and that the costs of materials would ultimately be borne by the Government.

3. Copper Releases Accelerated

In December 1964 the President ordered the release of 20,000 tons of copper from the stockpile. This was released from the DPA inventory and was allocated by the BDSA (Commerce Department) on a defense-related hardship basis. The remaining balance of DPA copper was relatively small--only 6,186 tons.

In April 1965 a second release to industry was authorized by the Congress and the President (Public Law 89-9). This time, 100,000 tons were released from the strategic stockpile. Again allocations were made by BDSA on a defense-related hardship basis.

a. Further Coinage Requirements.—In August 1965 the Mint indicated a new and larger need for copper. Public Law 89-81, approved July 16, 1965, provided for the elimination of silver from dimes and quarters and a reduction in the silver content of half dollars from 90 percent to 40 percent. The new dimes and quarters would consist of about 90 percent copper and 10 percent nickel, while the half dollars would be about 60 percent copper. In view of these estimated coinage needs for copper over the next several years, the Treasury requested that 117,000 tons of copper be earmarked for Mint use, in addition to that already so identified.

The Director of OEP requested the Administrator of GSA to make available to the Mint all of the uncommitted DPA copper in inventory, except 1,800 tons to be reserved for payment in kind for upgrading contracts and approximately 110,000 tons of fire-refined copper from the national stockpile. Since the 110,000 tons needed congressional authorization, the Director of OEP requested the Ad-

ministrator of GSA to seek such approval as soon as possible, including a waiver of the 6-month waiting period. The authorization was approved by the Congress on October 9, 1965, in Public Law 89-251.

b. **Presidential Authority.**—On November 15, 1965, the Attorney General sent a memorandum to the Director of OEP, advising him that under section 5a of the Stockpiling Act of 1946, the President may order the release of material from the stockpile at any time when, in his judgment, such release is “required for purposes of the common defense.”

On November 17, 1965, the Secretaries of Commerce, State, Treasury, and Defense, and the Chairman of the Council of Economic Advisers signed letters which recommended the immediate release of 200,000 tons of copper from the national stockpile for purposes of the common defense.

c. **Anticipated Supply Disruption.**—Defense uses of copper for the Vietnam war were substantial at the time and were expected to double in 1966. The Chilean copper industry, the largest single foreign supplier to the United States, was on strike, and the supply of copper from Zambia was in danger of being cut off. This would have imposed serious disruptions in the supply of copper for the industrial nations of Western Europe, and these disruptions, in turn, would have had repercussions for the total supply of copper available to the United States.

4. **Presidential Action**

On November 18, 1965, the President, acting in accordance with the provisions of section 5 of the Strategic and Critical Materials Stockpiling Act of 1946, as amended (50 U.S.C. 98d), ordered the release of 200,000 tons of copper from the stockpile for purposes of the common defense. Three corollary actions were taken:

- Exports of both copper and copper scrap from the United States would be controlled for an indefinite period in order to conserve domestic supply;

- Legislation was to be requested of Congress by the administration to permit the suspension of import duties on copper, which at that time amounted to 1.7 cents per pound; and
- Discussions were to be held with the directors of the New York Commodity Exchange urging them to curb excessive speculation in copper trading by raising the margin requirements from the current level of 10 percent to a figure more comparable to that required by the New York Stock Exchange (i.e., 70 percent at that time),

a. **Further Request.**—Approximately 4 months after the November 1965 release of 200,000 tons of copper from the national stockpile, another request for a similar amount was put forward,

Despite the imposition of U.S. export controls on copper, copper scrap, and copper products, which helped to prevent any serious disruption of domestic production or further increases of prices in the dealers' market, the demand for copper continued to increase, and many users found difficulties in obtaining adequate supplies. The increase in demand for copper gave credence to the belief that speculative inventories were being accumulated.

According to a memorandum for the Attorney General from the Acting Chairman of the Council of Economic Advisers, the rationale for another stockpile release appeared to be more directly related to economic considerations and only indirectly related to defense needs,

b. **Further Presidential Action.**—On March 21, 1966, the President, again acting in accordance with the provisions of section 5 of the Strategic and Critical Materials Stockpiling Act (and basing his action on the opinion of the Attorney General and on letters signed by the director of OEP; the Secretaries of State, Treasury, and Commerce; the acting Secretary of Defense; and the Acting Chairman of the

Council of Economic Advisers), determined that a release of 200,000 tons of copper was required for purposes of the common defense. The President directed that disposals should be made through regular producer channels on a periodic basis and in such a way as to facilitate the orderly distribution of copper supplies with priorities to defense and defense-supporting users.

c. Replenishment Option.—The Secretary of Commerce, the Director of OEP, and the Administrator of the GSA were instructed to make provision, in connection with the copper disposals, to give the Government an option to replenish the stockpile at the then-current market price of 36 cents, or at the domestic market price if it were less than 36 cents at the time the Government option was exercised. The option arrangement was to give the Government the right to call for immediate delivery in the event of any emergency,

The Administrators of the GSA and other Government agencies were instructed to use acceptable substitutes for copper where feasible.

d. Domestic Expansion Plan of 1966.—The Secretaries of Commerce and Interior and the Director of OEP were instructed to take all necessary steps to expand domestic production of copper through the use of special incentives on a selected basis.

On March 29, 1966, the President authorized the Director of OEP to take steps to accomplish a copper expansion program. (See Case Study on the second copper expansion.)

The repurchase of copper never took place. Funds were not available for repurchase in 1969, 1970, 1971, or 1972. Finally, in September 1971, the Administrator of GSA was authorized by the Director of OEP to cancel all options to repurchase this copper.

e. Industry Position on a Third Release.—By September 1966 the question of a third release of 200,000 tons of copper from

the national stockpile was raised. In a meeting at the Department of Commerce the eight leading copper producers indicated they felt there was no need for any additional releases of copper from the stockpile; in fact, they did not want it and believed they could handle all defense orders without assistance. They felt the inventory was too low and might be needed at some future time. However, if any release was to be made, it should be confined to defense-related orders. Furthermore, the producers did not want to handle the allocation and wanted someone else to do it. It should be noted that these were the opinions of the producers who were ever mindful of their markets and their customer relations.

The consumer inventories of fabricated copper mill products were high at the time, and the order boards at the mills contained many duplications. It was also estimated that a release of copper would probably go into inventories rather than consumption.

However, labor contracts were due to expire between March and June 30, 1967, and the extra inventory could support industrial production during the second and third quarter of 1967 if strikes occurred.

f. Presidential Action.—A review under revised criteria affecting the stockpile objective for copper appeared to support an inventory objective of about 250,000 tons. The inventory at the time was 408,000 tons. On December 1, 1966, the President, in accordance with the provisions of section 5 of the Strategic and Critical Materials Stockpiling Act, as amended (50 U.S.C. 98d), determined that the release of 150,000 tons of copper was required for purposes of the common defense. This left the copper inventory balance at 258,000 short tons.

The President's letter ordering the release of 150,000 tons of copper noted his approval of the recommendations of the Office of Emergency Planning; the Secretaries of Treasury, Defense, and Commerce; the Acting Secretary of State; and the Chairman of the

Council of Economic Advisors. The letter also directed that disposals should be made through regular producer channels solely for defense and defense-supporting uses, as necessary.

On December 2, 1966, the OEP instructed GSA and Commerce to sell the 150,000 short tons of copper released from the stockpile in two lots—90,000 tons in February and 60,000 tons in May.

g. Industry Proposal.—Copper industry-labor contracts were up for renegotiation in mid-1967. Subsequently, the copper producers indicated to BDSA that they might have a difficult time absorbing the full impact of defense orders when the stockpile copper was exhausted. It was proposed that the copper be sold as follows:

- 22,000 S.T. (short tons) each month for the first 3 months of 1967;

- 20,000 S.T. each month for the next 2 months of 1967;
- 12,000 S.T. each month for the next 2 months of 1967; and
- 9,000 S.T. each month for the next 2 months of 1967.

This would permit the copper producers to stretch out the copper over a 9-month period, and it would provide a hedge against the possibility of strikes in their copper mines.

5. Final Disposal of Copper

The balance of copper inventory was subsequently released to the U.S. Treasury for coinage. This terminated the copper stockpile disposal program.

6. Reference

Files of Office of Preparedness, General Services Administration.

E. SECOND EXPANSION PROGRAM, DUVAL SIERRITA MINE

1. Introduction

This case study is an account of the Federal program which resulted in the establishment of the Duval Sierrita mine, an operation which is producing copper today with a favorable return to the Government and a substantial improvement in the availability to U.S. industry of copper and molybdenum.

2. The Title III Proposal

The release of 200,000 tons of copper ordered on March 21, 1966, carried with it the suggestion that production capacity for copper be increased. This suggestion was formalized in a letter dated March 29, 1966, from the President to the Director of the Office of Emergency Preparedness (OEP) which authorized him to take steps to encourage additional production through new purchases or

commitments to purchase copper under section 303 of the Defense Production Act.

The Director of the OEP thereupon directed the Administrator of the General Services Administration (GSA) to develop, by authority of title 111 of the Defense Production Act, a limited program of expansion of copper production capacity in addition to such increases in capacity as were then contemplated or already underway by domestic producers. Priority attention was to be given to those situations where additional copper production could be brought into being in a relatively short time. The period of performance of proposed contracts covering purchases and commitments to purchase under the program was not to extend beyond June 30, 1971.

An effort was to be made to provide for total commitments of approximately 120,000 tons of

copper. However, in view of the limitations on use of the borrowing authority contained in section 304(b) of the Defense Production Act of 1950, as amended, the total of new purchases and commitments, including contingent liabilities, was not to exceed \$100,000.

a. Purchase Price Estimates.—The proposed supply of copper could not be effectively increased at lower prices or on terms more favorable to the Government. Therefore, it was recognized that purchases, or commitments to purchase, involving prices higher than the one then current (**36** cents per pound), or involving anticipated loss on resale, would be inevitable.

An OEP telephone survey of the major copper producers revealed that 10 of these producers had their own expansion program underway and did not need or want Government assistance. Estimated 1965 production of these 10 companies totaled 1,193,625 short tons. Capacity to be added was estimated at 95,000 tons in 1966; 114,500 tons in 1967; and a net addition of 21,000 tons in 1968.

Potential additional expansions for which Government assistance would be needed showed an additional potential capacity of 4,750 tons which could be in during 1966, 20,000 more in 1967, and 30,000 in 1968. However, these projections were dependent upon higher prices.

b. Marginal Properties.—Firms seeking to expand production or initiate new production from marginal properties were invited to submit applications for governmental assistance to the GSA, which chaired an interagency working group including representatives of the Departments of Commerce and Interior and the OEP. The group evaluated proposals received under the program and recommended appropriate disposition. Forms of governmental financial assistance which were considered included advances on firm purchase contracts, guaranteed private loans, and incentive price arrangements. In addition, the program attempted to utilize to the extent possible the

facilities, funds, and authorities available in such agencies as the Department of Commerce, Interior, and the Small Business Administration.

3. Selection of Duval Corporation

Under this program, approximately 150 applications were received from firms and individuals. From the several proposals received, one contract, involving substantial long-term production of new copper, was executed in November 1967 with the Duval Corp., a subsidiary of the Pennzoil Corp. The Duval Corp. was to develop and operate the Duval Sierrita mine in Pima County, Ariz. Of the \$100 million authority available in the Defense Production Act, this project took \$83 million, to be repaid with 109,000 tons of copper,

a. The Contract.—As the contract was originally written, the Duval's Sierrita mine in southern Arizona was to produce **60,000** short dry tons of ore per day. Between November 1967 and March 1973, eight amendments were attached to the contract. These concerned increases in minimum capacity from 60,000 to 70,000 short dry tons per day; a stretchout of deliveries completion from 1971 to 1975, then to 1979; an increase of working capital of the company from \$10 million up to \$25 million; and the shipment of electrolytic cathodes in lieu of electrolytic wirebars. The switch to cathodes was made to accommodate the needs of the Mint for cut cathodes. In January 1971 provision was made to transfer shipments to the Mint instead of to GSA.

The GSA controls capital expenditures and has the authority to restrict the cash flow of the company. The copper is being delivered at 38 cents per pound. This price was 2 cents in excess of the market price of copper at the time the contract was written. Thus far the price has been substantially below the market in all of its deliveries. Deliveries up through March 15, 1975, have totaled 43,831 tons.

b. **Expansion Program Terminated.**— Because the primary objectives of the Copper Production Expansion Program had been achieved, and since the small balance of remaining funds precluded any significant new production under the program, the OEP concluded on April 15, 1968, that the best interests of the Government would be served by closing out the program and so notified GSA.

4. Conclusion

The contract for the Duval Sierrita mine has again demonstrated the value of a copper contract of this nature. The Government has benefited, copper-producing capacity has been increased, and an expanded mine facility has been put into operation.

5. Reference

Files of Office of Preparedness, General Services Administration.

F. THE NICKEL LOAN OF 1970-71

1. Introduction

The free world lost nearly 200 million pounds of primary nickel production from July to November 1970, when the two major free-world producers of primary nickel were shut down by labor strikes. U.S. availability of nickel fell from more than 28 million pounds to 9 million pounds of primary nickel per month. In its efforts to ease the situation, the Government released in November 9 million pounds of nickel from the inventories of the U.S. mint. These were used to fill defense-rated orders in November and December. This case study tells the story briefly of the nickel acquisition contracts, the stockpile, and the eventual disposal of its contents.

2. Nickel Shortage and Stockpile Release

Even with the strikes settled and the Treasury nickel being shipped to defense consumers, the supply picture was far from adequate. Therefore, the Director of OEP in concurrence with the Secretaries of Defense, State, Commerce, and Interior recommended that the President take action to insure added nickel supplies for common defense purposes. Accordingly, on December 15, 1970, the President, acting under section 5 of the Strategic and Critical Materials Stockpiling Act, released 20 million pounds of nickel for purposes of the common defense.

The release of nickel from the stockpile took the form of a loan rather than a sale, with the arrangements calling for the stockpile to loan nickel to any of the three primary nickel producers. The loans were to be subject to the set-aside provisions of the Defense Materials System and to distribution by allocation for defense-rated orders by the Business and Defense Services Administration (BDSA) of the Department of Commerce.

a. **Contract Accepted by International Nickel Co., Inc. (Inco).**—Three firms were eligible to participate: Hanna Nickel Smelting Co., Kaiser Le Nickel Corp., and the International Nickel Co., Inc. (Inco). However, Hanna and Le Nickel, feeling that they could not comply with the conditions set forth by the Government, dropped out of the program. International Nickel accepted the conditions. These conditions required that—

- The participant would agree to distribute the nickel, in the form received or in an upgraded form, to U.S. consumers of nickel under allocations by BDSA.
- The participant would agree to return all nickel due the U.S. Government before July 1, 1972, the exact schedule to be negotiated by GSA.

- . The quantity a participant must return would be calculated on a value-for-value basis, less processing and handling costs, plus the value of interest earned. The specific handling and processing costs and the rate of interest would also be subject to negotiation by GSA.
- The participant would agree to replace nickel with a higher form than that received from the Government.

The nickel to be loaned was in the form of nickel oxide powder, large cathodes, and briquettes. These forms had been in the stockpile at least 10 years. Produced under older production technology, they were of somewhat lower quality than the nickel used in the industry at the time of the loan. It was planned that when a participant replaced the stockpile nickel, they would replace it with nickel from new production and of higher quality. This would raise the quality of the stockpile and make it more flexible for emergency use.

In accepting the Government's conditions, Inco also agreed to aid the small-business firms injured by the strike by increasing the amount of production made available to plating houses, distributors, and others who distribute to small nickel users.

b. Nickel Shortage Overcome.—Almost 1 year later, representatives of Inco tested the possibility of converting the loan of 20 million pounds of nickel to an outright sale or obtaining a deferral of their repayment deliveries to the stockpile. At the time the company extended this feeler, demand for nickel was high, due to the need for filling pipelines. It was believed that meeting the repayment delivery schedule would place a hardship on the company. Shortly afterward, the nickel shortage turned into an oversupply.

A review of the nickel stockpile objective in December 1970 reduced the stockpile objective to zero. There was therefore no apparent need for the physical return of the loaned nickel.

In anticipation of formal proposal from Inco, several factors were considered. GSA lawyers reviewed the legality of converting the nickel loan to a sale, and decided that if the President desired to convert the loan to a sale, he could do so without any further public announcement. However, it was noted that at the time of the loan there was much publicity about the fact that nickel was being released in one form but would be returned to the Government in upgraded form, thus increasing the national security value of the stockpile. Furthermore, the Director of the OEP, testifying before the Armed Services Committees, had provided specific details on the proposed loan, including the fact that the stockpile would be upgraded by the return of newer nickel. Nevertheless it was expected that an announcement of the zero objective established in December 1970 would remove any serious objections to the conversion of the loan to a cash sale.

c. Nickel Disposal Program.—The disposal program faced a substantial shortfall in its targets for fiscal year 1971, and the estimated \$26 million sale was considered to be an attractive bonus. Furthermore, it would be a positive dollar receipt compared with the uncertain outcome of any later request for necessary disposal legislation from Congress.

Another consideration was the relative importance of maximizing receipts in fiscal year 1971 versus maximizing them in fiscal year 1972, when the final receipt picture could have some impact on the 1972 election campaign. It appeared that the fiscal year 1971 budget was already in a substantial deficit position; as the sale of the nickel would not appreciably alter that position, it was suggested that a White House decision be sought on whether the conversion to sale should be delayed to fiscal year 1972, when the receipts could be used to maximum political advantage.

It was pointed out that a delay in the repayment schedule would present no problem to the Government. Inco would have to continue paying interest on the loan.

d. **Deferral of Nickel Deliveries.** -On December 15, 1970, representatives of Inco met with the director of OEP and members of his staff to review the status of the nickel loan under section 5 of the Stockpiling Act. The company requested approval of a deferral of their deliveries for the period of January to June 1971. In return, Inco would agree to an amendment of the contract which would insure that the Government would not suffer any loss, in either total value or number pounds of nickel. In view of the status of the nickel market at the time and the outlook for the following 3 or 4 years, it was agreed that it would be in the best national interest to permit Inco to defer their deliveries to an added-on time period.

A review of stockpile policy and guidance was underway at the time of the meeting. Because of that and the most recent review of the nickel stockpile objective, it was decided to amend the contract later in the year to permit the government to receive, as it desired, either nickel or cash in repayment of the loan. To calculate the interest costs involved in deferring deliveries from the first one-third time period to an added-on time period, it was agreed that the middle date in each time period would be used.

In general, the company appeared agreeable to doing whatever the Government desired, but indicated a need for planning time if the Government decided on cash payment.

e. **Revision of Payment Terms.**—The GSA and Inco accordingly began negotiating a revision of the repayment terms of the loan contract. On January 14, 1971, Inco representatives stated that the company was willing to convert the first third of the contract to a cash payment. They recognized that the Government wanted to convert the entire contract to cash, but they would not make a commitment on the remaining two-thirds at that time. However, they were sure that Inco and GSA could reach a satisfactory agreement before June 1, 1972. The GSA representatives felt they could reach agreement prior to that date

if they received authority from OEP. The conversion of the contract to cash required three actions: (1) Announcement of the new nickel stockpile objective; (2) Presidential approval of cash repayment; and (3) OEP authorization for GSA to seek cash conversion.

On February 9, 1971, the Director of OEP formally established a zero stockpile objective for nickel. Ten days later he requested the President to amend his instruction of December 15, 1969, to permit a cash repayment rather than replacement of the nickel. The President was advised that if the Government were compelled to take nickel in repayment of the loan, the metal would be excess to the zero stockpile objective. The OEP and GSA would then have to seek congressional authority to dispose of it. On March 5, 1971, the President accepted the Director's recommendations and authorized the acceptance of cash as repayment for all or part of the nickel loaned after December 15, 1969.

The subsequent negotiations between Inco and GSA were successful. The GSA expected to receive over \$28 million in principal and interest prior to July 1, 1973.

f. **Disposal of Excess Nickel.**—During the January 1971 negotiations, Inco sought assurances that reduction of the stockpile objective would not mean Government entry into the commercial nickel market. It was suggested that the OEP could minimize this concern by indicating that any excess nickel would be made available to the U.S. Mint for coinage and that OEP plans at the time precluded any commercial offers excess stockpile nickel.

On February 24, 1971, at the request of OEP, the GSA submitted a plan for selling the balance of the nickel stockpile to the Mint. The OEP accepted and approved the plan and authorized the sale to the Mint of the entire Defense production Act inventory— 2,439,518 pounds of nickel.

On April 5, 1971, the GSA submitted its request for congressional approval of the plan.

On July 26, 1972, the Congress enacted Public Law 92-355, authorizing the GSA to sell the balance of their strategic stockpile of nickel. The sale covered 77,712,878 pounds of nickel from the strategic stockpile. The sales value of the disposal to the Mint amounted to \$119,617,293 for the strategic stockpile nickel, plus \$3,244,559 for the Defense Production Act nickel, for a total of \$122,861,852. The acquisition cost had totaled \$44,711,340,

3. Conclusion

As of this date, the nickel in the defense stockpile has been sold and disposed of. As indicated in the preceding paragraph, the Federal Government showed a profit of approximately \$78 million without taking into account inflationary trends.

4. Reference

Files of Office Preparedness, General Services Administration

G. INTERNATIONAL TIN COUNCIL

1. Introduction

Most of the world's major tin producers and consumers are signatories of the International Tin Agreement, the only formal international commodity agreement for a metal. (The United States has recently signed and submitted to the U.S. Senate for advice and consent to ratification its agreement to the Fifth International Tin Agreement.) Under this agreement, the International Tin Council (ITC) sets floor and ceiling price operating ranges for the ITC buffer stock manager, who buys and sells tin on world markets with the intention of preventing wide swings in world tin prices. The producers make obligatory contributions to the tin buffer stock and are required to impose export control if the ITC deems such action necessary. The combined actions of the buffer stock manager and export controls have prevented prices from going below ITC - established floor prices, but the ITC has been less successful in preventing the price from going above the established ceiling price.

The ITC Agreement was signed or ratified by 20 tin producing and consuming countries and became effective on July 1, 1956, for a 5-year term. The second ITC Agreement came into force on July 1, 1961. Three of the larger consuming nations, the United States, U. S. S. R., and West Germany did not sign or ratify either agreement. The Third Agreement became effective July 1, 1966, and the Fourth

Agreement on July 1, 1971. Because the First ITC Agreement became the model upon which subsequent agreements were reached, some review of its program becomes important.

2. The First International Tin Council Agreement

The stated objectives of the original agreement were (1) to insure adequate supplies of tin at reasonable prices, and (2) to prevent excessive fluctuations in the price of tin. The governing body of the ITC is composed of a representative from each producing and consuming member government. The producing countries have 1,000 votes (5 initial votes for each country) and an additional number proportionate to their consumption. The voting power could be changed to meet changing conditions.

The First Agreement established a floor price of £640 per long ton (80 cents per pound) and a ceiling price of £880 per long ton (\$1.10 per pound). The floor and ceiling prices were raised several times. On December 5, 1963, for example, the floor price was raised to £850 per long ton (\$1.0635 per pound) and the ceiling price was raised to £1000 per long ton (\$1.25 per pound). This agreement further provided for establishing a buffer stock of 25,000 long tons of tin or the equivalent in cash. Contributions (not to exceed 75 percent in metal) of metal or cash were compulsory for producing

countries. Additional voluntary contributions could be made by producing or consuming countries.

a. Pricing Under the First ITC Agreement.—Under the agreement, when the price of tin was at or above the ceiling price, the

Buffer Stock Manager was required to offer tin for sale if he had tin available. When the price was at or below the floor price, the manager was required to buy tin if he had funds. The range between the floor and the ceiling was divided into three sections, as follows:

	Upper range	Lower range	Middle range
£ per long ton	850-900	900-950	950-1,000
Cents per pound	106.25-112.50	112.50-188.75	118.75-125
Manager may	Buy	No action*	Sell

● Unless the Council directs otherwise.

The Buffer Stock Manager bought tin in 1958 in an attempt to support the floor price of \$750 per ton (91.25 cents per pound) until funds (both regular and special voluntary contributions) were depleted in September.

In 1959, the manager liquidated tin acquired by the special fund. The remaining tin was sold in 1961 in an attempt to maintain the ceiling price of £880 per long ton (110 cents per pound).

The manager entered the market briefly in the fall of 1962 to support the floor price of £790 (98.75 cents) and again in 1963 in an attempt to maintain the ceiling price of £965 (120.625 cents).

b. Export Control Authority.—It should be noted that the ITC had an ally in its efforts to contain the price of tin. This was its authority to require its producer members to impose export controls when the situation recommended such action. Thus, export controls by producer member countries were in effect from December 15, 1957, to September 30, 1960. The Buffer Stock Manager was permitted to operate in the middle price range to prevent a sharp rise in the price of tin when the export controls first became effective,

3. The Fourth International Tin Agreement

This agreement became effective July 1, 1971, and will expire June 30, 1976. There are 7 producer members and 20 consumer members. The members and their voting strengths are listed as follows:

Producer countries:	Votes
Malaysia	426
Bolivia	179
Thailand	126
Indonesia	138
Nigeria	45
Zaire (Congo-Kinshasa)	39
Australia	47
	1,000
Consumer countries:	
Japan	204
United Kingdom	147
Germany, Fed. Rep. of	111
France	90
U.S.S.R.	65
Italy	58
Netherlands	45
India	42
Canada	40
Poland	34
Czechoslovakia	34
Belgium	29
Spain	24
Yugoslavia	16
Hungary	15
Denmark	11
Bulgaria	10
Austria	10
Taiwan	8
Korea, Republic of (South)	7
	1,000

a. **Buffer Stocks Under Fourth Agreement.**—The buffer stock of the Fourth Agreement comprised compulsory contributions equivalent in cash or tin metal to **20,000** tons payable by the producing members of the Council on an installment basis. An initial contribution—the cash equivalent of 7,500 tons or £10,125,000 was paid at the inception of the agreement—and from these funds 2,672 tons of tin were acquired from the liquidation of the Third Agreement buffer stock.

Further installments could be called up by the Council from time to time as considered necessary, and the Council could extend to the Executive Chairman the authority to call up funds at short notice. At its second session under the Fourth Agreement, the ITC made use of the new provision and gave authority to the Executive Chairman to call up installments should he consider it necessary for the efficient operation of the buffer stock.

In order to avoid unnecessary retention of funds in the buffer stock, another new provision permitted the Council to make refunds to the producers if the total cash assets of the buffer stock at any time exceeded the total of initial contributions payable and of any voluntary contributions. The revolving nature of the fund, together with the new power both to buy and sell in the upper and lower section, made it possible for the manager to operate with smaller financial resources committed over the period of the agreement.

Two consumer nations, France and the Netherlands, have made voluntary contributions to the buffer stock.

The International Monetary Fund has accepted the Fourth Agreement as consistent with the principles applicable to its buffer stock financing facilities under which the Fund will meet, subject to provisions including the establishment of a balance of payment needs, requests by IMF members for foreign exchange required for financial compulsory contributions to the buffer stock.

b. **Pricing on London Metal Exchange.**—The tin price on the LME governs the participants of the agreement as follows:

- If the market price of tin on the LME is equal to or greater than the ceiling price and the manager has tin at his disposal, the manager is to offer tin for sale on the LME at the market price, until the market price of tin falls below the ceiling price or the tin at his disposal is exhausted.
- If the LME market price of tin is in the upper sector of the range below the floor and ceiling price, the manager may operate on the LME at the market price if he considers it necessary to prevent the market price from rising too steeply provided he is a net seller of tin.
- If the LME market price is in the middle sector of the range between floor and ceiling prices, the manager may buy and/or sell tin only on special authorization by the Council.
- If the LME market price is in the lower sector of the range 'between the floor and ceiling prices, the manager may operate on the LME at the market price if he considers it necessary to prevent the market price from falling too steeply, provided he is a net buyer of tin.
- If the LME market price is equal to or less than the floor price, the manager shall, unless otherwise instructed by the Council, offer to buy tin on the LME at the floor price until the market price of tin is above the floor price or the funds at his disposal are exhausted.

4. The Fifth Tin Agreement

The ITC convened on May 20, 1975, to negotiate a Fifth Agreement to become effective July 1, 1976. The agreement, finalized in June 1975, is set to run 5 years to June 30, 1981.

The major question facing the conference was the method of financing a bigger buffer stock. Producer nations have proposed that the buffer stock be doubled to 40,000 tons and that it be financed by compulsory contributions by consumer and producer nations.

The new agreement, however, provides for compulsory buffer stock contributions by producer nations totaling 20,000 tons to be supplemented by voluntary contributions from consumers of up to an additional 20,000 tons. So far, only France and the Netherlands have indicated their willingness to contribute. Canada, Britain, Switzerland, and Italy have indicated they will consider the proposal. Consideration is also being given to membership by the United States. However, this may create a number of problems for the United States. This will be discussed further below.

The Fifth Agreement also contains a new clause under which the ITC may modify the amount of buffer stock contributions required of members if it obtains outside financial assistance from any international group, such as the International Monetary Fund (IMF).

The IMF presently loans money for use by the ITC to countries with balance-of-payments deficits, but is considering extending credit directly to the Council's buffer stock.

The new agreement also empowers the ITC to recommend that producers give preference to consumer countries which were ITC members during past times of tin shortage. This would act as a deterrent to any of the consumer countries who may consider leaving the ITC because of the requirement to contribute to the buffer stock. It may also be considered as an effort to compel the United States to join the agreement.

5. Position of the United States

The United States has recently signed the Tin Agreement and submitted it to the Senate for advice and consent to ratification. Under the ITA a buffer stock made up of compulsory contributions from producer member-countries and voluntary contributions from a few consumer member-countries is used by a Buffer Stock manager to intervene in the free tin market to try to maintain tin prices within a prescribed range.

The United States, as a condition of its membership in the ITA has insisted that contributions to a buffer stock be the responsibility of producing, not consuming countries, since it is producer-countries that benefit most directly from the stockpile operations. As a further condition of membership, the United States has insisted that disposals from our General Services Administration (GSA) administered strategic stockpile will not be affected by membership in ITA. We have, however, consulted with the Tin Council on our surplus disposals of tin and will continue to do so. The objective of the ITA is to reduce fluctuations of tin prices in international markets; our objective in surplus disposal operations is to assure that they are carried out in a way that will minimize impact upon the commercial markets.

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H. INTERNATIONAL CARTELS

1. Introduction

This review is limited to a discussion of international materials cartels, both existing and potential, as opposed to national cartels operating in individual countries. International cartels are defined as combinations among governments or companies in two or more countries which intend to control the production, pricing, and distribution of a commodity. International commodity agreements, such as the International Tin Agreement, are not considered cartels. Examined in this paper are existing cartels in petroleum, copper, bauxite, and mercury, as well as potential cartels in other mineral raw materials. The International Tin Agreement is covered in a separate case study.

2. Materials Subject to Cartel Action

Listed below are those materials subject to potential cartel action where combinations or unilateral action in restraint of trade could have an adverse effect upon the U.S. economy. Any discussion of potential cartels would cover those materials listed below in which international cartels either exist or could be formed, under conditions favorable to their effectiveness, as well as materials in which cartels are unlikely for the reasons indicated.

Petroleum	Iron ore	Titanium
Copper	Lead	Tungsten
Bauxite	Manganese	Vanadium
Mercury	Nickel	Zinc
Chromite	Phosphate	Tin
Cobalt	Platinum	Natural Rubber

3. Petroleum and the Organization Of Petroleum Exporting Countries (OPEC)

a. Formation of Petroleum Cartel.—

The Organization of Petroleum Exporting Countries (OPEC) was created in 1960. It comprises 12 countries or areas controlling more than two-thirds of total world reserves of

crude petroleum, with the top six members having well over 50 percent of the total. Further, the OPEC members account for more than 85 percent of world trade in oil. The members, their reserves, and daily average production in 1973 are shown in table B-3.

Table B-3.—OPEC members, petroleum reserves, and production

Members	Reserves (Billion bbls)	1973 Production (Million bbls/day)
Saudi Arabia. . .	140.8	7.7
Kuwait.	72.7	3.1
Iran, , , , , . . .	60.2	5.9
Iraq, , , , , . . .	31.2	2.0
Libya.	25.5	2.2
United Arab Emirates.	25.5	1.5
Nigeria.	19.9	2.0
Venezuela , , , ,	14.2	3.5
Indonesia.	10.8	1.3
Algeria.	7.4	1.0
Qatar.	6.5	.5
Ecuador , , , . . .	5.7	.2

Source: Business Week, Jan. 13, 1975

As a combination of governments, OPEC was an outgrowth of combinations of international oil companies, including U.S. firms, which had been in operation for some 30 years prior to 1960. These international oil companies had exercised various degrees of control over Middle Eastern production, partly through price cuts which kept competition out. Nevertheless, these firms had found their market power diminishing in the 1950's and 1960's as smaller independent companies and various state oil units opened up new drilling concessions and gave governments better deals than they were receiving from the established producers. A contributing factor to the weakening of power by the international oil companies was a growing trend towards the nationalization of the petroleum industry in some countries.

b. **Organization of OPEC.**—The creation of OPEC was triggered by price reductions by major producers, which brought angry reactions from oil-producing countries and which were for the most part rescinded immediately after the cartel was formally established. OPEC's bargaining power was limited in the early 1960's by excessive world supply. Nevertheless, despite its slow beginning, various coordinated actions by the group and by individual members gradually strengthened the cartel's hand.

c. **Purpose of OPEC.**—The original purposes of OPEC were economic—to increase member government revenues by raising taxes and royalties earned from crude oil production and to take over from the major international oil companies control over production and exploration through government ownership. Revenue from taxes and royalties collected from producers were tied to so-called "posted prices," which were set solely for the purpose of determining the amount of revenue and did not necessarily reflect selling prices or market values.

d. **Pricing of Petroleum.**—Changes in posted prices have nevertheless served as indications of variations in costs of purchasing crude oil from OPEC members. This has been dramatically true with the sharp increases which were initiated on October 16, 1973, immediately after the start of the Arab-Israeli war and followed up subsequently. Actually the cost of crude oil is based on a combination of both the posted price and tax and royalty rates, and it may vary from area to area, depending on individual OPEC member action. From a posted price at the Persian Gulf of \$3.01 per barrel in August 1973, the level rose to \$5.12 on October 16 and to \$11.65 on January 1, 1974: Prior to October 1973 the posted price had been set by the oil companies, presumably after consultation with OPEC. Subsequently, however, the price increases were unilaterally announced by OPEC. The royalty had traditionally been set at 12 1/2 percent of the posted price. In June 1974 that rate was

raised to 12 1/2 percent by all the Middle Eastern and African countries except Saudi Arabia. For the fourth quarter of 1974 the royalty was generally set at 16 2/3 percent, but on November 1, Saudi Arabia, Qatar, and Abu Dhabi (One of the United Arab Emirates) raised that rate to 20 percent. This action was accompanied by a cut in the posted price by those countries and an increase in the tax rate, with the net result of an increase in actual price of about 50 cents per barrel. Taxes had been set by OPEC at 55 percent of the posted price, less the royalty and production cost, but have been increased and are now about 85 percent in the Persian Gulf countries, but lower in South America,

Further price increases may occur on October 1, following a current freeze. Apparently, increases ranging up to \$4 per barrel are being considered, in order to offset purchasing power presumably lost as a result of inflation. A small increase (about 30 cents per barrel) will also stem from a switch on October 1 from dollar value quotations to Special Drawing Rights (SDR) of the International Monetary Fund, which are based on a weighted group of 16 currencies. The dollar makes up one-third of SDR value.

In a recent (July 1975) action, Ecuador—the smallest OPEC member in terms of reserves and output—reduced its export price through a cut in the income tax rate charged oil producers operating in that country. Although the resulting price decrease is probably less than 50 cents per barrel and Ecuador's participation in OPEC is small, its action may be a straw in the wind, in view of a generally declining trend in petroleum demand and production,

e. **Political Warfare.**—The Arab-Israeli conflict of late 1973 introduced the new element of political warfare through the instruments of export embargoes which were in effect from October 1973 until the spring of 1974 and the sharp price increases which have been put into effect. OPEC has partly achieved its political goals by forcing a hard look at Arab-Israeli relations. Although its economic goals, which concern both Arab and non-Arab

members of the cartel, have also been furthered, the cartel's drastic actions in supply restrictions and price increases have brought reactions which should tend to reduce its long-term effectiveness. The extent of conservation, substitution, and the development of other energy sources not only by the United States but by other import-dependent countries as well will be significant determinants of OPEC's future. The inflationary effect of the price increases was an important factor in the recent recession here and abroad.

f. **Future Policy Decisions.**—As offsetting actions occur, OPEC will be faced with policy decisions which will affect its future. It could cut prices far enough below their present levels to retard production in Alaska and the North Sea, or it can reduce its production by enough to balance the entry of new supplies of oil from those areas. For countries like Venezuela, Ecuador, Iran, Nigeria, Iraq, and Algeria, decreased revenues resulting principally from production cuts would tend to defeat plans for industrial growth or lower their standards of living—both unpalatable political results. For some countries, reduced revenues could affect plans for the growth of military establishments,

Such internal differences and varying political ambitions would have a dampening effect on the solidarity of OPEC. If a mutually acceptable plan cannot be designed, each country may make its own decision about production and price and thus undermine OPEC's effectiveness. On the other hand, those OPEC members like Saudi Arabia and Kuwait, who have the largest reserves but no ambitions for economic growth, would be more concerned about maintaining the long-term strength of the cartel's export market. OPEC's future ability to achieve its goals will depend in part on whether or not its conflicting elements can be reconciled, and in part on the extent to which dependence on OPEC's oil is reduced.

4. Background

a. **The U.S. Position.**—Although the United States is a major world producer of

petroleum, it is dependent upon imports for a substantial proportion of its supply—about 30 percent for crude and 20 percent for petroleum products. Despite the Arab embargo, U.S. imports increased in 1973 and 1974 under pressures of growing demand. The major foreign sources of crude petroleum in 1973-74 were Canada (27 percent of total), Nigeria (15 percent), Venezuela (13 percent), Saudi Arabia (12 percent) and Iran (9 percent). Imports from the 12 members of OPEC accounted for two-thirds of the total. A major breakthrough in output will come, of course, with the completion of the Alaska pipeline, and in Western Europe with North Sea developments. Production from shale is a longer-range prospect.

Petroleum is the source of 46 percent of energy consumed in the United States (1974). Other sources are natural gas, 30 percent; coal, 18 percent; hydropower, 4 percent; and nuclear power, 2 percent. Shifts to these alternative materials raise problems of availability, particularly in the short run. While natural gas has environmental advantages of cleanliness, its supply has been limited due in part to a low-price deterrent to development of resources. A larger supply of coal may be inhibited by environmental considerations, although coal liquefaction and gasification hold some promise. Increased production of nuclear power is part of the longer range program toward greater independence from imported oil. Conservation measures by Government and industry have brought some decline in demand as another phase of the independence drive.

b. **Reserve Oil Supply.**—There is no Government stockpile of petroleum, but recent voting in the Congress indicates that stockpiles will be established. On July 8, 1975, the Senate, without a dissension, voted to create a 90-day national reserve supply of oil as insurance against another Arab embargo. This reserve, to be owned by the Government and stored in underground salt domes, tanks, abandoned mines or surplus tankers, could amount to from 360 million to 785 million barrels, de-

pending on the annual level of imports. The Government would also be authorized to acquire reserves of petroleum products.

The Senate bill, which will be considered in the House, authorized the Government to get its oil from three potential sources: 1) purchases directly on the market; 2) as royalties from wells on Federal offshore oil leases; and 3) from existing naval oil reserves at Elk Hills, Calif.

5. Copper and CIPEC

CIPEC is an abbreviation of Concil Intergouvernemental des Payes Exportateurs de Cuivre—translated as Inter-Governmental Council of Copper Exporting Countries. CIPEC was established in 1967 following a meeting of representatives of Chile, the Congo (Kinshasa)—since renamed Zaire, Peru, and Zambia who met in Lusaka, Zambia, on June 1, 1967, to discuss common problems concerning copper.

Up to the present the membership has consisted of Chile, Peru, Zaire, and Zambia. The Council provides for a ministerial conference which meets every 2 years and an Administrative Council which meets twice yearly in May and November in Paris, and a permanent Information Bureau of Copper in Paris. On occasions special nonscheduled meetings of the Administrative Council have been held. The stated purpose of CIPEC is to act in a consultative manner in helping member countries, individually or collectively, to avoid extreme fluctuations in the price of copper.

a. Effect of Copper Price.—Price fluctuations have only a marginal effect on the quantities of copper exported by the producing countries, but do have a substantial effect on the foreign currency earnings and on the tax receipts of the producer countries. This has a serious effect on the planning for development of these countries. It also gives rise to grave internal political problems. When copper prices—and tax receipts—are high, so are governmental expenditures. When prices

retreat, exporting countries must face a reduction of resources and retrench on expenditures, imports, and investments.

b. Problem of Developing Nations.—Developing countries are seeking national independence. They desire to control the activities of mining enterprises. They want to process minerals as far as possible down the line to manufacturing, in lieu of exporting concentrates and blister for further processing in the consuming centers. Thus, governments in many countries have felt they were under obligation to intervene in health and security matters. Their intervention now extends to such matters as labor conflicts and wages, conservation, currency remittances and utilization, marketing, and pricing policy. In some countries, this indirect control has been supplemented by a direct participation of the state in the capital, and therefore in the management, of the mining companies. Finally, the developing countries, realizing that they cannot become developed nations on the basis of a single commodity, are interested in diversifying their economies.

c. Common Problems.—There are problems common to developing nations including the CIPEC members. CIPEC is not a supranational authority, but rather a consultative body providing the member governments with basic information and opportunities to exchange views and possibly harmonize their own individual and fully independent policies. The principal function of the international staff located in Paris is to gather statistics, provide information on markets, production programs, substitutions, trade barriers, and labor problems and their effects on the copper industry. Toward this end the Information Bureau conducts marketing studies and disseminates reports on world copper developments.

The importance of mine production of CIPEC countries is shown as follows (in thousands of short tons):

	1969	1970	1971	1972	1973
World total	6,281	6,567	6,669	7,329	7,857
Chile	771	756	791	800	819
Peru	219	234	229	248	241
Zaire	393	425	447	472	538
Zambia,	825	754	718	791	779
CIPEC total	2,208	2,169	2,185	2,311	2,377
Percent of world total	36	33	33	31	30
U.S. production	1,545	1,720	1,522	1,665	1,718
Percent of world total	25	26	23	23	22

Source: Minerals Yearbook, Bureau of Mines.

There is an approximate similarity in the economic characteristics of the member countries of CIPEC. All four countries may be called "underdeveloped" or "developing" countries. The population growth rate is substantially higher than that of the United States and other developed countries.

Copper is produced in 60 countries throughout the-world. World production and estimated reserves (in thousands of short tons) are presented as follows:

World copper production

	Mine production		Reserves
	1973	1974 ^a	
United States.	1,718	1,588	90,000
Canada	899	900	40,000
CIPEC countries:			
Chile	819	910	70,000
Peru.	241	240	30,000
Zaire	538	560	20,000
Zambia,	779	760	30,000
CIPEC total	2,377	2,470	150,000
Others:			
Free world	1,683	1,742	95,000
Communist countries ¹	<u>1,160</u>	<u>1,240</u>	<u>55,000</u>
World total.	<u>7,857</u>	<u>7,940</u>	<u>430,000</u>

^aEstimated.

EXCEPT Yugoslavia.

Source: Commodity Data Summaries, 1975; Bureau of Mines.

The United States is almost self-sufficient in respect to its needs for copper. Salient

statistics on copper in the United States for the years 1972–74 are as follows:

	(In thousands of short tons of copper)		
	1972	1973	1974
Production:			
Mine	1,665	1,718	1,588
Refined copper:			
Primary	1,873	1,868	1,620
Secondary	423	465	500
Total,	2,296	2,333	2,120
General imports:			
Blister	157	154	200
Other primary forms	248	244	379
Secondary	11	19	33
Total general imports	416	417	612
Exports:			
Refined	183	189	110
Other primary forms	26	31	23
Secondary, old	45	88	49
Total exports	254	308	182
Shipments from Government stockpiles			252
Consumption: Refined	2,239	2,437	2,300
Price: Average (cents per pound)	51.2	59.5	77.1

Source: Commodity Data Summaries, 1975: Bureau of Mines

d. National Dependence on Copper.—A second characteristic, in somewhat varying degree, is the extreme dependence of each of these countries on copper. This dependence affects the balance of payments, the gross national product, and the Government's budgets. For CIPEC member countries as a whole, copper exports represent a total of 64 percent of their foreign currency entries. The individual percentages vary from 25 percent for Peru, which has a relatively varied economy in which other metals, fishery products, and different agricultural products contribute to a better balance of trade, to over 55 percent for Zaire, over 65 percent for Chile, and 95 percent for Zambia (1967 data). The effect of copper on the member countries' balance of payments may be recognized from the fact that their copper exports pay the total of their imports up to more than 70 percent.

e. Manpower.—The copper industry requires a large investment per employee and

therefore contributes only marginally to the use of manpower. Even so, this contribution amounts to 15 percent in Zambia. The copper industry contributes importantly to the gross national product of Zaire (33 percent) and Zambia (45 percent). In Chile and Peru, where the economies are relatively more diversified, the contribution of copper is significant but not as great as in the African countries,

f. Taxes.—Taxes on copper, including company profits tax, export duties, and royalties, approximate 55 percent of the total tax receipts of Zambia, 45 percent for Zaire, 14 percent for Chile, and 12 percent for Peru (in 1965).

g. Secondary Impacts of the Copper Industry.—The effect of the industry within these countries includes the consumption of goods and services, parts of which are produced in the country itself. Without the copper industry most of these goods and services

would have no market and would therefore not exist. In the case of Zambia, for example, it has been estimated that if these indirect consequences were taken into account, the copper contribution to the GNP would be 50 percent instead of 40 percent, the contribution to Government revenues would be 75 percent instead of 60 percent, and the contribution to employment would be 32 percent instead of 15 percent. Furthermore, income generated in the mining industry in the form of salary, wages, etc., is again spent on goods and services. When this is taken into account, the Zambian figures become 69 percent for the contribution to the gross national product, 84 percent to Government revenue, and 57 percent to total employment.

h. Recent Developments.—Due to a lagging world economy in 1971 and 1972, most minerals and metals were in surplus supply. Prices for these commodities, including copper, were soft and there was little incentive to expand capacity. In 1973, demand for copper suddenly rose and producer's inventories were quickly exhausted.

Domestic and world demand for copper continued strong in the first quarter of 1974. During the months of February through May the balance of the copper stockpile inventory amounting to 252,000 tons of refined copper was released for use by the U.S. Mint. The drawdown of inventories continued and prices were forced up until a record high monthly average of \$1.38 per pound was reached on the London Metal Exchange (LME) during the month of April 1974. However, before mid-1974 there was a weakening of the copper market which continued for the balance of the year. (LME copper prices averaged 57 cents per pound in December 1974.)

Strikes at most producing units in July and August 1974 and reduced demand in the second half of 1974 combined to create a negative effect on the U.S. copper industry. For the year as a whole, the U.S. mine, smelter, and refinery production—and refined copper consumption—were all substantially smaller than

in 1973. Consequently, imports of unmanufactured copper increased significantly, while exports declined.

i. 1974 CIPEC Communique.—This situation was bound to affect CIPEC. Following a 2-day meeting in Paris, CIPEC issued a communique on November 19, 1973, stating that beginning December 1, 1974, its four members would reduce shipments by 10 percent below the levels established in the previous 6 months. (Production was not affected.) The communique also stated that the quota system would be reviewed and adjusted if the 10 percent reduction did not achieve the desired effect on prices. This was the first positive collective action by CIPEC countries to attempt improvement in the price of copper. Early in April 1975 the CIPEC Ministerial Council met in Paris and decided to increase the cut in shipments an additional 5 percent to a total of 15 percent and to cut production as well by 15 percent. These measures became effective April 15, 1975. CIPEC is reported to be seeking support for a producer/consumer buffer stock and to have appealed to the International Monetary Fund for financial help.

CIPEC has also been trying to increase its membership but to little avail. One possibility is Iran which expects to become a substantial producer of copper when the Sar Cheshmeh porphyry copper mine begins production. Although 1977 is the target date, 1978 is more realistic. At full production, future annual output is estimated at 145,000 tons of refined copper per year. Iran has indicated an interest in joining CIPEC.

6. International Bauxite Association

a. Cartel Potential.—Ten countries, including most of the world's major bauxite exporting countries, have formed the International Bauxite Association (IBA) to coordinate information on bauxite production and increase revenues from bauxite operations in member countries. These countries—Australia, Dominican Republic, Ghana, Guinea, Guyana, Haiti, Jamaica, Sierra Leone,

Surinam, and Yugoslavia—produce over 65 percent of the world's bauxite, and account for about 80 percent of the bauxite/alumina trade. The potential for a bauxite cartel thus exists in the structure of the IBA.

b. *The Case of Jamaica.*—Jamaica has taken steps to increase its revenue from the sale of bauxite through increased taxes and most producers appear to be willing to follow its pricing lead. Although Jamaica may press other members of IBA to attempt joint restrictions of supply, no firm pricing and taxation policies have yet been established. A seven-fold increase in Jamaica's revenue from bauxite has resulted in a doubling of its cost to buyers. Most of the other members of IBA are anxious to expand production and gain a bigger share of the export market, and may thus not go along with Jamaica's aims for supply restrictions. Brazil is a nonmember with vast resources of its own, and its plans to increase exports would be counter to any move by IBA to limit output.

c. *Price of Bauxite.*—Even a further doubling of the price of bauxite would add less than 10 percent to the price of aluminum metal. A price increase of this size may lead to only limited substitutions. Although this further doubling would probably have little effect on U.S. bauxite production, the other aluminum-bearing ores might become competitive at that price level.

d. *Stockpile Requirements.*—A recent study by the Office of Minerals Policy Development, U.S. Department of the Interior (March 1975), has estimated optimal government and industry stockpiles of aluminum metal equivalent, in excess of strategic requirements, needed to offset the economic impacts of embargoes and cartel-sponsored monopoly pricing. In terms of aluminum content, the total combined private and Government inventory declared excess of strategic requirements is around 6 million tons. The study finds that this inventory is only about one-fourth to one-fifth the indicated optimum for a

cartel action with a probability close to 1. In order to minimize the costs of certain levels of monopoly pricing policy, the optimal inventory release policy would be impossible. The most that could be hoped for is a credible threat to prevent the cartel from charging full monopoly prices. "Staged sales, perhaps in the amounts in proportion to those which would be sold under an optimal policy, may be required to make the stockpile a more potent weapon."

In another set of calculations the study estimates annual real costs to the U.S. economy of embargoes and cartel price actions, as shown in table B-4.

Table B-4.—Annual real costs to the U.S. economy of a foreign initiated commodity action in aluminum

Million dollars		
<i>Year after beginning of commodity action¹</i>	Embargo	Cartel price actions
1	² 24,500/918	² 20,000/360
2	10,500	6,300
3	8,100	5,400
4	5,600	4,700
5	4,800	3,800
6	4,500	3,200
7	4,100	2,600
8	3,800	1,800
9	3,100	1,100
10 ³	170	160

¹10-year short-run to long-run adjustment period.

²The larger number assumes no release from privately held inventories during the first year of the commodity action. The smaller number assumes private inventories are released at the equilibrium price of (1.1) times the price in the year prior to the commodity action. With an interest rate of 10 percent, this release price will cover the holding cost of a stockpile for one year.

³The 10th year costs would continue for each year after year 10.

e. *Background, Substitutes, and Imports.*—The United States produces about 10 percent of its bauxite requirements. *Imports* come principally from Jamaica (54 percent of the total in 1970–73), Surinam (20 percent), Dominican Republic (8 percent), and Guyana (7 percent). Bauxite is by far the most impor-

tant aluminum raw material produced commercially. About 90 percent of all bauxite is used to make aluminum. There are large domestic deposits of alumina-bearing clays, as well as other aluminous materials, but their production is not yet competitive. Alumina, the intermediate product made from bauxite and processed into aluminum, is also imported to the extent of about one-third of U.S. needs. These imports are chiefly from Australia (49 percent in 1970-73), Jamaica (27 percent), and Surinam (16 percent).

Aside from the substitution of other aluminum-bearing material for bauxite, discussed above, there are possibilities of substitution for aluminum by other materials. Copper, magnesium, stainless steel, and plastic can be substituted to a limited extent, but without identical results and in some cases at higher costs.

The U.S. Government strategic stockpile of metal-grade bauxite totaled 14,158,881 long dry tons on December 31, 1974. The stockpile objective is 4,638,000 tons, leaving an excess of 9,520,881 tons. The total stockpile is equivalent to about 10 months' consumption. The refractory-grade bauxite stockpile is 173,000 tons, all of which is excess. As a result of the completed long-range disposal program for aluminum metal, the stockpile of that material is now zero.

7. The Mercury Cartel

The United States is dependent on foreign sources for a substantial part of its needs for mercury. Net imports have risen from 32 percent of U.S. consumption of primary mercury in 1970 to virtually 100 percent in 1974.⁶ Salient U.S. supply/demand statistics for the 1970-74 period are presented as follows:

Salient statistics—United States

	1970	1971	1972	1973	1974 ^a
Production:					
Mine	27,296	17,883	7,333	2,171	1,700
Secondary	8,051	16,666	12,651	10,329	9,000
General imports	21,672	29,750	29,179	46,076	51,400
Exports and reexports	4,703	7,232	963	342	500
Consumption	61,503	52,257	52,907	54,283	59,600
Price per flask:					
Average N.Y. (duty paid)	\$.407.77	\$292.41	\$218.28	\$286.23	\$290.00
London , ,	\$411.45	\$282.46	\$203.01	\$273.54	\$275.00
Stocks: Consumer and dealer.	12,693	11,489	11,537	14,019	16,000
Employment: Mine and mill	600	350	150	80	80

Import Sources (1970-73): Canada, 53 percent; Algeria, 12 percent; Mexico, 11 percent; Spain, 11 percent; other, 13 percent. Imports in 1974 were 62 percent greater than the 1970-73 average because of the sharp reduction in domestic production. Mexico and Algeria each supplied about one-fifth of the imports, and Canada supplied about one-third.

^aEstimate.

^bIncludes releases by the General Administration of surplus mercury obtained from the Atomic Energy Commission.

World resources of the major mercury deposits of the world are unknown, and only estimates based on production records and geologic knowledge can be made. Reserve and resource estimates for the United States and Algeria were increased significantly during

1974 with the discovery and development of new deposits.

World Mine Production and Estimated Reserves are presented by the Bureau of Mines, as follows:

World mine production and reserves

	Mine production		Reserves
	1973	1974 ^a	
United States.	2,171	1,700	450,000
Canada	12,500	12,000	120,000
Italy	32,315	30,000	400,000
Mexico	28,000	25,000	250,000
Spain	60,076	60,000	2,000,000
Yugoslavia	15,606	15,000	500,000
Other free world, . . .	40,535	36,300	565,000
Communist countries (except Yugoslavia). . .	85,000	82,000	1,015,000
World total.	276,203	262,000	5,300,000

^aEstimated.

a. The Spanish-Italian Cartel.—In 1928, Spanish and Italian producers of mercury controlled over 80 percent of world production. Mercurio Europeo, a cartel of Spanish and Italian producers, was formed October 1, 1928, when world stocks were excessive. Headquarters was at Lucerne, Switzerland. The cartel was formed for the purpose of controlling production, allocating sales, and stabilizing prices. Sales were to deallocated 55 percent to Spain and 45 percent to Italy. Meetings were held annually to allocate world quotas and markets.

Although one of the stated aims of the cartel was to stabilize prices, the actual policy of the cartel was to sustain prices. Less rigid control was exercised over production. Consequently producer stocks increased and by the end of 1930 were estimated to be approximately 150,000 flasks, most of which had been produced but not sold by members of the cartel. As might have been expected, the maintenance of high prices stimulated production in other countries which tended to replace markets formerly supplied by Spanish and Italian producers.

b. U.S. Production.—The largest gain in mercury production occurred in the U.S. mines. In 1931 the U.S. mines were able to supply U.S. requirements for the first time in 14 years and, in addition, had an exportable surplus. In mid-1931 the cartel reduced its price but failed to stimulate buying. However,

in 1932 U.S. production was cut in half. Efforts on the part of the cartel to stimulate consumption were unsuccessful.

c. Cartel Interruptions.—The cartel was suspended in 1936 when it was denounced by Spain who alleged that Italy was selling arms to the insurgents. The cartel operations were resumed in May 1939 following the end of the Spanish Civil War. Operation of the cartel was virtually impossible in World War II, but was revived in 1945.

Spain withdrew from Mercurio Europeo and the cartel was dissolved January 1, 1950, following a large purchase of Italian mercury by the U.S. Government with counterpart funds.

d. Other Competition and Decline in Price.—A group of mercury producers including Algeria, Italy, Mexico, Spain, Turkey, and Yugoslavia, with Canada as an observer, had been meeting informally during the early 1970's to exchange views on market developments and try to formulate a price policy. Efforts by individual members such as Spain and Italy to raise prices by stockpiling had been unsuccessful in the past. In May 1974 the group met in Algiers and decided to form a producers organization. The provisional secretariat announced a minimum sales price of \$350 per flask, FOB., effective May 17, 1974. Although the price briefly reached the an-

nounced minimum price, it has steadily fallen since then.

It is felt that higher prices would likely bring more rapid substitution, especially in battery applications and in the chemicals industry. If prices returned to the levels obtained in 1969, U.S. mine production would probably be resumed, and production would increase in other countries.

8. Chromite

a. Cartel Potential.—The major concern about possible cartel price and supply actions applies to metallurgical-grade chromite. A formal combination of the major sources of this material—the U. S. S. R., Rhodesia, South Africa, and Turkey—for the purpose of controlling markets appears to be a remote possibility because of the political differences among them. However, supply restrictions by a Rhodesian-South African cartel might find tacit cooperation of the U.S.S.R. On the other hand, technological developments in the use of chromite, which permit the use of South African chemical-grade ores in metallurgical

applications, have reduced U.S. dependence on the U.S.S.R. and Rhodesia for metallurgical-grade chromite.

b. Recent data.—A recent study of the Office of Minerals Policy Development, U.S. Department of the Interior (March 1975), has made estimates on optimal industry and Government stockpiles under varying degrees of probability of an embargo by exporting countries or of cartel-sponsored monopoly pricing. Estimates have also been made of real costs of embargoes and monopoly pricing. Tables B-5, B-6, B-7, and B-8 present these findings of the study,

c. The U.S. Deficiency.—The United States had produced no chromite (chromium ore) since 1961. While large amounts of chromium-bearing materials are found in this country, they are low-grade and uneconomical to develop under current and foreseeable costs and technology. The major use of chromite is in the manufacture of stainless steel (66 percent of the total in 1971). The other uses are

**Table B-5.-Estimated real cost
of a chromium embargo**

Years of embargo (t)	Annual cost (millions of dollars)	Present value of cost (millions of dollars)
1	273	248
2	963	796
3	799	601
4	789	540
5	632	393
6	533	301
7	495	254
8	461	215
9	412	175
10	374	144
Subtotal years 1-10	5,731	3,667
Plus \$374 million in each additional year up to and including the 24th year, thereafter, alternative unit costs exceed long-run price.		
Subtotal years 11-24	5,236	1,061
Tot al years 1-24	10,967	4,728

Table B-6.—Optimal chromium stockpile in an embargo situation

[Thousands of short tons]

Year of embargo	Probability of occurrence				
	1	0.2	0.1	0.05	0.01
1 , , , , ,	247	240	231	215	81
2 , , , , ,	521	501	479	435	69
3 , , , , ,	516	313			
4 , , , , ,	512	225			
5 , , , , ,	508				
6 , , , , ,	502				
7 , , , , ,	498				
8 , , , , ,	489				
9 , , , , ,	477				
10 , , , , ,	460				
11 , , , , ,	444				
12 , , , , ,	426				
13 , , , , ,	407				
14 , , , , ,	385				
15 , , , , ,	362				
16 , , , , ,	336				
17 , , , , ,	308				
18 , , , , ,	277				
19 , , , , ,	243				
20 , , , , ,	205				
21 , , , , ,	163				
22 , , , , ,	118				
23 , , , , ,	68				
24 , , , , ,	12				
Total.	8,484	1,279	710	650	150

Table B-7.—Estimated real cost of a chromium cartel action

Years of cartel (t)	Annual cost (millions of dollars)	Present value of cost (millions of dollars)
1 , , , , ,	203	185
2 , , , , ,	625	517
3 , , , , ,	556	418
4 , , , , ,	523	358
5 , , , , ,	456	283
6 , , , , ,	408	231
7 , , , , ,	365	187
8 , , , , ,	326	152
9 , , , , ,	288	122
10 , , , , ,	250	97
Subtotal years 1-10	4,000	2,550
Plus an annual cost of \$250 million in each additional year up to and including year 17. Thereafter, alternative unit costs exceed the monopolistic price,		
Subtotal years 11-17	1,750	470
Total years 1-17	5,750	3,020

Table B-8.—Optimal stockpile in a chromium cartel situation

[Thousands of short tons]

Year of cartel	Probability of occurrence				
	1	0.2	0.1	0.05	0.01
1 .. , , , , ,	247	240	231	215	
2 .. , , , , ,	484	464	443	403	
3 .. , , , , ,	480	445	403	320	
4 .. , , , , ,	476	428	369	248	
5 .. , , , , ,	471	393	293		
6 .. , , , , ,	466	352	205		
7 .. , , , , ,	462	296			
8 .. , , , , ,	453	291			
9 .. , , , , ,	441				
10 .. , , , , ,	425				
11 .. , , , , ,	410				
12 .. , , , , ,	393				
13 .. , , , , ,	374				
14 .. , , , , ,	354				
15 .. , , , , ,	331				
16 .. , , , , ,	307				
17 .. , , , , ,	279				
Total . . .	6,853	2,909	1,944	1,186	

refractories (19 percent) and chemicals (15 percent).

Imports of all grades in 1974 came from South Africa (30 percent of the total), U.S.S.R. (29 percent), the Philippines (17 percent), Turkey (11 percent), Rhodesia (7 percent), and Albania (6 percent). One of these countries, Rhodesia, was out of the picture during 1967-71, when imports were halted by the United States in support of U.N. sanctions against that country. The resultant heavy dependence on Russian chromite was eased beginning in late 1971, when imports from Rhodesia were resumed.

d. Processing and Use.—For metallurgical purposes, in the production of stainless steel, chromite is processed into ferrochrome. While much of this processing had been performed in the United States, increasing quantities are being produced overseas, largely in ore-producing areas. This shift is reflected in significant increases in U.S. imports of high-carbon ferrochromium over the last 5 to 6 years. Consumption has also risen as a result of shifts toward use of this grade, though not to the same extent as the rise in imports. In

1973 and 1974 imports of this commodity were 13 times as large as in 1968, and now account for 70 percent of all ferrochromium imports. Imports of the low carbon grade have fluctuated and were actually lower in 1974 than in 1967. Of total imports of both grades, South Africa was the principal source (37 percent of total), followed by Rhodesia (23 percent) and Yugoslavia (13 percent).

e. Use in Stainless Steels.—Chromium is an indispensable ingredient of stainless steel. Possible substitutes for stainless steel in some applications include aluminum, nickel, and titanium or alloys of these metals with other elements. Chromium used as an alloy in the production of steels other than stainless and in high-temperature metals may be substituted fully or in part by cobalt, nickel, molybdenum, or vanadium, but usually with lower performance standards or higher costs. Chromium used in plating can be replaced by nickel, zinc, and various other metals. Substitutes are also available for chromium used in pigments.

f. Stockpile Composition.—Chromium is stockpiled by the Government in various

forms: three grades of chromite, three grades of ferrochromium and chromium metal. As of December 31, 1974, stockpile surpluses were as follows, in relation to U.S. consumption in 1973: metallurgical-grade chromite, 26 months' supply; refractory-grade chromite, 15 months; chemical grade, 14 months; low carbon ferrochromium,¹ 25 months; high carbon ferrochromium, 18 months; ferrochromium silicon,¹ 8 months; and chromium metal¹, 8 months.

9. Cobalt²

With approximately two-thirds of the world cobalt production, Zaire clearly is in a position to increase world cobalt prices by artificially manipulating the supply. Such action, however, is unlikely because cobalt is a byproduct of other mineral production. Nickel can be substituted for cobalt in a number of important uses, and the large U.S. stockpile is a standing threat to cobalt producers.

10. Iron Ore

There have been no concerted moves by producers to use or control international iron ore trade. Furthermore, a sustained iron ore producers' cartel for the purpose of increasing prices appears unlikely because of the abundance and wide distribution of iron ore reserves. World iron ore production is expected to remain 20-25 percent below capacity for at least several years. And with 85-90 percent of the world's iron ore produced from open pits, large increases in ore production can be achieved within 1-2 years.

a. The Caracas Group.—The less-developed countries (LDC) iron ore producers (Liberia, Brazil, Venezuela, and others) stated their view at UNCTAD that iron ore prices should be linked to those of steel, but nothing

has yet come of this idea. An informal LDC group, known as the "Caracas Group," has held a series of meetings to discuss iron ore prices. Its last meeting was in Geneva in March, with Australia, Canada, and Sweden attending as observers. The meeting dealt mainly with technical aspects of production, transport, and trade and did not consider possible action to improve prices or to restrict supplies, nor did it act on proposals for establishing a more formal structure,

In May 1974 Venezuela announced its intention to nationalize the iron ore operations there. Under Government ownership and control, Venezuela may well attempt to obtain higher prices for its iron ore exports, within the limitations of the existing competitive situation, whether or not there is a subsequent move to secure joint producer action. The Government may also limit exports and channel supplies to its growing domestic steel industry and to other members of the Latin American group, called the Andean Pact.

A "worst case" scenario might be the simultaneous closing down of the Great Lakes iron ore facility, a limiting of Venezuelan exports, and a prolonged labor strike in Canada, a series of events which would affect 33 percent of U.S. iron ore consumption.

b. Possible First U.S. Action.—The first reaction of the United States could be to attempt short-run supplementation of ore supplies from presently operating surplus capacity. Other reactions would include: attempts to secure new domestic sources and to open up new mines abroad (2.7 years' lead-time); relaxation of environmental constraints; conservation of steel and substitution to the extent practicable; and an embargo on exports of scrap iron.

c. Use of Low-Grade Ores.—It should be noted, however, that bringing new domestic sources of iron ore on stream entails significant costs. We would be mining lower grade ore, thereby necessitating more energy in the furnaces, more pollution control, and probably

¹Zero objective.

²Reference. The following statements, dealing with the potential for cartellike action to restrict supplies or raise prices for a number of other materials, are taken verbatim from the Special Report-Critical Imported Materials, published by the Council on International Economic Policy, December 1974.

additional transportation facilities to reach remote supply sources.

Aside from the possibility of a sudden disruption resulting from the unilateral nationalization of U.S.-owned iron ore production facilities abroad, there are no impending supply problems for the United States. There is a nebulous group which conceivably could be encouraged by an appearance of success in other commodities to coalesce into operating as a price-hiking cartel. To be effective, the cartel would have to include Australia, Brazil, and Canada. Although these three countries are currently more favorably disposed toward international producer organizations, their wider interests compel policies of moderation in questions of pricing of and access to their mineral resources. The sheer volume of imported iron ore, and the lack of substitutes or reserve stocks, make this commodity a critical one to watch.

11. Lead

Price gouging would have to involve both Canada and Australia and this is unlikely, given the current policies of these countries. Several factors, however, suggest that a significant price increase in lead is a possibility: (1) due to environmental standards the future earnings potential of lead may be dim; the temptation to reap immediate profits, great; (2) there are few economic substitutes. On the other hand, because the dependence of foreign producers on lead for foreign exchange is small, there is little interest of individual producer countries in joint market action to obtain higher prices. Moreover, producers may feel that higher prices will discourage new uses of lead.

In the short run there might be some temptation to gain higher profits from lead due to its relatively dim future. If a cartel were formed, it would have to involve developed countries. The United States currently produces 75 percent of its lead requirements and could become self-sufficient within 54 years.

The likelihood of a joint price-gouging effort is low. And without a cooperative effort

to control production, the attempt to sustain high prices would be difficult if not impossible.

12. Manganese

An effective manganese cartel would, at the minimum, require the cooperation of Gabon, Brazil, South Africa, and Australia. Such action could take the form of a price leadership group of Brazil, Gabon, India, and Australia, with South Africa and the U.S.S.R., following the "lead. For political reasons, South Africa might be unwilling to join an LDC producer group. Before joining with others to restrict exports to raise prices, Australia would have to consider carefully the effect of such actions on its other exports to Japan, particularly iron ore, for which Japan is by far Australia's most important market. Iron ore is in plentiful supply worldwide, and an Australian move to restrict manganese exports could possibly result in a gradual Japanese shift in iron ore sourcing to "more stable" suppliers. The same constraint is true for India, which exports both manganese and iron ore to Japan. Finally, Brazil is a substantial iron ore supplier to Western Europe, where continued available markets for iron ore might be threatened by a cutback in manganese exports. Supply restrictions or price-manipulating efforts would likely be frustrated within a 2-to-3 year period by production and capacity expansion by others—to the long-term detriment of the restricting producers. Price increases would also add impetus to seabed recovery of manganese nodules.

13. Nickel

The potential for cartel-like action to raise prices or restrict supplies is quite limited. It appears that prices have already reached cartel profit-maximizing levels. A formal cartel of producing governments acting jointly probably would not revise the present pricing strategy to any considerable extent. Moreover, the possibility of new producers (including seabed producers) in the next few years would make any market-sharing agreement by a cartel both

difficult and unstable. Over the long run, these developments make the probability of price declines substantial.

14. Phosphate

The conditions for a cartel action are present: supply and demand are not responsible to price in the short run, there is a lack of substitutes for the crucial agricultural applications, there is no excess capacity, and there are only a few producing countries. The price of phosphate rock will rise, cartel or not.

15. Platinum

With only five significant producers of primary platinum operating in three countries, the potential of collusive pricing behavior is fairly high. But because of the following factors, one might conclude that platinum is already priced at or near optimum levels:

- . Despite marginal costs of production (believed to be only half or less of recent market prices), major producers appear to withhold stocks from the market to maintain what resembles a long-run profit maximizing price.
- . Despite tremendous gyrations in the dealer price of platinum, major producers have for many years supported a stable producer price.
- . Producers have admitted to holding down prices to prevent more intensive efforts to develop platinum substitutes.

It thus appears that the platinum producers already cooperate to regulate both supply and price. The potential for further action therefore seems to be present.

a. Substitutes for Platinum.—The basic force opposing action detrimental to the United States or other consumers appears to be apprehensiveness on the part of producer companies concerning the development of substitute materials or processes which do not require platinum. There are also indications that there are substantial inventories in the hands of the major users.

Other materials or processes could be substituted for the use of platinum catalysts in the petroleum refining and chemicals, but this would be a lengthy and expensive endeavor. Short-term reactions could include the release of stockpile materials and the allocation of available supplies, including excess industrial inventories to the more essential uses.

b. Few Platinum Suppliers.—The possibility of supply withholding or drastic price increases is present because of the small number of suppliers, demand which is relatively insensitive to price, and the lack of ready substitutes. Concerted intergovernmental action would not be necessary; price leadership by one platinum producer and the tacit cooperation of others would be sufficient. However, the history of the industry, including the recent undertaking by the major producer to increase production to fill contracts with U.S. auto manufacturers, indicates a sensitivity by the producers to market needs and a willingness to fill them.

16. Titanium

With the considerable world ilmenite production and the numerous present producers, a concerted producer country action to increase ilmenite prices artificially would appear difficult. Although higher prices for Australian minerals and raw materials is a major goal of its Labor Government, Australia, which has 97 percent of the non-Communist world's rutile production, would have to "go it alone" in any market action on rutile production, rather than taking the politically easier step of "giving in" (willingly or unwillingly) to LDC requests for Australian cooperation in a market action. Given Australia's strong political and economic ties to the West, it is doubtful she would be willing to take such action alone. Nevertheless, the Australian rutile producers seem to have jointly been making price and output decisions to extract as much long-run profit as they could; however, if these producers feel they have not fully exploited their situation, further price increases may be forthcoming.

The chances of significant artificial price increases in titanium involve developed countries and the possibility of such action is negligible. In any case, the economic impact on the United States would not be significant. In the longer run, the development of substitutes for rutile seems promising.

17. Tungsten

Because of what appears to be a dwindling reserve situation, and given the lack of available substitutes, tungsten is a possible candidate for short-term price manipulation, although Canada and Australia would have to be involved to make a cartel effective.

While we are dependent at present on imports, the dependence is more a matter of current price situation than necessity. Given the possibilities for substitution, the existing stockpile levels, and the domestic reserves, it does not appear that the United States can be threatened by either embargo or price actions on the part of foreign tungsten producers for many years.

18. Vanadium

The only possibility would be a unilateral price increase by South Africa. A significant increase could be frustrated by substitutes: columbium has, in fact, been replacing vanadium in steel-alloying applications over the past 2-4 years, and other alloying elements, such as molybdenum, are also replacements at higher prices. Nevertheless, the United States imports all its columbium.

19. Zinc

A "Producers Group," including virtually all West European, Canadian, and Australian privately owned producers, is apparently trying to establish prices and operating rates to maintain price stability at a level satisfactory to the members. In view of current production magnitudes and potential, a group attempting to establish firm control of the world zinc market would probably have to include Australia, Canada, Mexico, the European

Community, Zaire, and Zambia. A zinc cartel would therefore require the close cooperation of highly disparate private-sector entities. It might also run afoul of the European Community's antitrust regulations,

Most foreign producers realize the value of the U.S. market and thus are likely to avoid moves which could lead to greater U.S. production. Given this fact, the diffusion of sources, the countries involved, and the eventual availability of certain substitutes, it is unlikely that price gouging or cartel-like action will occur. What we can expect is that the major zinc producers will try to tailor their output and expansion plans to try to avoid creation of all oversupply and falling prices, such as was experienced during the 1960s and early 1970's.

20. Tin

Most of the world's major tin producers and consumers are signatories of the International Tin Agreement (ITA), the only formal international commodity agreement for a metal, (The United States has recently signed and submitted to the U.S. Senate for advice and consent to ratification its agreement to the Fifth International Tin Agreement.) For a detailed discussion of the ITA see Case Study, The International Tin Council. Under this agreement, the International Tin Council (ITC) sets floor and ceiling prices and its buffer stock manager buys and sells tin on world markets with the intention of preventing wide swings in world tin prices. The producers make obligatory contributions to the tin buffer stock and are required to impose export controls if the ITC deems such action necessary.

a. Tin Agreements.—Four sequential Tin Agreements have been in operation since 1956. Over their life, the combined actions of the buffer stock manager and export controls have prevented prices from going below ITC-established floor prices. The ITC has been less successful in preventing the price from going above the established ceiling price. Since November 1973 the world tin price has ex-

ceeded the ceiling price, despite the fact that the buffer stock manager has disposed of about 40,000 tons from the U.S. stockpile,

Price gouging on the part of tin producers is deemed unlikely. Under the terms of the ITA, to which all of the major producers belong, one of the objectives is to increase production in case of a tin shortage and make a fair distribution to tin metal consumers in order to mitigate serious difficulties which consuming countries might encounter. To restrict supplies would run counter to the agreement and jeopardize the upcoming negotiations for the Fifth Agreement. Moreover, the producers are quite concerned about the potential sales from the U.S. stockpile. Substitutes and the potential for conservation of tin in solder make long-run prospects for cartel-like action poor.

b. *Cartel Activity not Expected.*—The present price of tin is higher than even many of the tin producers believe can be sustained. A more likely possibility is that producers, acting through the International Tin Agreement, will move to ensure that prices do not drop to previous low levels. They will attempt to accomplish this by significantly raising the present floor price in the tin agreement,

21. Natural Rubber

There is an international organization, the International Rubber Study Group (IRSG), comprising producers and consumers of both natural and synthetic rubber, including the United States. This organization has not acted to control supply or price, but it has served mainly as a forum for discussion of the problems of the rubber producers. Because of dissatisfaction with the IRSG ability to solve the low-price problems, the Southeast Asian producing countries, led by Malaysia, formed the Association of Natural Rubber Producing Countries (ANRPC) in 1971. Thus far, the association has concentrated on technical matters, although the members have discussed the

possibilities of joint action in regard to natural rubber marketing, freight rates, and stockpiling natural rubber.

The natural producers have never tried to curtail production to advance higher prices, but the Malaysian Government attempted to influence the market by buying rubber in 1971 and 1972 and by suggesting in July 1974 that producers temporarily hold larger stocks until the price decline had been reversed. The natural-rubber producers have been sensitive to the political and economic problems that curtailed production would entail; e.g., widespread rural unemployment and hardship for small family-operated plantations. Nevertheless, since natural-rubber production capacity cannot be expanded rapidly, exporting countries could sustain price increases for a few years.

It is unlikely that the natural-rubber producers will withhold supplies from the market for long, but led by Malaysia they may attempt to obtain greater control over world marketing of natural rubber. However, even if this is achieved, they are not likely to be able to sustain any price gouging effort because of the availability of synthetics,

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