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Survey of United States Uranium Marketing Activity

May 1978

U.S. Department of Energy
Assistant Secretary for Resource Applications
Division of Uranium Resources and Enrichment

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NOTICE

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SURVEY OF UNITED STATES URANIUM MARKETING ACTIVITY

Introduction

As part of a continuing assessment of uranium procurement for nuclear power plants in the United States, the Supply Evaluation Branch of the Division of Uranium Resources and Enrichment of the U. S. Department of Energy (DOE) has completed a survey of U. S. uranium marketing and procurement in 1977. Reports on uranium marketing activities have been published since 1968. These surveys were previously performed by the Energy Research and Development Administration and its predecessor, the Atomic Energy Commission.

Information for the present survey was received from 65 of the 67 utilities with nuclear reactor projects, 36 present or potential uranium producers, and 5 reactor manufacturers. The information provided by these respondents provides virtually complete coverage of U. S. uranium marketing activities. A list of respondents is presented in Attachment A.

The survey requested data on domestic uranium purchase commitments, uranium imports and exports, unfilled requirements, U_3O_8 supply available for sale, inventories of domestic- and foreign-origin uranium, and prices for existing contracts between domestic primary producers and domestic buyers. Information on actual and planned capital expenditures for uranium production facilities, also gathered in the survey, was reported in a DOE Information Release on May 1, 1978, (No. R-78-155).

Purchase Commitments of Domestic Uranium by U. S. Buyers

As shown in Table I, U. S. primary producers and U. S. buyers made additional contract commitments during 1977 for 12,000 tons of domestic-origin U_3O_8. These new commitments were offset by a net 500-ton reduction in January 1, 1977, commitments (previous contracts). The resulting net additional procurement of 11,500 tons is much lower than the 83,400 procured in 1976. However, procurement in 1976 was by far the highest of any year.

TABLE I

DOMESTIC COMMERCIAL URANIUM DELIVERIES AND COMMITMENTS[1/]
AS OF
JANUARY 1, 1977 AND JANUARY 1, 1978

	Tons U_3O_8
Past Deliveries Plus Forward Commitments (1/1/77)	289,200
Changes During 1977	
Total New Purchases	12,000
Changes to 1/1/77 Commitments[2/]	(500)
Net Change	11,500
Past Deliveries Plus Forward Commitments (1/1/78)	300,700
Deliveries:	
Prior to 1977	(93,800)
During 1977	(13,900)
Forward Commitments (1/1/78)	193,000

1/ Commitments between primary producers and user; transfers between producers or between buyers are not included.

2/ Primarily the sum of reductions due to resolution of litigation and additions of optional deliveries of contracts made prior to 1977.

TABLE II

URANIUM DELIVERY COMMITMENTS
DOMESTIC PRIMARY SOURCES TO DOMESTIC BUYERS
TONS U_3O_8

Year of Delivery	Annual		Cumulative	
	As of 1/1/77	As of 1/1/78	As of 1/1/77	As of 1/1/78
1966-1976	---	---	93,800	93,800
1977	15,900	13,900	109,700	107,700
1978	17,900	19,100	127,600	126,800
1979	18,400	17,700	146,000	144,500
1980	20,400	19,600	166,400	164,100
1981	19,000	19,600	185,400	183,700
1982	19,200	19,500	204,600	203,200
1983	15,000	17,000	219,600	220,200
1984	13,000	13,000	232,600	233,200
1985	11,500	11,700	244,100	244,900
1986	8,400	9,100	252,500	254,000
1987	7,200	8,800	259,700	262,800
1988	6,400	7,900	266,100	270,700
1989	6,400	7,500	272,500	278,200
1990	5,200	6,400	277,700	284,600
1991-2000	11,500	16,100	289,200	300,700

Includes optional quantities - see Table III

Domestic Uranium Commitments to Domestic Buyers

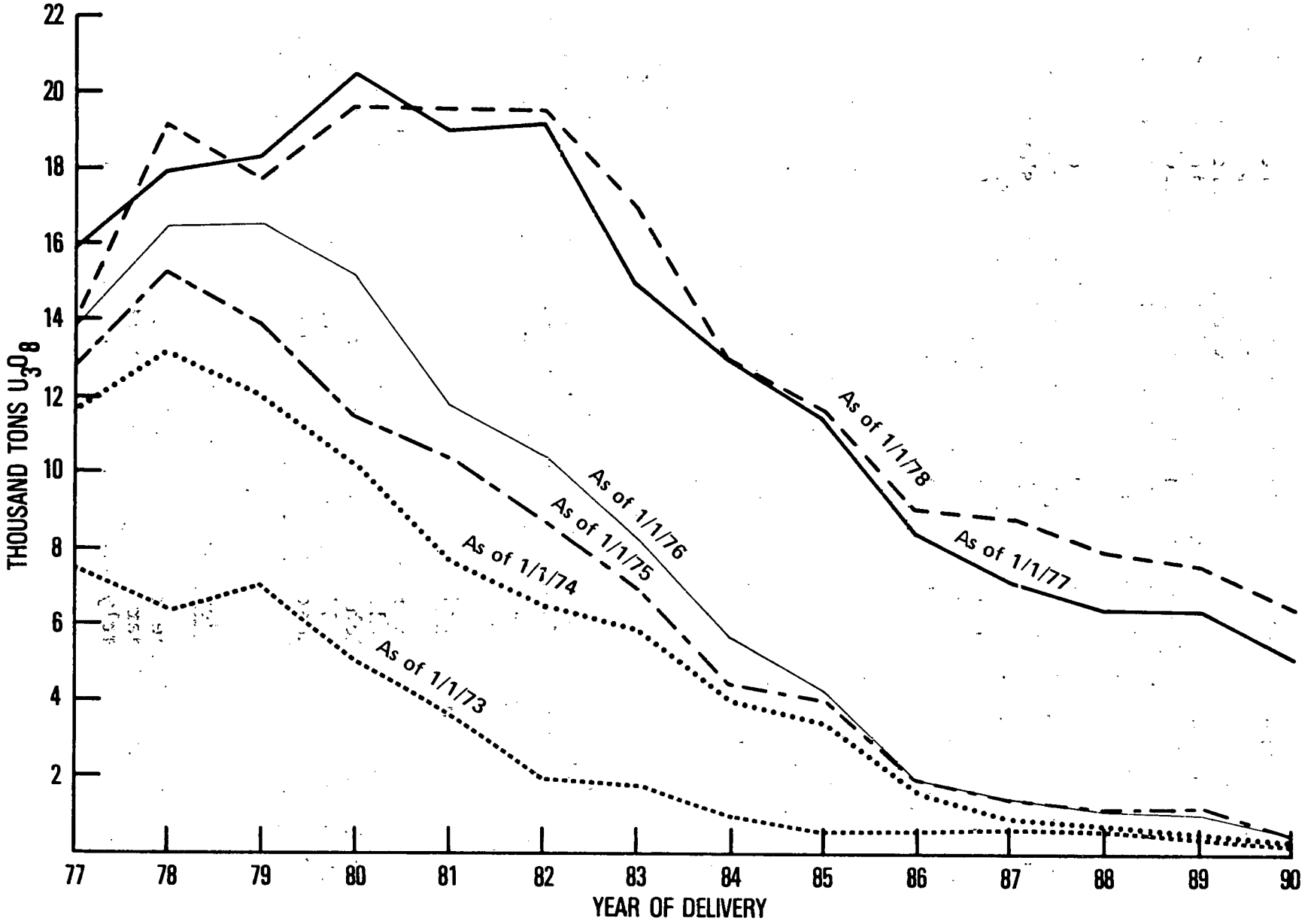

Figure 1

The net reduction to 1/1/77 commitments was the result of additions to and subtractions from then existing contracts. The additions included optional deliveries not previously reported and increased delivery quantities to prior contracts. These "additions" are distinguished from "new purchases" since they do not constitute a new procurement. The subtractions resulted primarily from resolution of litigation.

Reported annual delivery commitments of domestic-origin uranium from domestic primary producers to domestic buyers as of January 1, 1978, and January 1, 1977, are shown in Table II. Actual deliveries reported for 1977 were 2,000 tons less than reported as of the beginning of 1977. This downward revision follows a pattern evidenced in previous years where actual deliveries are less than scheduled at the beginning of the year.

On a cumulative basis, delivery commitments as of January 1, 1978, are lower than those of January 1, 1977, through 1982. Most of the net increases to commitments are for delivery after 1985. Although the post-1985 additions committed during 1977 are not as large as those committed during 1976, they represent, historically, the second largest procurement increase for this period.

Figure 1 graphically compares annual delivery commitments for the 1977 to 1990 period reported by domestic producers and buyers as of January 1, 1973, 1974, 1975, 1976, 1977, and 1978. Besides illustrating the distribution of the additional net procurement over the 1978-1990 period during 1977, the graph also points out that there were net decreases in delivery commitments for three years (1977, 1979, and 1980) between 1/1/78 and 1/1/77.

Optional Uranium Deliveries

This year's survey requested separate reporting of optional deliveries. Scheduled optional uranium deliveries are listed in Table III, which represents a subset of the quantities reported in Table II. About 1,800 of the 6,600 tons under option were included in the 1/1/77 commitment data and although the remaining 4,800 tons were not previously reported, they were in existence as of 1/1/77.

Uranium Supply Under Litigation

It is our practice to include data on delivery commitments for contracts under litigation unless it appears that the uranium will clearly not be delivered. On the other hand,

TABLE III

OPTIONAL URANIUM DELIVERIES
DOMESTIC PRIMARY SOURCES TO DOMESTIC BUYERS
TONS U_3O_8

Year of Delivery	Annual	Cumulative
1978	200	200
1979	300	500
1980	800	1,300
1981	600	1,900
1982	400	2,300
1983	900	3,200
1984	800	4,000
1985	600	4,600
1986	600	5,200
1987	600	5,800
1988 on	800	6,600

we do not include prices of material under litigation in our computations of average prices. This practice follows from the fact disputes are more likely to involve pricing problems than the quantities to be delivered. As litigations involving uranium delivery and price disputes are resolved, additional adjustments may be necessary.

Uranium Prices

In past surveys, the average prices we have reported were based exclusively on prices of contracts where price and means of escalating this price are determined at the time the contract is signed ("contract price" procurement). In the last several years, use of "market price" contracts has increased considerably. In this type of contract, prices are determined at or sometime before time of delivery based on prevailing prices.

Table IV, Column 2 shows the average reported prices for contract price and, where available, settled market price commitments. Market price settlements are included with "contract prices" since, as settled prices, they are similar to "contract prices." This procedure also provides the best available overall average price for actual 1977 deliveries. The average 1977 price was $19.75 per pound compared to $17.20 reported as of July 1, 1977[1/] and $15.00 reported as of January 1, 1977.[2/]

Since most market prices contain base (or floor) prices which provide a lower limit on the eventual settled price, this survey requested and is reporting data on base prices (Table IV, Column 4). These average base prices, ranging from $34.30 in 1978 to $54.55 in 1985, are approximately 2-2½ times as high as the average prices reported in Column 2, and are closer to prices for new procurement.

The average prices in Table IV are in terms of year-of-delivery dollars. Thus, the prices reflect buyers' estimates of escalation as appropriate for their contracts. Also shown in Table IV are the percentages of annual commitments or deliveries for which price data were reported. Thus, in 1978 prices were reported for 80 percent of the total of

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1/ ERDA Release No. 77-176, "ERDA Reports Results of Uranium Price Survey."

2/ ERDA 77-46, "Survey of U.S. Uranium Marketing Activity," May 1977.

TABLE IV

AVERAGE OF CONTRACT PRICES AND SETTLED MARKET PRICE CONTRACTS, AND AVERAGE BASE PRICES OF MARKET PRICE CONTRACTS

Year	Average of Contract Prices and Settled Market Price Contracts		Average Base Prices of Market Price Contracts	
	Price Per Pound of U_3O_8 (Year-of-Delivery Dollars)	Percent of Commitments for Which Prices Were Reported	Price Per Pound of U_3O_8 (Year-of-Delivery) Dollars)	Percent of Market Price Commitments with Base Prices for Which Prices Were Reported
1977	19.75*	80*	---	--
1978	17.40*	93*	34.30	86
1979	16.65*	90*	41.10	82
1980	18.50	91	44.55	81
1981	22.60	84	46.95	79
1982	24.10	93	47.20	73
1983	22.70	82	49.50	86
1984	22.90	86	51.55	82
1985	25.40	84	54.45	80

* Includes price settlements of market price contracts.

contract price and settled market price commitments. In general, the percentages of reported prices for contract price and market price settlement deliveries, ranging from 80 to 93 percent, are higher than those for base prices of market price contracts, 73 to 86 percent. However, in both cases the percentages are sufficiently high for the data to provide a good representation of prices.

Distribution of Prices

Figure 2 depicts, in $5 increments, the annual price distribution of contract price commitments (along with settlements of market price contracts) for the 1977-1985 period. Those increments covering 15 percent or more of any year's delivery commitments are shaded. It can be seen in Figure 2 that most contract price commitments are at prices below $20 per pound. The large percentage of procurement at prices above $40 per pound in 1977 was a result of market price settlements and spot purchases during that year.

The annual ranges of base prices of market price contracts are shown in Figure 3. The majority of the lower limits for the base price ranges are above $35.

Price Settlements of Market Price Contracts

In order to report more completely on the current uranium market, the survey asked uranium buyers to provide information on settlements of prices for any market price contracts they have. Prices of all the uranium delivered under market price contracts in 1977 would have been settled, as well as portions of the 1978 market price delivery commitments.

Market Price Settlements

Year of Delivery	Average Price $ Per Pound U_3O_8	Tons U_3O_8
1977	41.50	800
1978	43.95	1,100

The reported 1977 average market price settlement represents 71 percent of the reported quantity of settled market price contracts for that year. The corresponding figure for 1978 is 93 percent. The 1978 price is about 6 percent higher than the 1977 price. Both prices are in year-of-delivery dollars.

DISTRIBUTION OF U_3O_8 PRICES, 1/1/78 CONTRACT PRICES & MARKET PRICE SETTLEMENTS

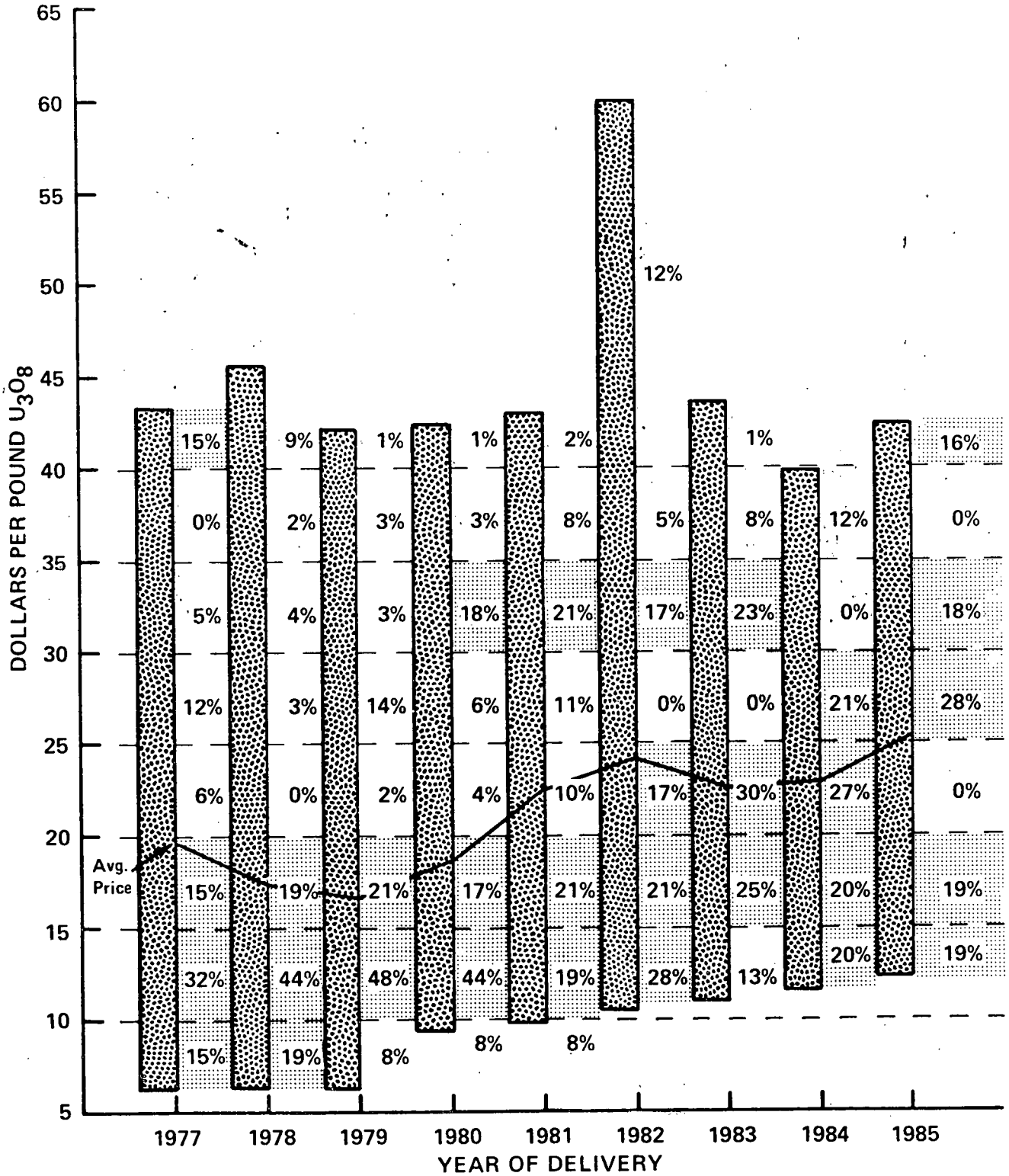

Figure 2

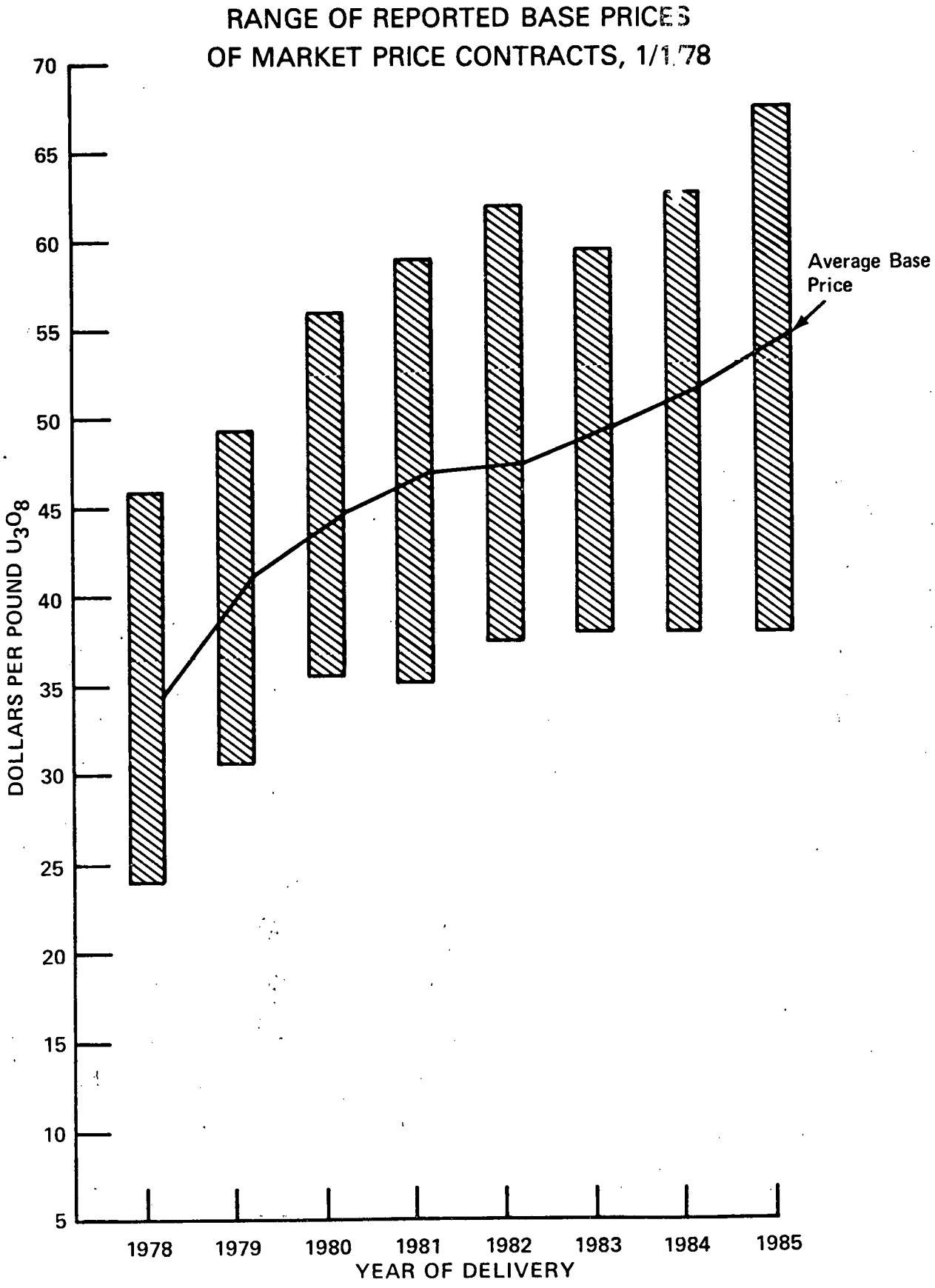
RANGE OF REPORTED BASE PRICES
OF MARKET PRICE CONTRACTS, 1/1/78
70
65
60
55
50
45
40
35
30
25
20
15
10
5
DOLLARS PER POUND U_3O_8
Average Base Price
1978
1979
1980
1981
1982
1983
1984
1985
YEAR OF DELIVERY

Figure 3

Procurement Arrangements

Table V presents the distribution, by year of delivery, of types of procurement--contract price, market price, and "other." Contract price and market price procurement have been described above. Settled market price contracts were included along with contract price commitments in the reporting of prices, but are included in the market price category in presenting the distribution of procurement.

The "Other" procurement category refers to arrangements that do not fall in the contract price or market price categories. This category primarily involves cases where utilities directly control uranium production operations (captive production). Over 80 percent of the arrangements listed in the "Other" category were described by survey respondents as captive production.

As shown in Table V, the percentage of contract price procurement steadily declines from a high percentage (84 percent) in 1978 to 37 percent in 1985, while the percentage of "other" procurement, which is low in 1978 (6 percent), steadily increases during this period to 38 percent. The percentage of market price procurement increases from 10 percent in 1978 to 32 percent in 1981, then declines to 25 percent in 1985. Since more delivery commitments have been made for those earlier years where the percentage of contract price procurement is high, contract price procurement represents the dominant form of contracting for the 1978-1985 period.

Contract price procurement was used almost exclusively until 1975. During 1975, market price contracting became the major procurement approach. In 1976 "other" procurement, primarily captive production, was the dominant form. During 1977 slightly over half of the uranium purchased was market price procurement, with the remainder contract price procurement. However, about half of the procurement identified as contract price involved near-term (1977 and 1978) deliveries.

Table VI presents a more detailed breakdown on the nature and use of base prices in market price contracts. In the table, market price contracts have been divided into three categories: (1) those with specific base prices, (2) those where the base price is related to production costs, and (3) those with no base value provision. Some 84 percent of the market price

TABLE V

TYPES OF PROCUREMENT
AS OF JANUARY 1, 1978

Year of Delivery	Percentage of Deliveries By Types of Procurement		
	Contract Price	Market Price	Other
1978	84	10	6
1979	79	13	8
1980	71	21	8
1981	50	32	18
1982	46	28	26
1983	41	30	29
1984	40	26	34
1985	37	25	38
1978-1985	58	23	19

TABLE VI

BASE PRICE ARRANGEMENTS IN
MARKET PRICE CONTRACTS
As of January 1, 1978

Year of Delivery	Percentage of Market Price Deliveries		
	Price Base	Cost Base	No Base Value
1978	68	29	3
1979	82	11	7
1980	61	31	8
1981	61	20	19
1982	53	19	28
1983	36	33	31
1984	39	57	4
1985	43	57	0
1978-1985	53	31	16

commitments for the 1978-1985 period do have some provision for a base value in the contract. About half of the amount without any base price provision are options.

Uranium Raw Material Activities by Utilities

During 1977, involvement by utilities with nuclear power projects in uranium raw material activities increased from 37 to 46 percent. Of 65 utilities responding to the survey, 30 indicated that they are directly involved in uranium raw material activities. Such raw materials activities by utilities would include exploration, ownership of reserves, involvement in mine development, and production. Providing "front-end" money as part of a procurement agreement would not constitute direct involvement.

Uranium Import Commitments

During 1977 domestic buyers contracted to purchase (including options) an additional 1,500 tons of foreign-origin U_3O_8 (see Table VII). As in the case of domestic-origin uranium, only the primary transactions for foreign-origin uranium are included. Thus, these data do not include resales of foreign-origin uranium by U. S. companies. The current data on 1975-1990 purchase commitments also reflect reductions to 1/1/77 data due to deletion of material which is now under litigation, and the resale of foreign-origin uranium purchased by U. S. buyers to foreign countries.

Uranium Export Commitments of Domestic-Origin Uranium

New sales commitments of domestic-origin uranium by domestic primary producers to foreign buyers (Table VIII) were 2,600 tons during 1977, equaling the 2,600-ton increase during 1976. These commitments pertain only to the export of domestic-origin uranium. The export commitments previously reported have been revised downward because of export of foreign-origin material, resulting in a net increase to export commitments of 2,000 tons U_3O_8. The export commitments to be delivered subsequent to January 1, 1978, totaled 4,000 tons.

U_3O_8 To Be Available For Sale

To ascertain the domestic uranium potentially available for sale, the survey requested from each producer "the amount of U_3O_8 supply over and above its current sales commitments" that the "company estimates it would be able to offer for sale by year of delivery for each year 1978 through 1985." The annual sums of responses are presented in Table IX.

TABLE VII

FOREIGN-ORIGIN URANIUM PURCHASE COMMITMENTS
FOR DOMESTIC END USE

Tons of U_3O_8

As of January 1, 1978

Year of Delivery	Annual	Cumulative
1975	700	700
1976	1,800	2,500
1977	2,800	5,300
1978	1,600	6,900
1979	1,600	8,500
1980	2,700	11,200
1981	3,600	14,800
1982	3,600	18,400
1983	3,300	21,700
1984	3,100	24,800
1985	2,900	27,700
1986-1990	1,750/yr	36,400

Notes: Reductions from January 1, 1977 totals include uranium that has been re-exported or is committed to be re-exported, plus material that is under litigation.

Includes 2,600 tons of optional purchases.

TABLE VIII

SALES COMMITMENTS OF DOMESTIC-ORIGIN
URANIUM TO FOREIGN BUYERS
Tons of U_3O_8
As of January 1, 1978

Year of Delivery	Annual	Cumulative
1966	400	400
1967	700	1,100
1968	800	1,900
1969	500	2,400
1970	2,100	4,500
1971	200	4,700
1972	100	4,800
1973	600	5,400
1974	1,500	6,900
1975	500	7,400
1976	600	8,000
1977	2,000	10,000
1978	1,500	11,500
1979	1,400	12,900
1980	1,000	13,900
1981	400	14,300
1982-1988	1,200	15,500

TABLE IX

U_3O_8 OVER AND ABOVE CURRENT SALES COMMITMENTS THAT PRODUCING COMPANIES ESTIMATE THEY WILL BE ABLE TO OFFER FOR SALE
As of 1/1/78

Year of Delivery	Tons U_3O_8
1978	3,100
1979	4,100
1980	5,000
1981	8,200
1982	10,500
1983	14,000
1984	16,300
1985	16,900
Total	78,100

Almost all of the producers participating in the survey provided data on this question. The quantity estimated to be available totals 78,100 tons U_3O_8 through 1985.

Inventories

Total uranium inventories (concentrate and UF_6) held by U. S. buyers (utilities, reactor manufacturers, and fabricators) declined slightly during 1977 (Figure 4) from 29,300 to 28,700 tons U_3O_8. Inventories of domestic-origin U_3O_8 decreased 700 tons from the January 1, 1977, level to 25,100 tons, while inventories of foreign-origin U_3O_8 increased 100 tons to 3,600 tons.

Of the 65 utilities responding to the survey, 49 reported holding inventories (21,500 tons of the total inventory), compared with 41 utilities holding 20,500 tons as of January 1, 1977[1/]. The 10 utilities with the largest inventories held 56 percent of the 21,500 tons, a decrease from the 70 percent owned by the ten largest holders as of January 1, 1977.[1/]

The decline in inventories is contrary to the expected increase projected last year. However, 1977 deliveries were less than expected, in part due to litigation. DOE domestic toll enrichment customers delivered 14,500 tons of domestic-origin U_3O_8 to the DOE enrichment plants in 1977 while receiving 13,900 tons from primary producers. The difference came from inventories.

The total of inventories held by domestic primary uranium producers as of January 1, 1978, is about 2,500 tons U_3O_8, an increase of 200 tons from the 2,300-ton inventory reported at the beginning of 1977. The inventories are for uranium in the form of concentrates or UF_6. Sixteen producers reported inventories. The largest five inventories constituted about 88 percent of the total producer inventory.

Unfilled Requirements

Table X lists the sum of unfilled uranium requirements for reactors in the survey reported by buyers as of January 1, 1978, and comparable data as of January 1, 1977. Unfilled requirements are that portion of utilities' total requirements remaining after consideration of their inventories and procurement arrangements.

1/ "Uranium Procurement and Prices," at Atomic Industrial Forum Fuel Cycle '78, New York, March 6, 1978, by John Patterson.

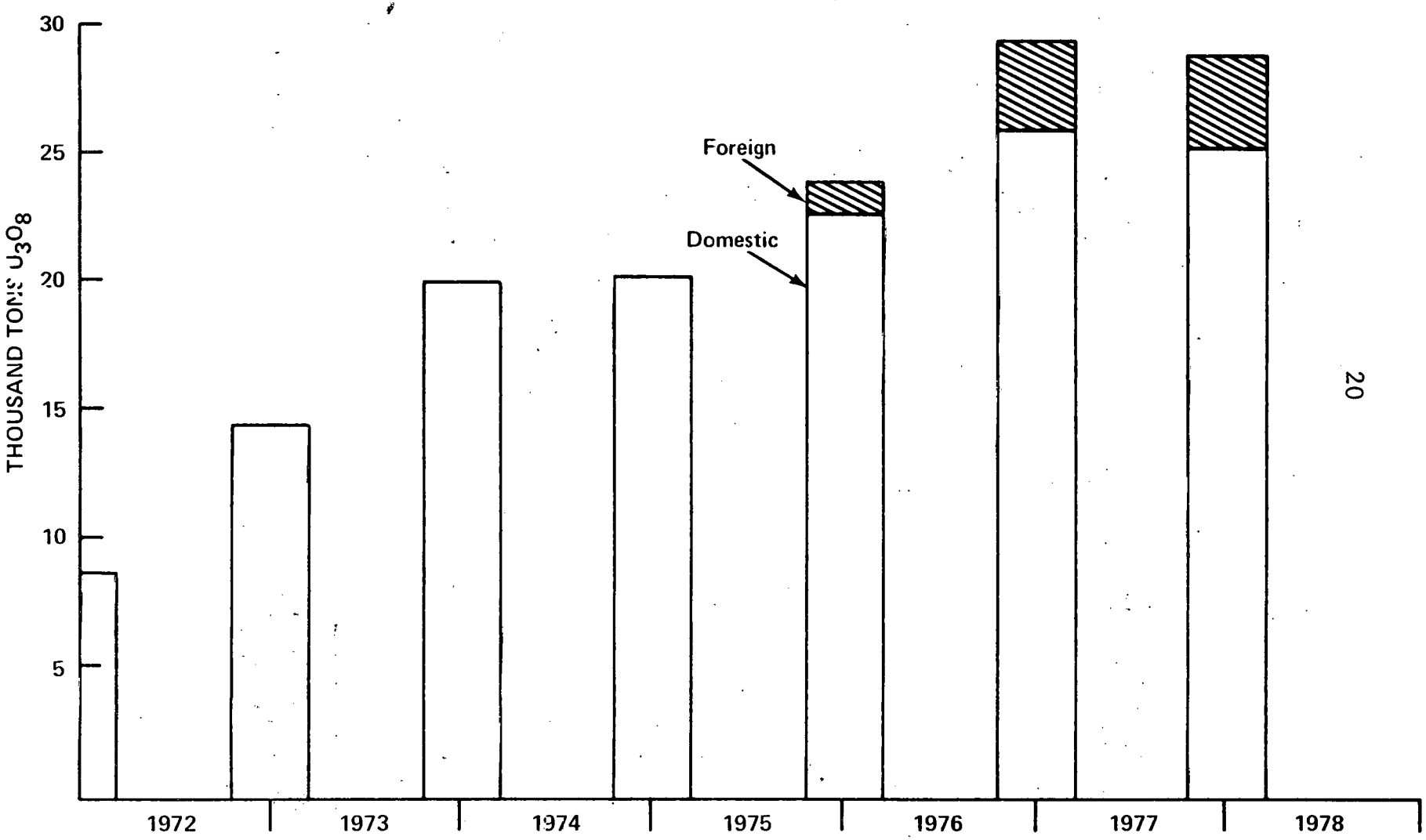
NATURAL URANIUM BUYER INVENTORIES
DOMESTIC & FOREIGN URANIUM
THOUSAND TONS U_3O_8
30
25
20
15
10
5
Foreign
Domestic
1972
1973
1974
1975
1976
1977
1978

Figure 4

TABLE X

UNFILLED URANIUM REQUIREMENTS[1/]
AS REPORTED 1/1/77 AND 1/1/78

Tons U_3O_8

	As of 1/1/78			As of 1/1/77	
	Annual	Cumulative		Annual	Cumulative
1978	300	300	1978	1,400	1,400
1979	1,600	1,900	1979	3,500	4,900
1980	3,000	3,900	1980	5,100	10,000
1981	5,700	9,600	1981	7,300	17,300
1982	8,600	18,200	1982	11,200	28,500
1983	8,000	26,200	1983	14,800	43,300
1984	12,400	38,600	1984	15,900	59,200
1985	14,100	52,700	1985	18,200	77,400
1986	19,500	72,200	1986	22,800	100,200
1987	23,300	95,500	1987	26,900	127,100
1988	24,700	120,200	1988	27,400	154,500
1989	28,100	148,300	1989	30,700	185,200
1990	28,600	176,900	1990	30,400	215,600

1/ Assuming tails assays of:
0.20% tails to 10/1/80
0.25% tails thereafter.
No recycle

Since all utilities did not respond to the current survey and some respondents did not provide data, the unfilled requirements are incomplete, and actual total unfilled requirements are likely to be higher than those reported for January 1, 1978, in Table X. The decrease in unfilled requirements from 1/1/77 to 1/1/78 resulted from the incomplete reporting, additional procurement, and revised utility estimates of uranium requirements.

Aggregate Supply and Demand

By combining the various data presented above, an aggregate picture of U. S. uranium supply can be developed. Table XI recaps data from the survey in Columns 1 through 5. The computed total of potential U. S. producer deliveries is shown in Column (6), which includes sales to (1) domestic and (2) foreign buyers, and (3) additional U_3O_8 to be available for sale.

Apparent availability of uranium to U. S. buyers is shown in Column (7) by summarizing domestic purchase commitments of (1) domestic and (4) foreign uranium, and (3) additional domestic U_3O_8 to be available for sale. This supply would be augmented by the 28,700 tons of buyer inventories. Apparent buyer uranium requirements, column (8), is obtained by summing purchase commitments--(1) domestic and (4) foreign--and (5) unfilled requirements.

Comparisons of the various data in Table XI indicate that there is sufficient uranium supply to take care of buyers perceived demands, at least through 1985. However, as pointed out previously, unfilled requirements are probably understated, and the supply computation in Column (7) assumes that all additional domestic U_3O_8 for sale would be made available to domestic buyers and not exported. Further supply expansion will depend on additional industry resource and production efforts which will, in turn, be influenced by future uranium demand developments.

Reactor Fuel Arrangements

In the 1960s, reactor manufacturers played a major role in supplying uranium for reactors, usually in relation to specific reactor cores and reloads. Over the past few years, utilities have been relying less and less on reactor manufacturers and more on direct purchase of uranium from primary producers or direct involvement in uranium production for their uranium supply. In view of this trend away from uranium procurement related to specific reactor cores and

TABLE XI

U.S. URANIUM SUPPLY AND MARKET SUMMARY

Years	Domestic Production (1) Sales Commitments To Domestic Buyers	Domestic Production (2) Sales Commitments To Foreign Buyers	Domestic Production (3) Estimated U_3O_8 To Be Available for Sale	(4) Procurement of Foreign Uranium	(5) Reported Unfilled Requirements	(6) Total Domestic Production 1+2+3	(7) Total* Domestic Supply 1+3+4	(8) Apparent Buyer Requirements 1+4+5
1978	19,100	1,500	3,100	1,600	300	23,700	23,800	21,000
1979	17,700	1,400	4,100	1,600	1,600	23,200	23,400	20,900
1980	19,600	1,000	5,000	2,700	3,000	25,600	27,300	25,300
1981	19,600	400	8,200	3,600	5,700	28,200	31,400	28,900
1982	19,500	200	10,500	3,600	8,600	30,200	33,600	31,700
1983	17,000	200	14,000	3,300	8,000	31,200	34,300	28,300
1984	13,000	200	16,300	3,100	12,400	29,500	32,400	28,500
1985	11,700	200	16,900	2,900	14,100	28,800	31,500	28,700
1986	9,100	200		1,750	19,500			30,350
1987	8,800	200		1,750	23,300			33,850
1988	7,900			1,750	24,700			34,350
1989	7,500			1,750	28,100			37,350
1990	6,400			1,750	28,600			36,750

*Buyers have an additional 28,700 tons U_3O_8 in inventory.

reloads, we have not included information in this report on fuel arrangements on a reactor basis.

Summary

Uranium marketing activity was much lower in 1977 than during 1976, which was the largest procurement year to date. Results from the survey suggest that there is an adequate supply of uranium--at least through 1985-- in light of apparent buyer concepts of demand. Unfilled requirements were reduced by additional procurement and slippages in requirements. U. S. buyers continue to concentrate almost exclusively on U. S. sources for procurement. Buyer and producer inventories changed only slightly during the year.

The average price reported for 1977 deliveries was $19.75 per pound of U_3O_8, compared to the $17.20 estimate reported as of July 1, 1977. An average of $17.40 was reported for 1978. Settlements of market prices in 1977 averaged $41.50 and for 1978 averaged $43.95. Most market price contracts have a base price. These prices are much higher than average contract prices and are closer to market price settlements. Producers estimate they will be able to offer for sale substantial additional quantities of uranium, indicating that they expect to expand production considerably.

ATTACHMENT A

COMPANIES PROVIDING DATA TO THE 1978 DOE MARKET SURVEY

Utilities

Alabama Power Company
Arizona Public Service Company
Arkansas Power & Light Company
Baltimore Gas and Electric Company
Boston Edison Company
Carolina Power & Light Company
Central Maine Power Company
Cincinnati Gas & Electric Company
Cleveland Electric Illuminating Company
Commonwealth Edison Company
Consolidated Edison Company of New York, Inc.
Consumers Power Company
Detroit Edison Company
Duke Power Company
Duquesne Light Company
Florida Power Corporation
Florida Power & Light Company
General Public Utility Corporation
Georgia Power Company
Gulf States Utilities Company
Houston Lighting & Power Company
Illinois Power Company
Iowa Power & Light Company
Kansas Gas & Electric Company
Long Island Lighting Company
Department of Water and Power of the City of Los Angeles
Louisiana Power & Light Company
Maine Yankee Atomic Power Company
Mississippi Power & Light Company
Nebraska Public Power District
New England Power Company
Niagara Mohawk Power Corporation
Northeast Utilities Service Company
Northern Indiana Public Service Company
Northern States Power Company
Ohio Edison Company
Omaha Public Power District
Pacific Gas and Electric Company
Pennsylvania Power & Light Company
Philadelphia Electric Company

ATTACHMENT A (continued)

Utilities (continued)

Portland General Electric Company
Potomac Electric Power Company
Power Authority of the State of New York
Public Service Company of Colorado
Public Service Electric and Gas Company
Public Service Company of Indiana
Public Service Company of New Hampshire
Public Service Company of Oklahoma
Puerto Rico Water Resources Authority
Puget Sound Power & Light Company
Rochester Gas and Electric Corporation
Sacramento Municipal Utility District
San Diego Gas and Electric Company
Southern California Edison Company
South Carolina Electric & Gas Company
Tennessee Valley Authority
Texas Utilities Services, Inc.
Toledo Edison Company
Union Electric Company
Vermont Yankee Nuclear Power Corporation
Virginia Electric and Power Company
Washington Public Power Supply System
Wisconsin Electric Power Company
Wisconsin Public Service Corporation
Yankee Atomic Electric Company

Reactor Manufacturers

Babcock & Wilcox Company
Combustion Engineering, Inc.
General Atomic Company
General Electric Company
Westinghouse Electric Corporation

Uranium Producing Companies

Anaconda Company
Atlas Corporation
Bokum Resources
Chevron Oil Company
Cleveland Cliffs Iron Company

ATTACHMENT A (continued)

Uranium Producing Companies (continued)

Cobb Nuclear Corporation
Continental Oil Company
Cotter Corporation
Dawn Mining Company
Exxon Nuclear Company, Inc.
Federal-American Partners
Freeport Minerals Company
Gardinier, Inc.
Getty Oil Company
Gulf Energy and Minerals Company
Homestake Mining Company
Inexco Oil Company
Intercontinental Energy Corporation
Kerr-McGee Corporation
Lucky Mc Uranium
Minerals Exploration Company
Mobil Oil Corporation
Nuclear Dynamics
Phillips Petroleum Company
Pioneer Nuclear, Inc.
Ranchers Exploration and Development Corporation
Reserve Oil and Minerals Corporation
Rio Algom Mines Limited
Rocky Mountain Energy Company
Sabine Production Company
Sohio Petroleum Company
Solution Engineering
U. S. Steel
Union Carbide Corporation
United Nuclear Corporation
Western Nuclear, Inc.

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