ANALYSIS AND FORECAST OF ELECTRICAL DISTRIBUTION SYSTEM MATERIALS

FINAL REPORT

VOLUME III

APPENDIX

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VOLUME III

APPENDIX *

ANALYSIS AND FORECAST OF ELECTRICAL DISTRIBUTION SYSTEM MATERIALS

ABSTRACT

These appendixes are referenced in Volume II of this report. They contain the detailed electrical distribution equipment requirements and input material requirements forecasts.

Forecasts are given for three electric energy usage scenarios. Also included are data on worldwide reserves and demand for 30 raw materials required for the manufacture of electrical distribution equipment.

*The appendixes are numbered to correspond to the chapter numbers of Volume II of this report. There are no appendixes for Chapters 1, 2, 7, and 8.

APPENDIX 3

FORECAST OF DISTRIBUTION SYSTEM EQUIPMENT REQUIREMENTS

I N D E X

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Table 3.1

VARIABLE DEFINITIONS

ALLCABLE - sum of OH and UG cable	CONCPOLE - concrete poles
ALLDISTX - sum of OH and UG trans- formers	CONN - connectors
ALLOHTX - all overhead transformers	CUMSHIP - cumulative shipments (peakload x CAPCNT)
ALLRES - all residential Tx (OH and UG)	DRY - dry type transformers
ALLRESOH - all overhead residential Tx	FUSE - fuses
ALLUGTX - all underground transformers	
ARREST - arresters	
BREAK - circuit breakers and reclosers	HPEROHTX - number of homes per overhead Tx
CAPAC - capacitors	HPERUGTX - number of homes per UG Tx
CAPCNT - ratio GVAR/GW for CUMSHIP	HSTART - averaged housing starts (single + mobile + .2 x multi)
CAPDIST - fraction of capacitors for distribution uses	
CAPDIV - number of years between current year and previous data year for capacitor calculation	INSTR - instrument transformers
CM1PCT-CM6PCT - fraction of KVA from commercial transformers to be applied to transformer types 1-6	INSUL - insulators
CM1PRU-CM6PRU - average KVA/unit for commercial transformer types 1-6	
COMM - all commercial Tx	KVARPRU - KVAR per unit for capacitor calculation
COMMKVA - total annual KVA for commercial transformers (types 1-6)	KWHSale - total annual KWH sales
COMM1 - type 1 commercial Tx - 1 ϕ pole 167-500 KVA	Δ KWHSale - net annual change in KWH sales
COMM2 - type 2 - 3 ϕ pole 15-500 KVA	METER - meters
COMM3 - type 3 - 3 ϕ UG 15-500 KVA	
COMM4 - type 4 - 3 ϕ UG 500-2500 KVA	NEWCUST - net new ultimate customers
COMM5 - type 5 - Network transformers	NEWPLANT - new plant and equipment expenditures (billions 58 \$)
COMM6 - type 6 - Power centers	NONRES - expenditures for private non-residential structures (billions 58 \$)
COMMSale - annual KWH sales for commercial and other uses (KWHSale-- residential-industrial)	

Table 3.1 (continued)

VARIABLE DEFINITIONS (cont.)

OHCOND - overhead conductor

OLDOH - load growth and upgrading of
existing residential overhead
transformers

PEAKLOAD - peak load in GW

PCTOH - fraction of new homes served
by overhead transformers

PCTUG - fraction of new homes served
by underground transformers

RESOH - residential overhead transformers
for new homes

RESUG - residential underground trans-
formers for new homes

SMALL - small power transformers

SUBSTA - substation transformers

SWGEAR - switchgear

UGCABLE - underground cable

WOODPOLE - wood poles

Table 3.1 (continued)

EQUIPMENT FORECAST MODELS

$ALLOHTX \leftarrow OLDOH + RESOH + COMM1 + COMM2$
 $ALLUGTX \leftarrow RESUG + COMM3$
 $SMALL \leftarrow COMM4 + COMM5 + COMM6 + SUBSTA$
 $DRY \leftarrow -12.1021 + 0.721741 \times NEWPLANT$
 $INSTR \leftarrow 65.3391 + 13.8811 \times NONRES$
VREG trended
 $METER \leftarrow 1380. + 1.024 \times HSTART$
 $SWGEAR \leftarrow 6.31645 + 0.547505 \times NEWPLANT$
 $FUSE \leftarrow 567.918 + 0.8475 \times ALLDISTX$
 $CAPAC \leftarrow (CUMSHIP_t - CUMSHIP_{t-1}) \times CAPDNT \div (CAPDIV \times KVARPRU)$
 $BREAK \leftarrow 0.406397 + 0.00136470 \times KWHSale + 17.4$
 $ARREST \leftarrow 707.7 + 0.565 \times ALLDISTX$
WOODPOLE trended
CONCPOLE constant
 $INSUL \leftarrow 3142.44 + 5.77797 \times ALLOHTX$
 $OHCOND \leftarrow 48.2727 + 0.126601 \times \Delta KWHSale + 0.0186780 \times NEWCUST$
 $UGCABLE \leftarrow 11.0654 + 0.121052 \times ALLUGTX$
 $CONN \leftarrow -300.661 + 4.98445 \times ALLDISTX$

Table 3.1 (continued)

INTERMEDIATE CALCULATIONS

OLDOH $\leftarrow 243.176 + 6.35529 \times \Delta KWHSale$

RESOH $\leftarrow HSTART \times PCTOH \div HPEROHTX$

RESUG $\leftarrow HSTART \times PCTUG \div HPERUGTX$

Note: $PCTUG = 1.0 - PCTOH$

COMMKVA $\leftarrow -5595.51 + 76.7517 \times COMMSale$

COMM1 $\leftarrow COMMKVA \times CM1PCT \div CM1PRU$

COMM2 $\leftarrow COMMKVA \times CM2PCT \div CM2PRU$

COMM3 $\leftarrow COMMKVA \times CM3PCT \div CM3PRU$

COMM4 $\leftarrow COMMKVA \times CM4PCT \div CM4PRU$

COMM5 $\leftarrow COMMKVA \times CM5PCT \div CM5PRU$

COMM6 $\leftarrow COMMKVA \times CM6PCT \div CM6PRU$

SUBSTA $\leftarrow 0.337481 + 0.0262240 \times \Delta KWHSale$

CUMSHIP $\leftarrow PEAKLOAD \times CAPCNT$

ALLRES $\leftarrow OLDOH + RESOH + RESUG$

ALLRESOH $\leftarrow OLDOH + RESOH$

ALLDISTX $\leftarrow ALLOHTX + ALLUGTX$

ALLCABLE $\leftarrow OHCOND + UGCABLE$

COMM $\leftarrow COMM1 + COMM2 + COMM3 + COMM4 + COMM5 + COMM6$

Table 3.2

HISTORICAL VALUES FOR EQUIPMENT REQUIREMENTS
(1000S OF UNITS UNLESS OTHERWISE NOTED)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
OVERHEAD TRANSFORMERS		675.0	708.0	710.0	793.0	860.0	977.0	1006.0	933.0	1072.0	1105.0	1020.0	1196.0	1380.0	1361.0
UNDERGROUND TRANSFORMERS		4.0	9.0	18.0	31.0	47.0	53.0	67.0	91.0	108.0	135.0	161.0	225.0	355.0	276.0
SMALL POWER TRANSFORMERS		5.2	5.6	5.0	6.6	8.3	9.5	10.1	10.8	11.0	10.7	10.5	11.1	12.4	15.8
DRY TYPE TRANSFORMERS	13.4	14.9	15.4	15.7	19.5	23.3	28.3	31.9	31.8	32.2	31.1	27.2	28.2	38.6	44.0
INSTRUMENT TRANSFORMERS	295.7	315.0	310.1	303.1	348.8	386.6	429.6	383.9	406.9	394.2	359.5	368.3	393.9	421.0	424.8
VOLTAGE REGULATORS															
METERS	3030.0	2811.0	2813.0	2891.0	2964.0	2905.0	2817.0	2621.0	2917.0	3073.0	3179.0	3605.0	4089.0	4326.0	3876.0
SWITCHGEAR	30.3	27.2	23.6	20.9	29.5	35.4	37.7	42.4	41.9	37.3	40.9	40.8	38.5	40.3	45.2
FUSES			1127.0	1101.0	1157.0	1290.0	1477.0	1401.0	1504.0	1651.0	1681.0	1405.0	1595.0	1651.0	1636.0
CAPACITORS	14.4	12.4	12.3	15.6	17.1	21.9	18.3	26.4	30.9	25.7	31.3	34.6	24.0	25.1	43.5
BREAKERS AND RECLOSERS	18.6	18.8	18.6	18.7	19.3	19.2	19.5	19.6	19.6	19.2	19.7	19.9	20.0	20.1	20.0
ARRESTERS									1226.0	1385.0	1480.0	1557.0	2023.0	1791.0	1725.0
WOOD POLES							2607.0	2627.0	2646.0	2664.0	2687.0	2704.0	2720.0	2736.0	2751.0
CONCRETE POLES															
INSULATORS		6597.0	6032.0	6100.0	6860.0	9710.0	11352.0	10726.0	8755.0	9288.0	9571.0	8816.0	9240.0	9590.0	11070.0
¹ OVERHEAD CONDUCTOR									85.0	87.0	88.0	95.0	94.0	109.0	78.0
¹ UNDERGROUND CABLE									36.0	24.0	27.0	25.0	22.0	67.0	40.0
CONNECTORS	3500.0	3396.0	3333.0	3375.0	3673.0	4140.0	4673.0	4442.0	4630.0	5211.0	5820.0	6097.0	7062.0	8629.0	7689.0
OVERHEAD + UNDERGROUND TX		679.0	717.0	728.0	824.0	907.0	1030.0	1073.0	1024.0	1180.0	1240.0	1181.0	1421.0	1735.0	1637.0
OVERHEAD TX--UPGRADING	525.0	490.0	508.0	499.0	583.0	638.0	777.0	789.0	717.0	864.0	914.0	787.0	945.0	1154.0	1181.0
NEW RESIDENTIAL OH TX	164.0	163.0	176.0	192.0	191.0	193.0	159.0	171.0	180.0	168.0	154.0	197.0	215.0	184.0	127.0
NEW RESIDENTIAL UG TX		3.0	7.6	14.0	22.0	37.0	42.4	53.6	74.3	93.4	117.3	140.7	200.3	319.8	229.4
TOTAL COMMERCIAL KVA		7600.0	8005.0	8005.0	10532.0	13894.0	17477.0	19540.0	18542.0	18933.0	20166.0	20823.0	23107.0	29024.0	37900.0
COMMERCIAL 1φ OH 167-500		16.1	13.8	11.9	12.7	19.9	28.5	31.5	21.5	25.4	25.3	23.4	23.4	26.3	35.2
COMMERCIAL 3φ OH 15-500		5.8	9.7	6.9	5.6	8.6	12.2	15.2	13.9	14.2	11.5	12.0	13.9	15.6	17.5
COMMERCIAL 3φ UG 15-500		0.4	1.9	4.8	9.6	10.3	10.3	13.6	17.2	14.8	17.5	20.9	24.9	35.1	46.2
COMMERCIAL 3φ UG 500-2500		0.4	0.7	0.9	1.2	1.5	2.0	2.3	3.1	2.7	3.3	3.9	4.7	6.0	8.5
COMMERCIAL NETWORK TX	2.2	2.0	1.6	1.6	1.7	1.8	2.2	2.1	1.9	2.3	1.8	1.7	1.9	2.0	2.0
COMMERCIAL POWER CENTERS		1.3	1.6	1.1	2.0	2.9	3.1	3.0	2.7	2.7	3.2	2.7	2.6	3.0	3.6
SUBSTATION TRANSFORMERS	1.9	1.5	1.7	1.4	1.7	2.1	2.2	2.7	3.0	3.3	2.4	2.1	1.9	1.8	1.7
¹ ALL CABLE (OH + UG)									121.0	111.0	115.0	120.0	116.0	176.0	118.0
RESIDENTIAL OVERHEAD TX	689.0	653.0	684.0	691.0	774.0	831.0	936.0	960.0	897.0	1032.0	1068.0	984.0	1160.0	1338.0	1308.0
RESIDENTIAL UNDERGROUND TX		3.0	7.6	14.0	22.0	37.0	42.4	53.6	74.3	93.4	117.3	140.7	200.3	319.8	229.4
ALL RESIDENTIAL TX		656.0	691.6	705.0	796.0	868.0	978.4	1013.6	971.3	1125.4	1185.3	1124.7	1360.3	1657.8	1537.4
COMMERCIAL TRANSFORMERS		26.0	29.3	27.2	32.8	45.0	58.3	67.7	60.3	62.1	62.6	64.6	71.4	88.0	113.0
² TOTAL KWH SALES	683.2	720.7	776.1	830.8	890.4	953.4	1039.0	1107.0	1202.3	1307.2	1391.4	1466.4	1577.7	1703.2	1700.8
^{2A} TOTAL KWH SALES	56.5	37.5	55.4	54.7	59.5	63.1	85.6	68.0	95.3	104.9	84.2	75.1	111.3	125.5	-2.4
² COMMCL AND OTHER KWH SALES	142.0	164.3	175.8	200.7	219.0	239.1	267.3	289.5	315.8	342.0	371.0	394.7	426.8	461.8	456.4
³ NEW PLANT AND EQUIPMENT	35.7	34.7	36.9	39.0	44.5	50.6	57.6	57.6	57.7	61.5	61.2	59.6	63.3	68.8	70.8
³ PRIVATE NONRES STRUCTURES	17.4	17.4	17.9	17.9	19.1	22.3	24.0	22.6	23.4	24.3	23.7	23.2	23.8	25.4	26.2
NET NEW ULTIMATE CUSTOMERS	1365.0	1260.0	1194.0	1533.0	1292.0	1409.0	1352.0	1257.0	1549.0	1213.0	1556.0	1780.0	1885.0	2311.0	1641.0
⁴ PEAK LOAD	133.0	142.0	153.0	162.0	175.0	186.0	203.0	214.0	238.0	258.0	275.0	292.0	319.0	344.0	350.0
SINGLE UNIT HOUSING STARTS	987.0	961.0	973.0	1021.0	972.0	965.0	780.0	845.0	900.0	811.0	815.0	1153.0	1312.0	1133.0	889.0
MULTI UNIT HOUSING STARTS	287.0	376.0	496.0	590.0	558.0	545.0	416.0	477.0	645.0	689.0	654.0	932.0	1066.0	925.0	464.0
MOBILE HOME SHIPMENTS	104.0	90.0	118.0	151.0	191.0	216.0	217.0	240.0	318.0	413.0	401.0	497.0	576.0	567.0	329.0

[NOTES: ¹THOUSANDS OF MILES OF INSTALLATION. ²BILLIONS OF KWH. ³BILLIONS OF 1958 DOLLARS. ⁴GW.]

Table 3.3 (1000 OF UNITS UNLESS OTHERWISE NOTED)
EQUIPMENT AND INDEPENDENT VARIABLES FORECASTS

OVERHEAD TRANSFORMERS*				UNDERGROUND TRANSFORMERS*			SMALL POWER TRANSFORMERS*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	537.3	537.3	537.3	84.5	84.5	84.5	13.8	13.8	13.8
1980	1036.6	1251.2	1561.1	238.9	307.7	341.4	18.6	21.8	23.7
1985	1417.1	1545.7	2171.7	247.4	368.1	481.2	23.6	28.0	33.2
1990	1226.6	1474.1	2286.6	200.8	401.1	613.4	26.6	32.9	41.7
1995	1443.6	1697.5	2553.0	166.3	428.7	702.8	31.3	39.2	52.3
2000	1121.0	1371.7	2195.6	169.0	459.3	808.5	33.5	43.0	60.5

DRY TYPE TRANSFORMERS*				INSTRUMENT TRANSFORMERS*			VOLTAGE REGULATORS		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	38.8	38.8	†	331.4	331.4	†	7.9	7.9	7.9
1980	48.7	54.3	†	415.1	447.1	†	7.2	8.3	9.5
1985	62.7	70.8	†	472.1	516.5	†	6.9	8.6	10.6
1990	73.9	84.7	†	531.7	585.9	†	6.6	9.0	11.8
1995	84.4	99.4	†	583.1	663.6	†	6.2	9.5	12.9
2000	94.6	113.8	†	637.2	740.0	†	6.0	9.8	14.0

METERS*				SWITCHGEAR*			FUSES*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	2836.0	2836.0	2836.0	42.7	42.7	†	992.9	992.9	992.9
1980	3241.0	3241.0	3393.6	52.5	55.8	†	1446.5	1628.4	1890.9
1985	3590.8	3621.2	3684.2	63.0	66.1	†	1768.9	1877.9	2408.4
1990	2995.9	3735.2	3743.0	71.5	73.6	†	1607.5	1817.2	2505.8
1995	2342.6	3735.2	3743.0	79.5	87.3	†	1791.4	2006.6	2731.6
2000	2133.7	3735.2	3743.0	87.3	98.5	†	1518.0	1730.4	2428.7

CAPACITORS*				BREAKERS AND RECLOSERS*			ARRESTERS*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	23.6	23.6	23.6	17.5	17.5	17.5	990.0	990.0	990.0
1980	11.0	23.9	35.3	20.8	21.0	21.3	1428.3	1588.5	1782.6
1985	30.0	41.9	68.1	21.8	22.2	23.3	1648.1	1789.0	2206.6
1990	25.3	45.3	84.7	22.7	23.4	25.4	1514.2	1767.2	2346.2
1995	44.0	58.4	100.7	23.9	24.8	27.8	1617.3	1909.0	2547.2
2000	30.9	42.7	83.7	24.7	25.8	29.8	1436.6	1742.2	2405.1

WOOD POLES			CONCRETE POLES			INSULATORS*			
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	†	2766.0	†	†	60.0	†	9100.0	9100.0	9100.0
1980	†	2833.0	†	†	60.0	†	9132.0	10372.1	12162.3
1985	†	2886.0	†	†	60.0	†	11330.5	12073.4	15690.3
1990	†	2917.0	†	†	60.0	†	10229.6	11659.6	16354.4
1995	†	2938.0	†	†	60.0	†	11483.7	12950.6	17893.5
2000	†	2943.0	†	†	60.0	†	9619.5	11068.0	15828.8

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

Table 3.3 (continued)

OH CONDUCTOR				UNDERGROUND CABLE			CONNECTORS		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	81.2	81.2	81.2	32.5	32.5	32.5	2563.5	2563.5	2563.5
1980	93.8	102.4	108.3	40.0	48.3	52.4	6056.9	7470.0	9182.0
1985	117.8	122.6	135.8	41.0	55.6	69.3	7996.0	9238.8	12922.7
1990	83.6	104.5	122.8	35.4	59.6	85.3	6814.2	9046.0	14154.3
1995	86.5	110.0	128.9	31.2	63.0	96.1	7724.0	10297.3	15927.6
2000	78.2	103.7	121.7	31.5	66.7	108.9	6129.3	8825.6	14673.5

OVERHEAD + UNDERGROUND TX*				OVERHEAD TX--UPGRADING*			NEW RESIDENTIAL OH TX*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	621.8	621.8	621.8	403.0	403.0	403.0	110.0	110.0	110.0
1980	1275.5	1559.0	1902.4	822.8	1009.6	1373.1	171.0	119.6	137.6
1985	1664.5	1913.8	2652.9	1207.9	1218.1	2034.1	167.5	124.4	82.5
1990	1427.4	1875.2	2900.0	1070.6	1246.0	2228.6	116.0	117.3	0.0
1995	1609.9	2126.2	3255.8	1340.1	1390.9	2492.9	66.3	106.5	0.0
2000	1290.0	1830.9	3004.2	1036.3	1532.0	2133.2	49.1	95.8	0.0

NEW RESIDENTIAL UG TX*				TOTAL COMMERCIAL KVA*			COMMERCIAL 1φ OH 167-500*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	65.2	65.2	65.2	22715.0	22715.0	22715.0	19.2	19.2	19.2
1980	184.3	227.2	277.4	39381.0	41299.7	46211.9	23.2	24.3	27.2
1985	174.6	273.6	385.1	47132.9	56957.1	62252.9	18.1	21.9	23.9
1990	109.6	287.5	480.7	54961.5	69621.1	79905.8	12.4	15.8	18.1
1995	55.7	287.5	524.5	62867.0	82285.1	101319.5	5.8	7.6	9.4
2000	36.8	287.5	576.9	71232.9	95025.9	124805.5	0.0	0.0	0.0

COMMERCIAL 3φ OH 15-500*				COMMERCIAL 3φ UG 15-500*			COMMERCIAL 3φ UG 500-2500*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	5.1	5.1	5.1	19.3	19.3	19.3	5.9	5.9	5.9
1980	19.7	20.6	23.1	54.5	57.2	64.0	9.8	10.3	11.6
1985	23.6	28.5	31.1	72.8	87.9	96.1	13.1	15.8	17.3
1990	27.5	34.8	40.0	91.2	115.6	132.6	16.5	20.9	24.0
1995	31.4	41.1	50.7	110.6	144.8	178.3	20.2	26.4	32.5
2000	35.6	47.5	62.4	132.2	176.4	231.6	23.7	31.7	41.6

COMMERCIAL NEWTORK TX*				COMMERCIAL POWER CENTERS			SUBSTATION TRANSFORMERS*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	2.0	2.0	2.0	3.5	3.5	3.5	2.4	2.4	2.4
1980	2.1	2.2	2.5	3.6	3.8	4.2	2.7	3.5	5.0
1985	1.9	2.3	2.6	3.5	4.3	4.7	4.3	4.4	7.7
1990	1.9	2.4	2.8	3.4	4.3	4.9	3.8	4.5	8.5
1995	1.9	2.5	3.0	3.1	4.1	5.1	4.9	5.1	9.6
2000	1.9	2.5	3.2	2.8	3.8	5.0	3.6	5.7	8.1

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

Table 3.3 (continued)

ALL CABLE				RESIDENTIAL OVERHEAD TX*			RESIDENTIAL UNDERGROUND TX*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	113.7	113.7	113.7	513.0	513.0	513.0	65.2	65.2	65.2
1980	133.8	150.7	160.7	993.8	1129.2	1510.8	184.4	227.2	277.4
1985	158.8	178.2	205.1	1375.4	1342.4	2116.6	174.6	273.6	385.1
1990	118.9	164.1	208.1	1186.7	1363.4	2228.6	109.6	287.5	480.7
1995	117.7	173.0	225.1	1406.4	1497.4	2492.9	55.7	287.5	524.5
2000	109.7	170.3	230.6	1085.4	1627.9	2133.2	36.8	287.5	576.9

ALL RESIDENTIAL TX*			COMMERCIAL TRANSFORMERS*			TOTAL KWH SALES ¹			
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	578.2	578.2	578.2	55.0	55.0	55.0	1689.0	1689.0	1689.0
1980	1178.1	1356.4	1788.2	112.9	118.4	132.5	2157.0	2292.0	2590.0
1985	1550.0	1616.0	2501.7	133.0	160.7	175.7	2916.0	3059.0	3999.0
1990	1296.2	1650.9	2709.3	153.0	193.8	222.4	3567.0	3848.0	5561.0
1995	1462.0	1784.9	3017.4	173.1	226.6	279.0	4430.0	4751.0	7331.0
2000	1122.2	1915.4	2710.1	196.3	261.8	343.9	5054.0	5765.0	8818.0

Δ TOTAL KWH SALES ¹			COMMCL AND OTHER KWH SALES ¹			NEW PLANT AND EQUIPMENT ²			
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	-37.0	-37.0	-37.0	518.0	518.0	518.0	65.4	65.4	↑
1980	91.2	120.6	177.8	586.0	611.0	675.0	84.3	90.4	↑
1985	151.8	153.4	281.8	687.0	815.0	884.0	103.6	109.2	↑
1990	130.2	157.8	312.4	789.0	980.0	1114.0	119.1	122.9	↑
1995	172.6	180.6	354.0	892.0	1145.0	1393.0	133.7	148.0	↑
2000	124.8	202.8	297.4	1001.0	1311.0	1699.0	147.9	168.4	↑

PRIVATE NONRES STRUCTURES ²			NET NEW ULTIMATE CUSTOMERS			PEAK LOAD ³			
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	23.9	23.9	↑	938.0	938.0	↑	343.0	343.0	343.0
1980	25.2	25.6	↑	1820.0	1984.0	↑	442.0	469.0	548.0
1985	29.3	32.5	↑	2692.0	2086.0	↑	563.0	627.0	823.0
1990	33.6	38.3	↑	1007.0	1654.0	↑	659.0	788.0	1145.0
1995	37.3	43.7	↑	876.0	1842.0	↑	818.0	973.0	1509.0
2000	41.2	49.4	↑	756.0	1832.0	↑	925.0	1180.0	1799.0

SINGLE UNIT HOUSING STARTS ⁴			MULTI UNIT HOUSING STARTS ⁴			MOBILE HOME SHIPMENTS ⁴			
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	962.0	962.0	↑	219.3	219.3	↑	216.5	216.5	↑
1980	1310.0	1252.6	↑	732.0	676.9	↑	510.0	429.4	↑
1985	1290.0	1535.8	↑	820.0	822.2	↑	705.0	488.4	↑
1990	1000.0	1614.0	↑	470.0	821.0	↑	484.0	521.8	↑
1995	500.0	1614.0	↑	200.0	821.0	↑	400.0	521.8	↑
2000	300.0	1614.0	↑	180.0	821.0	↑	400.0	521.8	↑

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

A3-8

NOTES:

- 1 Billions of KWH
- 2 Billions of 1958 dollars
- 3 Millions of units
- 4 GW

Table 3.4

EQUIPMENT AND INDEPENDENT VARIABLE FORECASTS INDEXED TO 1975 VALUES

OVERHEAD TRANSFORMERS*				UNDERGROUND TRANSFORMERS*			SMALL POWER TRANSFORMERS*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	1.9293	2.3288	2.9054	2.8267	3.6419	4.0398	1.3507	1.5828	1.7151
1985	2.6375	2.8768	4.0418	2.9278	4.3568	5.6953	1.7080	2.0264	2.4027
1990	2.2829	2.7435	4.2557	2.3766	4.7466	7.2591	1.9247	2.3831	3.0211
1995	2.6868	3.1593	4.7515	1.9681	5.0731	8.3169	2.2696	2.8430	3.7870
2000	2.0864	2.5529	4.0864	2.0001	5.4351	9.5685	2.4261	3.1159	4.3820

DRY TYPE TRANSFORMERS*				INSTRUMENT TRANSFORMERS*			VOLTAGE REGULATORS		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	1.0000	1.0000	†	1.0000	1.0000	†	1.0000	1.0000	1.0000
1980	1.2562	1.4002	†	1.2527	1.3490	†	0.9114	1.0506	1.2025
1985	1.6152	1.8254	†	1.4244	1.5585	†	0.8734	1.0886	1.3418
1990	1.9035	2.1826	†	1.6045	1.7679	†	0.8354	1.1392	1.4937
1995	2.1751	2.5620	†	1.7595	2.0025	†	0.7848	1.2025	1.6329
2000	2.4393	2.9341	†	1.9229	2.2328	†	0.7595	1.2405	1.7722

METERS*				SWITCHGEAR*			FUSES*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	1.0000	1.0000	1.0000	1.0000	1.0000	†	1.0000	1.0000	1.0000
1980	1.1428	1.1428	1.1966	1.2288	1.3065	†	1.4568	1.6400	1.9045
1985	1.2662	1.2769	1.2991	1.4763	1.5476	†	1.7816	1.8913	2.4256
1990	1.0564	1.3171	1.3198	1.6750	1.7243	†	1.6189	1.8302	2.5237
1995	0.8260	1.3171	1.3198	1.8622	2.0453	†	1.8042	2.0209	2.7511
2000	0.7523	1.3171	1.3198	2.0443	2.3072	†	1.5288	1.7428	2.4461

CAPACITORS*				BREAKERS AND RECLOSERS*			ARRESTERS*		
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	0.4661	1.0108	1.4973	1.1857	1.2011	1.2195	1.4428	1.6046	1.8006
1985	1.2697	1.7733	2.8856	1.2449	1.2701	1.3294	1.6648	1.8071	2.2289
1990	1.0705	1.9179	3.5906	1.2957	1.3354	1.4512	1.5295	1.7850	2.3699
1995	1.8638	2.4733	4.2668	1.3630	1.4151	1.5892	1.6337	1.9283	2.5729
2000	1.3078	1.8090	3.5447	1.4117	1.4757	1.7051	1.4511	1.7598	2.4294

WOOD POLES			CONCRETE POLES			INSULATORS*			
YEAR	LOW	BASE	HIGH	LOW	BASE	HIGH	LOW	BASE	HIGH
1975	†	1.0000	†	†	1.0000	†	1.0000	1.0000	1.0000
1980	†	1.0242	†	†	1.0000	†	1.0035	1.1398	1.3365
1985	†	1.0434	†	†	1.0000	†	1.2451	1.3267	1.7242
1990	†	1.0546	†	†	1.0000	†	1.1241	1.2813	1.7972
1995	†	1.0622	†	†	1.0000	†	1.2619	1.4231	1.9663
2000	†	1.0640	†	†	1.0000	†	1.0571	1.2163	1.7394

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

Table 3.4 (continued)

OH CONDUCTOR				UNDERGROUND CABLE			CONNECTORS		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	1.1547	1.2598	1.3333	1.2302	1.4868	1.6121	2.3627	2.9140	3.5818
1985	1.4496	1.5084	1.6717	1.2621	1.7119	2.1332	3.1192	3.6039	5.0410
1990	1.0286	1.2858	1.5118	1.0886	1.8346	2.6254	2.6581	3.5288	5.5214
1995	1.0645	1.3542	1.5870	0.9600	1.9373	2.9584	3.0131	4.0168	6.2132
2000	0.9624	1.2758	1.4974	0.9701	2.0513	3.3523	2.3910	3.4428	5.7240

OVERHEAD + UNDERGROUND TX*				OVERHEAD TX--UPGRADING*			NEW RESIDENTIAL OH TX*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	2.0513	2.5072	3.0596	2.0416	2.5053	3.4073	1.5545	1.0869	1.2513
1985	2.6769	3.0779	4.2665	2.9973	3.0225	5.0474	1.5228	1.1305	0.7501
1990	2.2956	3.0157	4.6639	2.6567	3.0919	5.5299	1.0548	1.0668	0.0000
1995	2.5892	3.4194	5.2360	3.3253	3.4515	6.1860	0.6026	0.9680	0.0000
2000	2.0746	2.9446	4.8314	2.5715	3.8016	5.2934	0.4461	0.8712	0.0000

NEW RESIDENTIAL UG TX*				TOTAL COMMERCIAL KVA*			COMMERCIAL 1φ OH 167-500*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	2.8275	3.4842	4.2546	1.7337	1.8182	2.0344	1.2065	1.2653	1.4158
1985	2.6783	4.1962	5.9069	2.0750	2.5075	2.7406	0.9442	1.1410	1.2471
1990	1.6807	4.4094	7.3735	2.4196	3.0650	3.5178	0.6481	0.8210	0.9423
1995	0.8536	4.4094	8.0438	2.7676	3.6225	4.4605	0.3032	0.3968	0.4886
2000	0.5644	4.4094	8.8482	3.1359	4.1834	5.4944	0.0000	0.0000	0.0000

COMMERCIAL 3φ OH 15-500*				COMMERCIAL 3φ UG 15-500*			COMMERCIAL 3φ UG 500-2500*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	3.8609	4.0490	4.5306	2.8240	2.9616	3.3138	1.6687	1.7500	1.9581
1985	4.6209	5.5840	6.1032	3.7706	4.5566	4.9802	2.2168	2.6789	2.9280
1990	5.3884	6.8256	7.8339	4.7273	5.9881	6.8727	2.7947	3.5401	4.0630
1995	6.1634	8.0672	9.9333	5.7329	7.5037	9.2395	3.4186	4.4745	5.5096
2000	6.9836	9.3163	12.2358	6.8502	9.1382	12.0020	4.0245	5.3687	7.0512

COMMERCIAL NETWORK TX*				COMMERCIAL POWER CENTERS			SUBSTATION TRANSFORMERS*		
<u>YEAR</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	1.0633	1.1151	1.2477	1.0229	1.0727	1.2003	1.1371	1.4583	2.0833
1985	0.9662	1.1676	1.2762	1.0100	1.2205	1.3340	1.7992	1.8167	3.2196
1990	0.9618	1.2184	1.3984	0.9664	1.2241	1.4049	1.5633	1.8650	3.5542
1995	0.9430	1.2343	1.5198	0.8981	1.1755	1.4474	2.0267	2.1142	4.0088
2000	0.9260	1.2353	1.6225	0.8141	1.0860	1.4263	1.5042	2.3567	3.3900

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

Table 3.4 (continued)

<u>YEAR</u>	<u>ALL CABLE</u>			<u>RESIDENTIAL OVERHEAD TX*</u>			<u>RESIDENTIAL UNDERGROUND TX*</u>		
	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	1.1763	1.3246	1.4130	1.9372	2.2011	2.9450	2.8275	3.4842	4.2546
1985	1.3960	1.5665	1.8036	2.6811	2.6168	4.1259	2.6783	4.1962	5.9069
1990	1.0457	1.4426	1.8300	2.3132	2.6577	4.3442	1.6807	4.4094	7.3735
1995	1.0346	1.5208	1.9788	2.7415	2.9189	4.8595	0.8536	4.4094	8.0438
2000	0.9646	1.4974	2.0274	2.1158	3.1732	4.1584	0.5644	4.4094	8.8482

<u>YEAR</u>	<u>ALL RESIDENTIAL TX*</u>			<u>COMMERCIAL TRANSFORMERS*</u>			<u>TOTAL KWH SALES</u>		
	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	2.0376	2.3458	3.0927	2.0529	2.1530	2.4090	1.2771	1.3570	1.5335
1985	2.6808	2.7949	4.3268	2.4184	2.9225	3.1943	1.7265	1.8111	2.3677
1990	2.2419	2.8552	4.6858	2.7810	3.5228	4.0432	2.1119	2.2783	3.2925
1995	2.5286	3.0870	5.2186	3.1473	4.1194	5.0723	2.6229	2.8129	4.3404
2000	1.9408	3.3126	4.6872	3.5686	4.7605	6.2524	2.9923	3.4133	5.2208

	<u>Δ TOTAL KWH SALES</u>			<u>COMMCL AND OTHER KWH SALES</u>			<u>NEW PLANT AND EQUIPMENT</u>		
	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
NORMALIZED VALUES ARE OMITTED BECAUSE 1975 HKVH SALES ARE NEGATIVE.	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	†
	1.1313	1.1795	1.3031	1.2900	1.3827	†	1.2900	1.3827	†
	1.3263	1.5734	1.7066	1.5853	1.6704	†	1.5853	1.6704	†
	1.5232	1.8919	2.1506	1.8225	1.8813	†	1.8225	1.8813	†
	1.7220	2.2104	2.6892	2.0459	2.2644	†	2.0459	2.2644	†
	1.9324	2.5309	3.2799	2.2632	2.5769	†	2.2632	2.5769	†

<u>YEAR</u>	<u>PRIVATE NONRES STRUCTURES</u>			<u>NET NEW ULTIMATE CUSTOMERS</u>			<u>PEAK LOAD</u>		
	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	1.0000	†	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1980	1.0526	1.0677	†	1.9403	2.1151	2.1429	1.2886	1.3673	1.5977
1985	1.2239	1.3588	†	2.8699	2.2239	2.9606	1.6414	1.8280	2.3994
1990	1.4035	1.5977	†	1.0736	1.7633	1.9979	1.9213	2.2974	3.3382
1995	1.5581	1.8266	†	0.9339	1.9638	2.0458	2.3848	2.8367	4.3994
2000	1.7210	2.0627	†	0.8060	1.9531	2.0394	2.6968	3.4402	5.2449

<u>YEAR</u>	<u>SINGLE UNIT HOUSING STARTS</u>			<u>MULTI UNIT HOUSING STARTS</u>			<u>MOBILE HOME SHIPMENTS</u>		
	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>	<u>LOW</u>	<u>BASE</u>	<u>HIGH</u>
1975	1.0000	.0000	†	1.0000	1.0000	†	1.0000	1.0000	†
1980	1.3618	.3021	†	3.3379	3.0867	†	2.3559	1.9834	†
1985	1.3410	1.5965	†	3.7392	3.7494	†	3.2567	2.2563	†
1990	1.0395	1.6778	†	2.1432	3.7439	†	2.2358	2.4102	†
1995	0.5198	1.6778	†	0.9120	3.7439	†	1.8477	2.4102	†
2000	0.3119	1.6778	†	0.8208	3.7439	†	1.8477	2.4102	†

* 1975 VALUES ARE ACTUAL.

† IDENTICAL TO BASE.

APPENDIX 4

FORECAST OF DISTRIBUTION SYSTEM MATERIAL REQUIREMENTS

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Table 4.1

TOTAL MATERIAL REQUIREMENTS FOR BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

YEAR:		1975	1980	1985	1990	1995	2000
LBS.	1 STEEL	385719307	599946069	722216793	744906795	842742353	856769747
	2 STNLS STEEL	2119974	3080472	3597519	3784787	4244178	4336910
	3 ELEC STEEL	191751987	410373075	503027628	527653209	598080873	581645803
	4 ALUMINUM	319083113	440993168	524599851	494144673	528691673	521292811
	5 COPPER	131587330	205666724	243396399	242858311	263736507	261563679
	6 BRASS	2656734	3738488	4330942	4490919	4902810	4897347
	7 BRONZE	391502	549621	651944	712204	828541	902393
	8 SILVER	87889	132460	153853	158078	179127	176053
	9 LEAD	5851392	8761615	10104220	10816956	11443429	12077067
	10 TIN	87478	102541	115526	119285	120498	119829
	11 ZINC,CD	329025	567349	683695	642780	698987	646930
	12 TUNGSTEN	29024	58349	69313	70985	79327	76052
	13 ALNICO,BAFE	418522	478285	534405	551217	551217	551217
	14 NI,NI-CR	1963	2552	3017	3354	3961	4455
	15 SI-CARBIDE	6313043	10129744	11408231	11268910	12173333	11109579
	16 BORIC ACID	81932	134369	154960	149952	165578	142791
	17 CU SALTS	336472	344623	351070	354841	357395	358004
	18 NAF	544293	557478	567907	574007	578140	579123
	19 ZN PHOSPHATE	122279	198983	239239	258919	291888	302443
	20 SAND	1031742	1692051	1951351	1888287	2085058	1798113
	21 CONCRETE	240000000	240000000	240000000	240000000	240000000	240000000
	22 PORCELAIN	56309307	91620543	107365728	109528948	123113350	118513715
	23 GLASS	9011799	12621663	14620626	15146463	16251357	16154434
	24 ALUMNA,BERYL	3111436	4541999	5332387	5909814	6755262	7339199
	25 GASKET MATLS	3071696	6340101	7610764	7771688	8694261	8232175
	26 PAPER,FIBER	23817600	46725474	57035816	59940270	67700767	66131303
	27 PHENOLIC RSN	949886	1173943	1333133	1391428	1432080	1443179
	28 POLYESTER	3569494	6069211	7273312	7669228	8832119	8994749
	29 EPOXY	1016444	1735716	2071981	2189680	2448276	2451709
	30 SILICONE	57052	105764	129037	130534	151686	141200
	31 POLYPRPYLENE	520828	526477	923608	998908	1288188	942168
	32 MSC PLASTICS	1322221	1954633	2359259	2586042	2946441	3090752
	33 POLYETHYLENE	267619915	347382949	412857113	368869608	388706045	376410080
	34 PVC	115333770	153483222	181307825	168090035	177211712	175108813
	35 ETPRP RUBBER	65081343	84413341	100342501	89546187	94360224	91314785
	36 CH,RSLE POLY	45300638	58346950	69477227	61339022	64627664	62160726
	37 BUTYL RUBBER	17760957	23013489	27330350	24672245	26149262	25553110
	38 NEOPRENE	6197823	7962938	9487791	8344225	8791153	8436855
	39 MISC INSUL	4896086	6167941	7385258	6295579	6630040	6246404
	40 PENTA	13458891	13784902	14042791	14193631	14295814	14320143
GAL.	41 PCB OR SUBST	1154271	1791184	2323175	2721689	3258459	3514959
	42 INSL OIL	20730341	53981053	65679380	68819431	76587468	75152973
	43 INSL VARNISH	169160	359819	436792	470471	529509	540148
	44 FINISHES	474855	807074	968285	1034929	1179640	1199673
	45 SOLVENTS	25237473	26229243	26887511	27227356	27569801	27621947
	46 CREOSOTE	14748193	15112737	15397272	15563619	15676480	15704145
UNIT	47 POLES	2543335	2604941	2653674	2682179	2701488	2706086
	48 CROSS ARMS	2503750	2564397	2612372	2640433	2659442	2663968
CUFT	49 ARGON	12237382	28498044	35204120	33573153	38662109	31241035

Table 4.1 (continued)

TOTAL MATERIAL REQUIREMENTS FOR LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

YEAR:	1975	1980	1985	1990	1995	2000
LBS. 1 STEEL	385719307	528972446	646034772	611202410	669676653	658979498
2 STNLS STEEL	2119974	2826693	3346408	3292273	3460628	3419190
3 ELEC STEEL	191751987	340339035	421235127	391029002	428820468	394686472
4 ALUMINUM	319083113	389435778	465984102	364121780	368953894	345561494
5 COPPER	131587330	177094971	206947436	175086799	177286744	166228970
6 BRASS	2656734	3476551	4075084	3798124	3777451	3603014
7 BRONZE	391502	507019	608183	651643	709825	752159
8 SILVER	87889	120287	144661	143876	159257	153132
9 LEAD	5851392	7259043	7495633	6475765	5754665	5783451
10 TIN	87478	101300	113246	94898	76317	69250
11 ZINC, CD	329025	490472	609547	478337	499649	431661
12 TUNGSTEN	29024	49900	59950	55127	59383	54242
13 ALNICO, BAFE	418522	478285	529914	442115	345703	314875
14 NI, NI-CR	1963	2405	2882	3242	3579	3918
15 SI-CARBIDE	6313043	9108287	10509929	9655679	10313319	9160634
16 BORIC ACID	81932	119359	145968	132644	147823	125260
17 CU SALTS	336472	344623	351070	354841	357395	358004
18 NAF	544293	557478	567907	574007	578140	579123
19 ZN PHOSPHATE	122279	174455	207593	202972	213999	212981
20 SAND	1031742	1503041	1838120	1670335	1861477	1577346
21 CONCRETE	240000000	240000000	240000000	240000000	240000000	240000000
22 PORCELAIN	56309307	80950826	97535100	93319849	102216924	95323703
23 GLASS	9011799	11786839	13706132	12318457	11671462	10926798
24 ALUMINA, BERYL	3111436	4132189	4828911	5237365	5753288	6110244
25 GASKET MATLS	3071696	5366238	6552199	5922256	6365270	5687755
26 PAPER, FIBER	23817600	38729606	47357854	43709871	47604200	43947511
27 PHENOLIC RSN	949886	1140295	1279077	1103628	935175	873531
28 POLYESTER	3569494	5340619	6535692	6545773	7218865	7122814
29 EPOXI	1016444	1521838	1824168	1737179	1833612	1756947
30 SILICONE	57052	91199	118739	113471	130369	117650
31 POLYPRYLENE	520828	242737	661297	557528	970726	681159
32 MSC PLASTICS	1322221	1748106	2113700	2192669	2414548	2464003
33 POLYETHYLENE	267619915	312426558	379480923	277968878	280169105	257910598
34 PVC	115333770	135899464	160424600	120791262	119004666	111276169
35 ETPRP RUBBER	65081343	75955977	92338209	67580825	68163151	62717986
36 CH, RSLF POLY	45300638	52733671	64611616	46932098	47634449	43641830
37 BUTYL RUBBER	17760957	20795555	25271671	19040243	19416633	18160902
38 NEOPRENE	6197823	7208182	8856227	6415794	6526246	5970207
39 MISC INSUL	4896086	5653474	7097321	5035896	5211925	4712162
40 PENTA	13458891	13784902	14042791	14193631	14295814	14320143
GAL. 41 PCB OR SUBST	1154271	1503733	1944150	2168248	2594414	2730473
42 INSL OIL	20730341	43540424	51677153	45353206	47047386	42730099
43 INSL VARNISH	169160	298528	353411	335331	357553	347888
44 FINISHES	474855	690915	828365	814923	889562	869105
45 SOLVENTS	25237473	26107852	26748315	26991969	27252013	27261684
46 CREFOSOTE	14748193	15110463	15393285	15557006	15667817	15694561
UNIT 47 POLES	2543335	2604941	2653674	2682179	2701488	2706086
48 CROSS ARMS	2503750	2564397	2612372	2640433	2659442	2663968
CUFT 49 ARGON	12237382	23609833	32275712	27936418	32879792	25531533

Table 4.1 (continued)

TOTAL MATERIAL REQUIREMENTS FOR HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

YEAR:	1975	1980	1985	1990	1995	2000
LBS. 1 STEEL	385719307	654162001	849229301	935150101	1070881152	1117909903
2 STNLS STEEL	2119974	3317224	4071413	4447366	5001458	5158449
3 ELEC STEEL	191751987	474630683	652293843	750833860	862535565	882198196
4 ALUMINUM	319083113	474782517	611468992	632730207	693060271	710858430
5 COPPER	131587330	226588904	296630179	328001803	365326663	379745186
6 BRASS	2656734	4045089	4882799	5231484	5727956	5767438
7 BRONZE	391502	569479	694236	774204	901543	984928
8 SILVER	87889	145375	180652	193947	217955	214996
9 LEAD	5851392	9518061	12597444	15458621	17421943	19672837
10 TIN	87478	108249	120104	123583	125477	125320
11 ZINC,CD	329025	640781	848896	882730	968833	937049
12 TUNGSTEN	29024	66587	88438	99467	112326	112691
13 ALNICO,BAFE	418522	500809	543696	552370	552370	552370
14 NI,NI-CR	1963	2556	3019	3354	3961	4456
15 SI-CARBIDE	6313043	11367177	14071072	14961301	16243066	15336627
16 BORIC ACID	81932	156037	198738	206776	225405	200414
17 CU SALTS	336472	344623	351070	354841	357395	358004
18 NAF	544293	557478	567907	574007	578140	579123
19 ZN PHOSPHATE	122279	218411	283741	327896	378497	406742
20 SAND	1031742	1964908	2502627	2603849	2838435	2523734
21 CONCRETE	240000000	240000000	240000000	240000000	240000000	240000000
22 PORCELAIN	56309307	102652089	131334798	143098722	160429128	157722961
23 GLASS	9011799	13685010	16454175	17629623	19069564	19208042
24 ALUMNA,BERYL	3111436	4697229	5691574	6444495	7379309	8039111
25 GASKET MATLS	3071696	7317448	9819420	11003981	12404121	12309734
26 PAPER,FIBER	23817600	53899178	73970440	85718703	98739136	102017261
27 PHENOLIC RSN	949886	1243331	1416409	1498993	1569936	1611826
28 POLY ESTER	3569494	6668752	8617590	9609340	11031207	11373965
29 EPOXY	1016444	1927846	2489696	2800478	3163853	3254955
30 SILICONE	57052	123184	164618	177365	201828	190730
31 POLY PRPY LENE	520828	779829	1502919	1870058	2222279	1846157
32 MSC PLASTICS	1322221	2099912	2681375	3061445	3530904	3772055
33 POLY ETHY LENE	267619915	369396696	468199846	454820010	486565223	484407731
34 PVC	115333770	163829693	209447010	214521627	232487779	239595965
35 ETPRP RUBBER	65081343	89751918	113726950	110285817	117931744	117268163
36 CH,RSLE POLY	45300638	61969593	78327860	74755243	79611883	78277017
37 BUTYL RUBBER	17760957	24362598	30667485	29785049	31908676	31819923
38 NEOPRENE	6197823	8454059	10676175	10130463	10772425	10547589
39 MISC INSUL	4896086	6528014	8184831	7401831	7769858	7331323
40 PENTA	13458891	13784902	14042791	14193631	14295814	14320143
GAL. 41 PCB OR SUBST	1154271	1966127	2803531	3522746	4401167	5005637
42 INSL OIL	20730341	62473079	87167416	103037691	118106061	124036770
43 INSL VARNISH	169160	404715	551442	654532	757672	813567
44 FINISHES	474855	905929	1192458	1371841	1588213	1676381
45 SOLVENTS	25237473	26335334	27128189	27585876	27995354	28106530
46 CREOSOTE	14748193	15113847	15401007	15570629	15685530	15715677
UNIT 47 POLES	2543335	2604941	2653674	2682179	2701488	2706086
48 CROSS ARMS	2503750	2564397	2612372	2640433	2659442	2663968
CUFT 49 ARGON	12237382	35554752	49461342	52079203	58146102	50007252

Table 4.2

TOTAL NORMALIZED MATERIAL REQUIREMENTS FOR BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

YEAR:	1975	1980	1985	1990	1995	2000
LBS. 1 STEEL	1.0000	1.5554	1.8724	1.9312	2.1849	2.2212
2 STNLS STEEL	1.0000	1.4531	1.6970	1.7853	2.0020	2.0457
3 ELEC STEEL	1.0000	2.1401	2.6233	2.7517	3.1190	3.0333
4 ALUMINUM	1.0000	1.3821	1.6441	1.5486	1.6569	1.6337
5 COPPER	1.0000	1.5630	1.8497	1.8456	2.0043	1.9878
6 BRASS	1.0000	1.4072	1.6302	1.6904	1.8454	1.8434
7 BRONZE	1.0000	1.4039	1.6652	1.8192	2.1163	2.3050
8 SILVER	1.0000	1.5071	1.7505	1.7986	2.0381	2.0031
9 LEAD	1.0000	1.4974	1.7268	1.8486	1.9557	2.0640
10 TIN	1.0000	1.1722	1.3206	1.3636	1.3775	1.3698
11 ZINC,CD	1.0000	1.7243	2.0779	1.9536	2.1244	1.9662
12 TUNGSTEN	1.0000	2.0104	2.3882	2.4458	2.7332	2.6203
13 ALNICO,BAFE	1.0000	1.1428	1.2769	1.3171	1.3171	1.3171
14 NI,NI-CR	1.0000	1.3004	1.5375	1.7091	2.0182	2.2703
15 SI-CARBIDE	1.0000	1.6046	1.8071	1.7850	1.9283	1.7598
16 BORIC ACID	1.0000	1.6400	1.8913	1.8302	2.0209	1.7428
17 CU SALTS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
18 NAF	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
19 ZN PHOSPHATE	1.0000	1.6273	1.9565	2.1174	2.3871	2.4734
20 SAND	1.0000	1.6400	1.8913	1.8302	2.0209	1.7428
21 CONCRETE	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
22 PORCELAIN	1.0000	1.6271	1.9067	1.9451	2.1864	2.1047
23 GLASS	1.0000	1.4006	1.6224	1.6807	1.8033	1.7926
24 ALUMINA,BE KYL	1.0000	1.4598	1.7138	1.8994	2.1711	2.3588
25 GASKET MATLS	1.0000	2.0640	2.4777	2.5301	2.8304	2.6800
26 PAPER,FIBER	1.0000	1.9618	2.3947	2.5166	2.8425	2.7766
27 PHENOLIC KSN	1.0000	1.2359	1.4035	1.4648	1.5076	1.5193
28 POLYESTER	1.0000	1.7003	2.0376	2.1485	2.4743	2.5199
29 EPOXY	1.0000	1.7076	2.0385	2.1543	2.4087	2.4120
30 SILICONE	1.0000	1.8538	2.2618	2.2880	2.6587	2.4750
31 POLYPRPYLENE	1.0000	1.0108	1.7733	1.9179	2.4733	1.8090
32 MSC PLASTICS	1.0000	1.4783	1.7843	1.9558	2.2284	2.3375
33 POLYETHYLENE	1.0000	1.2980	1.5427	1.3783	1.4525	1.4065
34 PVC	1.0000	1.3308	1.5720	1.4574	1.5365	1.5183
35 ETPRP RUBBER	1.0000	1.2970	1.5418	1.3759	1.4499	1.4031
36 CH,MSLF POLY	1.0000	1.2880	1.5337	1.3540	1.4266	1.3722
37 BUTYL RUBBER	1.0000	1.2957	1.5388	1.3891	1.4723	1.4387
38 NEOPRENE	1.0000	1.2848	1.5308	1.3463	1.4184	1.3613
39 MISC INSUL	1.0000	1.2598	1.5084	1.2858	1.3542	1.2758
40 PENTA	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
GAL. 41 PCB OR SUBST	1.0000	1.5518	2.0127	2.3579	2.8230	3.0452
42 INSL OIL	1.0000	2.6040	3.1683	3.3197	3.6945	3.6253
43 INSL VARNISH	1.0000	2.1271	2.5821	2.7812	3.1302	3.1931
44 FINISHES	1.0000	1.6996	2.0391	2.1795	2.4842	2.5264
45 SOLVENTS	1.0000	1.0393	1.0654	1.0788	1.0924	1.0945
46 CREOSOTE	1.0000	1.0247	1.0440	1.0553	1.0629	1.0648
UNIT 47 POLES	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
48 CROSS ARMS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
CUFT 49 ARGON	1.0000	2.3288	2.8768	2.7435	3.1593	2.5529

Table 4.2. (continued)

TOTAL NORMALIZED MATERIAL REQUIREMENTS FOR LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

	YEAR:	1975	1980	1985	1990	1995	2000
LBS.	1 STEEL	1.0000	1.3714	1.6749	1.5846	1.7362	1.7084
	2 STNLS STEEL	1.0000	1.3334	1.5785	1.5530	1.6324	1.6128
	3 ELEC STEEL	1.0000	1.7749	2.1968	2.0392	2.2363	2.0583
	4 ALUMINUM	1.0000	1.2205	1.4604	1.1412	1.1563	1.0830
	5 COPPER	1.0000	1.3458	1.5727	1.3306	1.3473	1.2633
	6 BRASS	1.0000	1.3086	1.5339	1.4296	1.4218	1.3562
	7 BRONZE	1.0000	1.2951	1.5535	1.6645	1.8131	1.9212
	8 SILVER	1.0000	1.3686	1.6460	1.6370	1.8120	1.7423
	9 LEAD	1.0000	1.2406	1.2810	1.1067	0.9835	0.9884
	10 TIN	1.0000	1.1580	1.2946	1.0848	0.8724	0.7916
	11 ZINC,CD	1.0000	1.4907	1.8526	1.4538	1.5186	1.3119
	12 TUNGSTEN	1.0000	1.7193	2.0656	1.8994	2.0460	1.8689
	13 ALNICO,BAFE	1.0000	1.1428	1.2662	1.0564	0.8260	0.7523
	14 NI,NI-CK	1.0000	1.2256	1.4685	1.6520	1.8236	1.9961
	15 SI-CARBIDE	1.0000	1.4428	1.6648	1.5295	1.6337	1.4511
	16 BORIC ACID	1.0000	1.4568	1.7816	1.6189	1.8042	1.5288
	17 CU SALTS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	18 NAF	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	19 ZN PHOSPHATE	1.0000	1.4267	1.6977	1.6599	1.7501	1.7418
	20 SAND	1.0000	1.4568	1.7816	1.6189	1.8042	1.5288
	21 CONCRETE	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	22 PORCELAIN	1.0000	1.4376	1.7321	1.6573	1.8153	1.6929
	23 GLASS	1.0000	1.3079	1.5209	1.3669	1.2951	1.2125
	24 ALUMNA,BERYL	1.0000	1.3281	1.5520	1.6833	1.8491	1.9638
	25 GASKET MATLS	1.0000	1.7470	2.1331	1.9280	2.0722	1.8517
	26 PAPER,FIBER	1.0000	1.6261	1.9884	1.8352	1.9987	1.8452
	27 PHENOLIC RSN	1.0000	1.2005	1.3466	1.1619	0.9845	0.9196
	28 POLYESTER	1.0000	1.4962	1.8310	1.8338	2.0224	1.9955
	29 EPOXY	1.0000	1.4972	1.7947	1.7091	1.8039	1.7285
	30 SILICONE	1.0000	1.5985	2.0813	1.9889	2.2851	2.0622
	31 POLYPRPYLENE	1.0000	0.4661	1.2697	1.0705	1.8638	1.3078
	32 MSC PLASTICS	1.0000	1.3221	1.5986	1.6583	1.8261	1.8635
	33 POLYETHYLENE	1.0000	1.1674	1.4180	1.0387	1.0469	0.9637
	34 PVC	1.0000	1.1783	1.3910	1.0473	1.0318	0.9648
	35 ETPRP RUBBER	1.0000	1.1671	1.4188	1.0384	1.0474	0.9637
	36 CH,KSLE POLY	1.0000	1.1641	1.4263	1.0360	1.0515	0.9634
	37 BUTYL RUBBER	1.0000	1.1709	1.4229	1.0720	1.0932	1.0225
	38 NEOPRENE	1.0000	1.1630	1.4289	1.0352	1.0530	0.9633
	39 MISC INSUL	1.0000	1.1547	1.4496	1.0286	1.0645	0.9624
	40 PENTA	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
GAL.	41 PCB OR SUBST	1.0000	1.3028	1.6843	1.8785	2.2477	2.3655
	42 INSL OIL	1.0000	2.1003	2.4928	2.1878	2.2695	2.0612
	43 INSL VARNISH	1.0000	1.7648	2.0892	1.9823	2.1137	2.0566
	44 FINISHES	1.0000	1.4550	1.7445	1.7162	1.8733	1.8303
	45 SOLVENTS	1.0000	1.0345	1.0599	1.0695	1.0798	1.0802
	46 CREOSOTE	1.0000	1.0246	1.0437	1.0548	1.0624	1.0642
UNIT	47 POLES	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	48 CROSS ARMS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
CUFT	49 ARGON	1.0000	1.9293	2.6375	2.2829	2.6868	2.0864

Table 4.2 (continued)

TOTAL NORMALIZED MATERIAL REQUIREMENTS FOR HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

YEAR:		1975	1980	1985	1990	1995	2000
LBS.	1 STEEL	1.0000	1.6960	2.2017	2.4244	2.7763	2.8982
	2 STNLS STEEL	1.0000	1.5647	1.9205	2.0978	2.3592	2.4333
	3 ELBC STEEL	1.0000	2.4752	3.4018	3.9157	4.4982	4.6007
	4 ALUMINUM	1.0000	1.4880	1.9163	1.9830	2.1720	2.2278
	5 COPPER	1.0000	1.7220	2.2542	2.4927	2.7763	2.8859
	6 BRASS	1.0000	1.5226	1.8379	1.9691	2.1560	2.1709
	7 BRONZE	1.0000	1.4546	1.7733	1.9775	2.3028	2.5158
	8 SILVER	1.0000	1.6541	2.0555	2.2067	2.4799	2.4462
	9 LEAD	1.0000	1.6266	2.1529	2.6419	2.9774	3.3621
	10 TIN	1.0000	1.2374	1.3730	1.4127	1.4344	1.4326
	11 ZINC, CU	1.0000	1.9475	2.5800	2.6829	2.9446	2.8480
	12 TUNGSTEN	1.0000	2.2942	3.0471	3.4271	3.8702	3.8828
	13 ALNICO, BAFB	1.0000	1.1966	1.2991	1.3198	1.3198	1.3198
	14 NI, NI-CR	1.0000	1.3024	1.5383	1.7092	2.0183	2.2704
	15 SI-CARBIDE	1.0000	1.8006	2.2289	2.3699	2.5729	2.4294
	16 BORIC ACID	1.0000	1.9045	2.4256	2.5237	2.7511	2.4461
	17 CU SALTS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	18 NAF	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	19 ZN PHOSPHATE	1.0000	1.7862	2.3204	2.6815	3.0953	3.3263
	20 SAND	1.0000	1.9045	2.4256	2.5237	2.7511	2.4461
	21 CONCRETE	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	22 PORCELAIN	1.0000	1.8230	2.3324	2.5413	2.8491	2.8010
	23 GLASS	1.0000	1.5186	1.8258	1.9563	2.1161	2.1314
	24 ALUMINA, BERYL	1.0000	1.5097	1.8292	2.0712	2.3717	2.5837
	25 GASKET MATLS	1.0000	2.3822	3.1967	3.5824	4.0382	4.0075
	26 PAPER, FIBER	1.0000	2.2630	3.1057	3.5990	4.1456	4.2833
	27 PHENOLIC RSN	1.0000	1.3089	1.4911	1.5781	1.6528	1.6969
	28 POLYESTER	1.0000	1.8683	2.4142	2.6921	3.0904	3.1864
	29 EPOXY	1.0000	1.8967	2.4494	2.7552	3.1127	3.2023
	30 SILICONE	1.0000	2.1592	2.8854	3.1089	3.5376	3.3431
	31 POLYPRPYLENE	1.0000	1.4973	2.8856	3.5906	4.2668	3.5447
	32 MSC PLASTICS	1.0000	1.5882	2.0279	2.3154	2.6704	2.8528
	33 POLYETHYLENE	1.0000	1.3803	1.7495	1.6995	1.8181	1.8101
	34 PVC	1.0000	1.4205	1.8160	1.8600	2.0158	2.0774
	35 ETPRP RUBBER	1.0000	1.3791	1.7475	1.6946	1.8121	1.8019
	36 CH, KSLF POLY	1.0000	1.3680	1.7291	1.6502	1.7574	1.7279
	37 BUTYL RUBBER	1.0000	1.3717	1.7267	1.6770	1.7966	1.7916
	38 NEOPRENE	1.0000	1.3640	1.7226	1.6345	1.7381	1.7018
	39 MISC INSUL	1.0000	1.3333	1.6717	1.5118	1.5870	1.4974
	40 PENTA	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
GAL.	41 PCB OR SUBST	1.0000	1.7033	2.4288	3.0519	3.8129	4.3366
	42 INSL OIL	1.0000	3.0136	4.2048	4.9704	5.6973	5.9833
	43 INSL VARNISH	1.0000	2.3925	3.2599	3.8693	4.4790	4.8094
	44 FINISHES	1.0000	1.9078	2.5112	2.8890	3.3446	3.5303
	45 SOLVENTS	1.0000	1.0435	1.0749	1.0931	1.1093	1.1137
	46 CREOSOTE	1.0000	1.0248	1.0443	1.0558	1.0636	1.0656
UNIT	47 POLES	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
	48 CROSS-ARMS	1.0000	1.0242	1.0434	1.0546	1.0622	1.0640
CUFT	49 ARGON	1.0000	2.9054	4.0418	4.2557	4.7515	4.0864

PROJECTION YEAR 1975 (1)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
PROJECTION (1000S):		537.300	84.500	13.800	38.800	331.400
LBS.	1 STEEL	48258706	18537264	58789747	16331273	3039394
	2 STNLS STEEL	153954	59481	55899		
	3 ELEC STEEL	78279766	30071698	39941392	16736909	11374322
	4 ALUMINUM	8810915	3384906	10612025	2449691	2028343
	5 COPPER	9213564	3538208	342380	2042291	
	6 BRASS	166586	63774	13975		
	7 BRONZE	22106	8585	8734		
	8 SILVER	2447	920	262		
	9 LEAD	48831	18825	32491		
	10 TIN	1066	429	699		
	11 ZINC,CD	78951	30047	275		
	12 TUNGSTEN	11053	4292			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAP					
	19 ZN PHOSPHATE	15395	9627	27949	5644	390
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	6355543	2299528	324038	617273	117020
	23 GLASS	817141	306604	69873	89945	
	24 ALUMNA,BERYL	197377	78491	46291	9700	1997137
	25 GASKET MATLS	1184263	429245	100443	88182	29645
	26 PAPER,FIBER	7539806	2759434	5895570	828909	11702
	27 PHENOLIC RSN	19738	15943	49785	2469	3901
	28 POLYESTER	678977	245283	30570	74955	
	29 EPOXY	228957	78491	87342	26455	235600
	30 SILICONE	29212	429	1922	882	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	27633	12264	231456	317455	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					1092185
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			1091772		
	42 INSL OIL	8566167	7419811	3668354		145885
	43 INSL VARNISH	40265	36792	43671	2381	37446
	44 FINISHES	96715	38019	91709	15873	1170
	45 SOLVENTS	123558	47524	65506	16931	1170
	46 CREOSOTE		2790			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	12237382				

PROJECTION YEAR 1975 (1)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
PROJECTION (1000S):		7.900	2836.000	42.700	992.900	23.600
LBS.						
1	STEEL	9814231	1382879	86760354	3305216	411454
2	STNLS STEEL	30992	504861	865336	311950	
3	ELEC STEEL	10589038	4758861			
4	ALUMINUM	1515179	2834537	2340942		218053
5	COPPER	1549615	2819903	10948960	3395038	7639
6	BRASS	9470	1218982	714186	372641	3125
7	BRONZE	3745	36584	311748		
8	SILVER			34387	41391	
9	LEAD	6629	58535			556
10	TIN		84729			556
11	ZINC,CD	2583	22828			
12	TUNGSTEN			5196		
13	ALNICO,BAFE		418522			
14	NI,NI-CK		73	1889		
15	SI-CARBIDE					
16	BORIC ACID				81932	
17	CU SALTS					
18	NAF					
19	ZN PHOSPHATE	9298	28682	23617		69
20	SAND				1031742	
21	CONCRETE					
22	PORCELAIN	143483		15776327	7844274	24305
23	GLASS	36732	5597368	1511504	582631	
24	ALUMNA,BERYL	26688		755752		
25	GASKET MATLS	40032	219505	387323		
26	PAPER,FIBER	2031718	831923	37788	212417	347218
27	PHENOLIC RSN		826801			
28	POLYESTER	23029	2707	2125553	388421	
29	EPOXY	30992	234138	94469		
30	SILICONE	990		23617		
31	POLYPRPYLENE					520828
32	MSC PLASTICS	51654	120728	170044	30345	7812
33	POLYETHYLENE					
34	PVC					
35	ETPRP RUBBER					
36	CH,KSLE POLY					
37	BUTYL RUBBER					
38	NEOPRENE					
39	MISC INSUL					
40	PENTA					
GAL.						
41	PCB OR SUBST					62499
42	INSL OIL	729231				
43	INSL VARNISH	8092	512			
44	FINISHES	98142	9805	113363		417
45	SOLVENTS	24966	58535	151150		382
46	CREOSOTE					
UNIT						
47	POLES					
48	CROSS ARMS					
CUFT						
49	ARGON					

PROJECTION YEAR 1975 (1)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		17.500	990.000	2766.000	60.000	9100.000
LBS.	1 STEEL	11107143	2881043		24000000	3123758
	2 STNLS STEEL	137500				
	3 ELEC STEEL					
	4 ALUMINUM	1080357	114783			1808491
	5 COPPER	2103571	1148			
	6 BRASS	12500	31496			
	7 BRONZE					
	8 SILVER	8482				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	8482				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		6313043			
	16 BORIC ACID					
	17 CU SALTS			336472		
	18 NAF			544293		
	19 ZN PHOSPHATE	1607				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	982143	15495652			6329720
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	133929	459130			
	26 PAPER,FIBER	241071				
	27 PHENOLIC RSN	31250				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	8482	344348			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,KSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			13458891		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	200893				
	43 INSL VARNISH					
	44 FINISHES	9643				
	45 SOLVENTS	7143		24740608		
	46 CREOSOTE			14745403		
UNIT	47 POLES			2543335		
	48 CROSS ARMS			2503750		
CUFT	49 ARGON					

PROJECTION YEAR 1975 (1)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND.	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		81.245	32.497	2563.516	
LBS.	1	STEEL	97976846		385719307
	2	STNLS STEEL			2119974
	3	ELEC STEEL			191751987
	4	ALUMINUM	204951246	76266843	319083113
	5	COPPER	41250513	666801	131587330
	6	BRASS		5501107	2656734
	7	BRONZE			391502
	8	SILVER			87889
	9	LEAD	5585525		5851392
	10	TIN			87478
	11	ZINC,CD	194341		329025
	12	TUNGSTEN			29024
	13	ALNICO,BAFE			418522
	14	NI,NI-CR			1963
	15	SI-CARBIDE			6313043
	16	BORIC ACID			81932
	17	CU SALTS			336472
	18	NAF			544293
	19	ZN PHOSPHATE			122279
	20	SAND			1031742
	21	CONCRETE			240000000
	22	PORCELAIN			56309307
	23	GLASS			9011799
	24	ALUMNA,BERYL			3111436
	25	GASKET MATLS			3071696
	26	PAPER,FIBER	410857	2669188	23817600
	27	PHENOLIC RSN			949886
	28	POLYESTER			3569494
	29	EPOXY			1016444
	30	SILICONE			57052
	31	POLYPRPYLENE			520828
	32	MSC PLASTICS			1322221
	33	POLYETHYLENE	222509497	45110418	267619915
	34	PVC	79269852	36063917	115333770
	35	ETPRP RUBBER	54398408	10682935	65081343
	36	CH,RSLF POLY	39670020	5630618	45300638
	37	BUTYL RUBBER	14285046	2383726	17760957
	38	NEOPRENE	5514752	683071	6197823
	39	MISC INSUL	4896086		4896086
	40	PENTA			13458891
GAL.	41	PCB OR SUBST			1154271
	42	INSL OIL			20730341
	43	INSL VARNISH			169160
	44	FINISHES			474855
	45	SOLVENTS			25237473
	46	CREOSOTE			14748193
UNIT	47	POLES			2543335
	48	CROSS ARMS			2503750
CUFT	49	ARGON			12237382

PROJECTION YEAR 1980 (2)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
PROJECTION (1000S):		1251.248	307.739	21.842	54.327	447.068
LBS.	1 STEEL	112383416	67510522	93049685	22866728	4100228
	2 STNLS STEEL	358524	216623	88474		
	3 BLEC STEEL	182295554	109517566	63217384	23434692	15344283
	4 ALUMINUM	20518592	12327426	16796222	3430009	2736292
	5 COPPER	21456269	12885733	541903	2859576	
	6 BRASS	387941	232256	22118		
	7 BRONZE	51480	31265	13824		
	8 SILVER	5700	3350	415		
	9 LEAD	113716	68560	51425		
	10 TIN	2482	1563	1106		
	11 ZINC,CD	183858	109428	435		
	12 TUNGSTEN	25740	15633			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	35852	35062	44237	7902	526
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	14800597	8374610	512872	864293	157863
	23 GLASS	1902934	1116615	110592	125940	
	24 ALUMNA,BERYL	459646	285853	73267	13582	2694195
	25 GASKET MATLS	2757875	1563261	158977	123470	39992
	26 PAPER,FIBER	17558472	10049532	9331234	1160622	15786
	27 PHENOLIC RSN	45965	58064	78797	3457	5262
	28 POLYESTER	1581182	893292	48384	104950	
	29 EPOXY	533189	285853	138241	37041	317831
	30 SILICONE	68028	1563	3041	1235	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	64350	44665	366337	444494	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					1473388
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			1728006		
	42 INSL OIL	19948631	27022075	5806101		196803
	43 INSL VARNISH	93768	133994	69120	3334	50516
	44 FINISHES	225226	138460	145153	22225	1579
	45 SOLVENTS	287738	173075	103680	23706	1579
	46 CREOSOTE		10161			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	28498044				

PROJECTION YEAR 1980 (2)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		8.300	3240.968	55.789	1628.350	23.856
LBS.	1 STEEL	10311154	1580348	113355349	5420534	415917
	2 STNLS STEEL	32562	576953	1130591	511597	
	3 ELEC STEEL	11125192	5438405			
	4 ALUMINUM	1591897	3239296	3058521		220418
	5 COPPER	1628077	3222572	14305188	5567842	7722
	6 BRASS	9949	1393048	933108	611129	3159
	7 BRONZE	3935	41808	407309		
	8 SILVER			44927	67881	
	9 LEAD	6965	66893			562
	10 TIN		96828			562
	11 ZINC,CD	2713	26088			
	12 TUNGSTEN			6788		
	13 ALNICO,BAFE		478285			
	14 NI,NI-CR		84	2469		
	15 SI-CARBIDE					
	16 BORIC ACID				134369	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	9768	32778	30857		70
	20 SAND				1692051	
	21 CONCRETE					
	22 PORCELAIN	150748		20612308	12864562	24569
	23 GLASS	38591	6396647	1974832	955511	
	24 ALUMNA,BERYL	28039		987416		
	25 GASKET MATLS	42059	250849	506051		
	26 PAPER,FIBER	2134590	950717	49371	348363	350985
	27 PHENOLIC RSN		944864			
	28 POLYESTER	24195	3094	2777107	637007	
	29 EPOXY	32562	267572	123427		
	30 SILICONE	1040		30857		
	31 POLYPRPYLENE					526477
	32 MSC PLASTICS	54269	137967	222169	49766	7897
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					63177
	42 INSL OIL	766154				
	43 INSL VARNISH	8502	585			
	44 FINISHES	103112	11205	148112		421
	45 SOLVENTS	26230	66893	197483		386
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1980 (2)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		21.019	1588.528	2833.000	60.000	10372.111
LBS.	1 STEEL	13340631	4622847		24000000	3560436
	2 STNLS STEEL	165149				
	3 ELEC STEEL					
	4 ALUMINUM	1297602	184177			2061305
	5 COPPER	2526570	1842			
	6 BRASS	15014	130766			
	7 BRONZE					
	8 SILVER	10188				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10188				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		10129744			
	16 BOKIC ACID					
	17 CU SALTS			344623		
	18 NAF			557478		
	19 ZN PHOSPHATE	1930				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1179638	24863917			7214567
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	160860	736709			
	26 PAPER,FIBER	289547				
	27 PHENOLIC RSN	37534				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10188	552531			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			13784902		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	241290				
	43 INSL VARNISH					
	44 FINISHES	11582				
	45 SOLVENTS	8579		25339893		
	46 CREOSOTE			15102576		
UNIT	47 POLES			2604941		
	48 CROSS ARMS			2564397		
CUFT	49 ARGON					

PROJECTION YEAR 1980 (2)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):	OH COND	UG CABLE	CONNECTORS	TOTAL
	102.350	48.318	7470.037	
LBS. 1 STEEL	64962250			541480044
2 STNLS STEEL				3080472
3 ELEC STEEL				410373075
4 ALUMINUM	135890209	35657614	1943045	240952624
5 COPPER	27350606	66061051	16030122	174445074
6 BRASS				3738488
7 BRONZE				549621
8 SILVER				132460
9 LEAD		7684995		7993116
10 TIN				102541
11 ZINC,CD	128855			451379
12 TUNGSTEN				58349
13 ALNICO,BAFE				478285
14 NI,NI-CR				2552
15 SI-CARBIDE				10129744
16 BORIC ACID				134369
17 CU SALTS				344623
18 NAF				557478
19 ZN PHOSPHATE				198983
20 SAND				1692051
21 CONCRETE				240000000
22 PORCELAIN				91620543
23 GLASS				12621663
24 ALUMNA,BERYL				4541999
25 GASKET MATLS				6340101
26 PAPER,FIBER	272413	3607880		46119514
27 PHENOLIC RSN				1173943
28 POLYESTER				6069211
29 EPOXY				1735716
30 SILICONE				105764
31 POLYPRPYLENE				526477
32 MSC PLASTICS				1954633
33 POLYETHYLENE	147531975	60974724		208506699
34 PVC	52558826	48746776		101305601
35 ETPRP RUBBER	36068144	14439880		50508024
36 CH,KSLF POLY	26302681	7610777		33913459
37 BUTYL RUBBER	9471511	3222028		14166927
38 NEOPRENE	3656483	923291		4579774
39 MISC INSUL	3246285			3246285
40 PENTA				13784902
GAL. 41 PCB OR SUBST				1791184
42 INSL OIL				53981053
43 INSL VARNISH				359819
44 FINISHES				807074
45 SOLVENTS				26229243
46 CREOSOTE				15112737
UNIT 47 POLES				2604941
48 CROSS ARMS				2564397
CUFT 49 ARGON				28498044

PROJECTION YEAR 1985 (3)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
PROJECTION (1000S):		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
		1545.688	368.150	27.964	70.826	516.473
LBS.	1 STEEL	138829151	80763240	119130180	29811307	4736767
	2 STNLS STEEL	442891	259148	113272		
	3 ELEC STEEL	225192808	131016517	80936311	30551761	17726404
	4 ALUMINUM	25346967	14747373	21503962	4471696	3161087
	5 COPPER	26505296	15415279	693790	3728023	
	6 BRASS	479230	277849	28318		
	7 BRONZE	63595	37403	17699		
	8 SILVER	7041	4007	531		
	9 LEAD	140476	82019	65839		
	10 TIN	3066	1870	1416		
	11 ZINC,CD	227123	130910	558		
	12 TUNGSTEN	31797	18701			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	44289	41945	56636	10302	608
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	18283430	10018596	656623	1126777	182370
	23 GLASS	2350727	1335813	141590	164188	
	24 ALUMNA,BERYL	567808	341968	93803	17707	3112455
	25 GASKET MATLS	3406850	1870138	203535	160968	46201
	26 PAPER,FIBER	21690281	12022315	11946646	1513101	18237
	27 PHENOLIC RSN	56781	69462	100883	4507	6079
	28 POLYESTER	1953261	1068650	61946	136823	
	29 EPOXY	658658	341968	176987	48290	367172
	30 SILICONE	84036	1870	3894	1610	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	79493	53433	469016	579485	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					1702124
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			2212342		
	42 INSL OIL	24642884	32326669	7433468		227355
	43 INSL VARNISH	115833	160298	88494	4346	58359
	44 FINISHES	278226	165641	185837	28974	1824
	45 SOLVENTS	355448	207051	132741	30906	1824
	46 CREOSOTE		12156			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	35204120				

PROJECTION YEAR 1985 (3)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):			VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
			8.600	3621.247	66.082	1877.888	41.851
LBS.	1	STEEL	10683846	1765778	134269267	6251209	729651
	2	STNLS STEEL	33738	644649	1339184	589997	
	3	ELEC. STEEL	11527308	6076520			
	4	ALUMINUM	1649436	3619378	3622814		386684
	5	COPPER	1686923	3600693	16944477	6421091	13546
	6	BRASS	10309	1556501	1105265	704782	5542
	7	BRONZE	4077	46714	482457		
	8	SILVER			53216	78284	
	9	LEAD	7216	74742			985
	10	TIN		108189			985
	11	ZINC,CD	2812	29149			
	12	TUNGSTEN			8041		
	13	ALNICO,BAFE		534405			
	14	NI,NI-CR		93	2924		
	15	SI-CARBIDE					
	16	BORIC ACID				154960	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	10122	36624	36550		123
	20	SAND				1951351	
	21	CONCRETE					
	22	PORCELAIN	156197		24415252	14836004	43102
	23	GLASS	39986	7147198	2339186	1101939	
	24	ALUMNA,BERYL	29053		1169593		
	25	GASKET MATLS	43579	280282	599416		
	26	PAPER,FIBER	2211744	1062270	58480	401749	615739
	27	PHENOLIC RSN		1055730			
	28	POLYESTER	25070	3457	3289480	734626	
	29	EPOXY	33738	298968	146199		
	30	SILICONE	1078		36550		
	31	POLYPRPYLENE					923608
	32	MSC PLASTICS	56231	154155	263158	57393	13854
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,RSLF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					110833
	42	INSL OIL	793846				
	43	INSL VARNISH	8809	654			
	44	FINISHES	106838	12519	175439		739
	45	SOLVENTS	27178	74742	233919		677
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 1985 (3)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		22.227	1789.018	2886.000	60.000	12073.376
LBS.	1 STEEL	14107341	5206302		24000000	4144429
	2 STNLS STEEL	174641				
	3 ELEC STEEL					
	4 ALUMINUM	1372177	207422			2399406
	5 COPPER	2671776	2074			
	6 BRASS	15876	147270			
	7 BRONZE					
	8 SILVER	10773				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10773				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		11408231			
	16 BORIC ACID					
	17 CU SALTS			351070		
	18 NAF			567907		
	19 ZN PHOSPHATE	2041				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1247434	28002021			8397922
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	170105	829690			
	26 PAPER,FIBER	306188				
	27 PHENOLIC RSN	39691				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10773	622267			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14042791		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	255157				
	43 INSL VARNISH					
	44 FINISHES	12248				
	45 SOLVENTS	9072		25813953		
	46 CREOSOTE			15385116		
UNIT	47 POLES			2653674		
	48 CROSS ARMS			2612372		
CUFT	49 ARGON					

PROJECTION YEAR 1985 (3)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		OH COND	UG CABLE	CONNECTORS	TOTAL
		122.550	55.631	9238.775	
LBS.	1 STEEL	77783329			652211798
	2 STNLS STEEL				3597519
	3 ELEC STEEL				503027628
	4 ALUMINUM	162709771	41054446	2403115	288655735
	5 COPPER	32748576	76059488	19825697	206316732
	6 BRASS				4330942
	7 BRONZE				651944
	8 SILVER				153853
	9 LEAD		8848130		9219407
	10 TIN				115526
	11 ZINC,CD	154286			544838
	12 TUNGSTEN				69313
	13 ALNICO,BAFE				534405
	14 NI,NI-CR				3017
	15 SI-CARBIDE				11408231
	16 BORIC ACID				154960
	17 CU SALTS				351070
	18 NAF				567907
	19 ZN PHOSPHATE				239239
	20 SAND				1951351
	21 CONCRETE				240000000
	22 PORCELAIN				107365728
	23 GLASS				14620626
	24 ALUMNA,BERYL				5332387
	25 GASKET MATLS				7610764
	26 PAPER,FIBER	326177	4153938		56326863
	27 PHENOLIC RSN				1333133
	28 POLYESTER				7273312
	29 EPOXY				2071981
	30 SILICONE				129037
	31 POLYPRPYLENE				923608
	32 MSC PLASTICS				2359259
	33 POLYETHYLENE	176649179	70203338		246852517
	34 PVC	62931940	56124671		119056612
	35 ETPRP RUBBER	43186625	16625377		59812001
	36 CH,RSLE POLY	31493831	8762680		40256511
	37 BUTYL RUBBER	11340827	3709687		16752638
	38 NEOPRENE	4378134	1063033		5441167
	39 MISC INSUL	3886978			3886978
	40 PENTA				14042791
GAL.	41 PCB OR SUBST				2323175
	42 INSL OIL				65679380
	43 INSL VARNISH				436792
	44 FINISHES				968285
	45 SOLVENTS				26887511
	46 CREOSOTE				15397272
UNIT	47 POLES				2653674
	48 CROSS ARMS				2612372
CUFT	49 ARGON				35204120

PROJECTION YEAR 1990 (4)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

			TRANSFORMERS			
PROJECTION (1000S):			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE INSTRUMENT
			1474.078	401.091	32.887	84.683 585.879
LBS.	1	STEEL	132397352	87989702	140102783	35643845 5373316
	2	STNLS STEEL	422372	282335	133213	
	3	ELEC STEEL	214759876	142739497	95184969	36529167 20108559
	4	ALUMINUM	24172670	16066925	25289687	5346577 3585888
	5	COPPER	25277335	16794594	815931	4457405
	6	BRASS	457028	302710	33303	
	7	BRONZE	60648	40749	20815	
	8	SILVER	6715	4366	624	
	9	LEAD	133968	89358	77430	
	10	TIN	2924	2037	1665	
	11	ZINC,CD	216601	142623	656	
	12	TUNGSTEN	30324	20375		
	13	ALNICO,BAFE				
	14	NI,NI-CK				
	15	SI-CARBIDE				
	16	BORIC ACID				
	17	CU SALTS				
	18	NAF				
	19	ZN PHOSPHATE	42237	45698	66607	12318 690
	20	SAND				
	21	CONCRETE				
	22	PORCELAIN	17436379	10915031	772220	1347230 206878
	23	GLASS	2241820	1455337	166516	196311
	24	ALUMNA,BEKYL	541502	372566	110317	21171 3530721
	25	GASKET MATLS	3249015	2037472	239367	192461 52409
	26	PAPER,FIBER	20685394	13098037	14049826	1809137 20688
	27	PHENOLIC RSN	54150	75678	118643	5389 6896
	28	POLYESTER	1862768	1164270	72851	163592
	29	EPOXY	628143	372566	208146	57738 416515
	30	SILICONE	80142	2037	4579	1925
	31	POLYPRPYLENE				
	32	MSC PLASTICS	75810	58213	551586	692861
	33	POLYETHYLENE				
	34	PVC				
	35	ETPRP RUBBER				
	36	CH,RSLE POLY				
	37	BUTYL RUBBER				1930863
	38	NEOPRENE				
	39	MISC INSUL				
	40	PENTA				
GAL.	41	PCB OR SUBST			2601820	
	42	INSL OIL	23501207	35219166	8742114	257908
	43	INSL VARNISH	110467	174640	104073	5196 66201
	44	FINISHES	265336	180462	218553	34643 2069
	45	SOLVENTS	338981	225577	156109	36953 2069
	46	CREOSOTE		13244		
UNIT	47	POLES				
	48	CROSS ARMS				
CUFT	49	ARGON	33573153			

PROJECTION YEAR 1990 (4)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS	
PROJECTION (1000S):		9.000	3735.167	73.627	1817.199	45.263	
LBS.	1	STEEL	11180769	1821328	149599639	6049184	789137
	2	STNLS STEEL	35308	664929	1492087	570929	
	3	ELEC STEEL	12063462	6267680			
	4	ALUMINUM	1726154	3733240	4036454		418209
	5	COPPER	1765385	3713966	18879136	6213577	14651
	6	BRASS	10788	1605467	1231460	682005	5993
	7	BRONZE	4266	48183	537542		
	8	SILVER			59293	75754	
	9	LEAD	7552	77093			1066
	10	TIN		111592			1066
	11	ZINC,CD	2942	30066			
	12	TUNGSTEN			8959		
	13	ALNICO,BAFE		551217			
	14	NI,NI-CR		96	3258		
	15	SI-CARBIDE					
	16	BORIC ACID				149952	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	10592	37776	40723		133
	20	SAND				1888287	
	21	CONCRETE					
	22	PORCELAIN	163462		27202896	14356539	46616
	23	GLASS	41846	7372040	2606265	1066327	
	24	ALUMNA,BERYL	30404		1303133		
	25	GASKET MATLS	45606	289100	667856		
	26	PAPER,FIBER	2314615	1095688	65157	388765	665938
	27	PHENOLIC RSN		1088942			
	28	POLYESTER	26236	3566	3665061	710885	
	29	EPOXY	35308	308373	162892		
	30	SILICONE	1128		40723		
	31	POLYPRPYLENE					998908
	32	MSC PLASTICS	58846	159005	293205	55538	14984
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,KSLEF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					119869
	42	INSL OIL	830769				
	43	INSL VARNISH	9219	675			
	44	FINISHES	111808	12913	195470		799
	45	SOLVENTS	28442	77093	260627		733
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 1990 (4)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):	BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
	23.369	1767.170	2917.000	60.000	11659.615
LBS. 1 STEEL	14832161	5142721		24000000	4002397
2 STNLS STEEL	183614				
3 ELEC STEEL					
4 ALUMINUM	1442678	204889			2317177
5 COPPER	2809049	2049			
6 BRASS	16692	145471			
7 BRONZE					
8 SILVER	11327				
9 LEAD					
10 TIN					
11 ZINC,CD					
12 TUNGSTEN	11327				
13 ALNICO,BAFE					
14 NI,NI-CR					
15 SI-CARBIDE		11268910			
16 BORIC ACID					
17 CU SALTS			354841		
18 NAF			574007		
19 ZN PHOSPHATE	2146				
20 SAND					
21 CONCRETE				240000000	
22 PORCELAIN	1311526	27660052			8110121
23 GLASS					
24 ALUMNA,BERYL					
25 GASKET MATLS	178844	819557			
26 PAPER,FIBER	321920				
27 PHENOLIC RSN	41730				
28 POLYESTER					
29 EPOXY					
30 SILICONE					
31 POLYPRPYLENE					
32 MSC PLASTICS	11327	614668			
33 POLYETHYLENE					
34 PVC					
35 ETPRP RUBBER					
36 CH,KSLF POLY					
37 BUTYL RUBBER					
38 NEOPRENE					
39 MISC INSUL					
40 PENTA			14193631		
GAL. 41 PCB OR SUBST					
42 INSL OIL	268267				
43 INSL VARNISH					
44 FINISHES	12877				
45 SOLVENTS	9538		26091234		
46 CREOSOTE			15550376		
UNIT 47 POLES			2682179		
48 CROSS ARMS			2640433		
CUFT 49 ARGON					

PROJECTION YEAR 1990 (4)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		OH COND	UG CABLE	CONNECTORS	TOTAL
		104.468	59.618	9046.031	
LBS.	1 STEEL	66306559			685230892
	2 STNLS STEEL				3784787
	3 ELEC STEEL				527653209
	4 ALUMINUM	138702280	43996763	2352980	273392571
	5 COPPER	27916591	81510571	19412084	209582322
	6 BRASS				4490919
	7 BRONZE				712204
	8 SILVER				158078
	9 LEAD		9482264		9868730
	10 TIN				119285
	11 ZINC,CD	131522			524410
	12 TUNGSTEN				70985
	13 ALNICO,BAFE				551217
	14 NI,NI-CR				3354
	15 SI-CARBIDE				11268910
	16 BORIC ACID				149952
	17 CU SALTS				354841
	18 NAF				574007
	19 ZN PHOSPHATE				258919
	20 SAND				1888287
	21 CONCRETE				240000000
	22 PORCELAIN				109528948
	23 GLASS				15146463
	24 ALUMNA,BERYL				5909814
	25 GASKET MATLS				7771688
	26 PAPER,FIBER	278050	4451645		59244860
	27 PHENOLIC RSN				1391428
	28 POLYESTER				7669228
	29 EPOXY				2189680
	30 SILICONE				130534
	31 POLYPRPYLENE				998908
	32 MSC PLASTICS				2586042
	33 POLYETHYLENE	150584957	75234718		225819675
	34 PVC	53646462	60147052		113793514
	35 ETPRP RUBBER	36814527	17816895		54631423
	36 CH,RSLF POLY	26846981	9390689		36237671
	37 BUTYL RUBBER	9667511	3975555		15573930
	38 NEOPRENE	3732149	1139219		4871368
	39 MISC INSUL	3313462			3313462
	40 PENTA				14193631
GAL.	41 PCB OR SUBST				2721689
	42 INSL OIL				68819431
	43 INSL VARNISH				470471
	44 FINISHES				1034929
	45 SOLVENTS				27227356
	46 CREOSOTE				15563619
UNIT	47 POLES				2682179
	48 CROSS ARMS				2640433
CUFT	49 ARGON				33573153

PROJECTION YEAR 1995 (5)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

			TRANSFORMERS			
PROJECTION (1000S):			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE INSTRUMENT
			1697.516	428.679	39.233	99.407 663.612
LBS.	1	STEEL	152465896	94041844	167137546	41841310 6086234
	2	STNLS STEEL	486394	301755	158918	
	3	ELEC STEEL	247312778	152557461	113552221	42880565 22776514
	4	ALUMINUM	27836718	17172047	30169680	6276196 4061655
	5	COPPER	29108826	17949767	973376	5232423
	6	BRASS	526304	323531	39730	
	7	BRONZE	69841	43552	24831	
	8	SILVER	7732	4666	745	
	9	LEAD	154274	95504	92371	
	10	TIN	3367	2178	1986	
	11	ZINC,CD	249433	152433	782	
	12	TUNGSTEN	34921	21776		
	13	ALNICO,BAFE				
	14	NI,NI-CR				
	15	SI-CARBIDE				
	16	BORIC ACID				
	17	CU SALTS				
	18	NAF				
	19	ZN PHOSPHATE	48639	48841	79459	14459 781
	20	SAND				
	21	CONCRETE				
	22	PORCELAIN	20079353	11665793	921231	1581475 234326
	23	GLASS	2581631	1555439	198648	230443
	24	ALUMNA,BERYL	623582	398192	131604	24852 3999168
	25	GASKET MATLS	3741494	2177615	285557	225925 59363
	26	PAPER,FIBER	23820848	13998951	16760934	2123695 23433
	27	PHENOLIC KSN	62358	80883	141537	6326 7811
	28	POLYESTER	2145123	1244351	86909	192036
	29	EPOXY	723356	398192	248310	67777 471777
	30	SILICONE	92290	2178	5463	2259
	31	POLYPRPYLENE				
	32	MSC PLASTICS	87302	62218	658022	813330
	33	POLYETHYLENE				
	34	PVC				
	35	ETPRP RUBBER				
	36	CH,RSLE POLY				
	37	BUTYL RUBBER				2187045
	38	NEOPRENE				
	39	MISC INSUL				
	40	PENTA				
GAL.	41	PCB OR SUBST			3103877	
	42	INSL OIL	27063476	37641625	10429025	292127
	43	INSL VARNISH	127211	186653	124155	6100 74984
	44	FINISHES	305555	192874	260726	40666 2343
	45	SOLVENTS	390363	241093	186233	43378 2343
	46	CREOSOTE		14154		
UNIT	47	POLES				
	48	CROSS ARMS				
CUFT	49	ARGON	38662109			

PROJECTION YEAR 1995 (5)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		9.500	3735.167	87.336	2006.562	58.371
LBS.	1 STEEL	11801923	1821328	177454386	6679546	1017668
	2 STNLS STEEL	37269	664929	1769907	630424	
	3 ELEC STEEL	12733654	6267680			
	4 ALUMINUM	1822051	3733240	4788022		539321
	5 COPPER	1863462	3713966	22394342	6861068	18893
	6 BRASS	11388	1605467	1460753	753074	7729
	7 BRONZE	4503	48183	637630		
	8 SILVER			70333	83648	
	9 LEAD	7971	77093			1374
	10 TIN		111592			1374
	11 ZINC,CD	3106	30066			
	12 TUNGSTEN			10627		
	13 ALNICO,BAFE		551217			
	14 NI,NI-CR		96	3864		
	15 SI-CARBIDE					
	16 BORIC ACID				165578	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	11181	37776	48305		172
	20 SAND				2085058	
	21 CONCRETE					
	22 PORCELAIN	172543		32267947	15852576	60115
	23 GLASS	44171	7372040	3091540	1177445	
	24 ALUMNA,BERYL	32093		1545770		
	25 GASKET MATLS	48139	289100	792207		
	26 PAPER,FIBER	2443205	1095688	77288	429277	858792
	27 PHENOLIC RSN		1088942			
	28 POLYESTER	27693	3566	4347478	784963	
	29 EPOXY	37269	308373	193221		
	30 SILICONE	1191		48305		
	31 POLYPRPYLENE					1288188
	32 MSC PLASTICS	62115	159005	347798	61325	19323
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					154583
	42 INSL OIL	876923				
	43 INSL VARNISH	9731	675			
	44 FINISHES	118019	12913	231865		1031
	45 SOLVENTS	30022	77093	309154		945
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1995 (5)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		24.765	1909.000	2938.000	60.000	12950.633
LBS.	1 STEEL	15718194	5555467		24000000	4445565
	2 STNLS STEEL	194582				
	3 ELEC STEEL					
	4 ALUMINUM	1528860	221333			2573748
	5 COPPER	2976854	2213			
	6 BRASS	17689	157147			
	7 BRONZE					
	8 SILVER	12003				
	9 LEAD					
	10 TIN					
	11 ZINC, CU					
	12 TUNGSTEN	12003				
	13 ALNICO, BAFE					
	14 NI, NI-CR					
	15 SI-CARBIDE		12173333			
	16 BORIC ACID					
	17 CU SALTS			357395		
	18 NAF			578140		
	19 ZN PHOSPHATE	2274				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1389872	29880000			9008119
	23 GLASS					
	24 ALUMNA, BERYL					
	25 GASKET MATLS	189528	885333			
	26 PAPER, FIBER	341151				
	27 PHENOLIC RSN	44223				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	12003	664000			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH, RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14295814		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	284292				
	43 INSL VARNISH					
	44 FINISHES	13646				
	45 SOLVENTS	10108		26279070		
	46 CREOSOTE			15662326		
UNIT	47 POLES			2701488		
	48 CROSS ARMS			2659442		
CUFT	49 ARGON					

PROJECTION YEAR 1995 (5)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND.	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		110.018	62.958	10297.258	
LBS.					
1	STEEL	69829182			779896089
2	STNLS STEEL				4244178
3	ELEC STEEL				598080873
4	ALUMINUM	146071021	46461609	2678439	295933942
5	COPPER	29399697	86077066	22097120	228669073
6	BRASS				4902810
7	BRONZE				828541
8	SILVER				179127
9	LEAD		10013492		10442080
10	TIN				120498
11	ZINC,CD	138509			574329
12	TUNGSTEN				79327
13	ALNICO,BAFE				551217
14	NI,NI-CR				3961
15	SI-CARBIDE				12173333
16	BORIC ACID				165578
17	CU SALTS				357395
18	NAF				578140
19	ZN PHOSPHATE				291888
20	SAND				2085058
21	CONCRETE				240000000
22	PORCELAIN				123113350
23	GLASS				16251357
24	ALUMNA,BERYL				6755262
25	GASKET MATLS				8694261
26	PAPER,FIBER	292822	4701041		66967123
27	PHENOLIC RSN				1432080
28	POLYESTER				8832119
29	EPOXY				2448276
30	SILICONE				151686
31	POLYPRPYLENE				1288188
32	MSC PLASTICS				2946441
33	POLYETHYLENE	158584981	79449619		238034600
34	PVC	56496501	63516691		120013192
35	ETPRP RUBBER	38770348	18815058		57585405
36	CH,KSLF POLY	28273262	9916787		38190050
37	BUTYL RUBBER	10181110	4198279		16566435
38	NEOPRENE	3930425	1203042		5133466
39	MISC INSUL	3489494			3489494
40	PENTA				14295814
GAL.					
41	PCB OR SUBST				3258459
42	INSL OIL				76587468
43	INSL VARNISH				529509
44	FINISHES				1179640
45	SOLVENTS				27569801
46	CREOSOTE				15676480
UNIT					
47	POLES				2701488
48	CROSS ARMS				2659442
CUFT					
49	ARGON				38662109

PROJECTION YEAR 2000 (6)

 BASE ELECTRICAL DEMAND CASE
 (USING 1975 TECHNOLOGY)
 TRANSFORMERS

PROJECTION (1000S):			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
			1371.683	459.262	43.000	113.842	739.958
LBS.	1	STEEL	123200534	100751018	183185443	47917133	6786432
	2	STNLS STEEL	393032	323283	174177		
	3	ELEC STEEL	199841848	163441281	124455063	49107299	25396864
	4	ALUMINUM	22493545	18397143	33066456	7187570	4528933
	5	COPPER	23521476	19230346	1066835	5992229	
	6	BRASS	425281	346613	43544		
	7	BRONZE	56435	46659	27215		
	8	SILVER	6248	4999	816		
	9	LEAD	124662	102317	101241		
	10	TIN	2721	2333	2177		
	11	ZINC,CD	201555	163308	857		
	12	TUNGSTEN	28218	23330			
	13	ALNICO,BAFE					
	14	NI,NI-CR					
	15	SI-CARBIDE					
	16	BORIC ACID					
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	39303	52325	87089	16559	871
	20	SAND					
	21	CONCRETE					
	22	PORCELAIN	16225183	12498059	1009684	1811123	261285
	23	GLASS	2086095	1666408	217722	263906	
	24	ALUMNA,BERYL	503888	426600	144241	28461	4459257
	25	GASKET MATLS	3023326	2332971	312975	258732	66192
	26	PAPER,FIBER	19248509	14997671	18370253	2432079	26128
	27	PHENOLIC RSN	50389	86653	155127	7244	8709
	28	POLYESTER	1733374	1333126	95253	219922	
	29	EPOXY	584510	426600	272152	77620	526053
	30	SILICONE	74575	2333	5987	2587	
	31	POLYPRPYLENE					
	32	MSC PLASTICS	70544	66656	721203	931435	
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,RSLE POLY					
	37	BUTYL RUBBER					2438656
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST			3401899		
	42	INSL OIL	21868725	40327070	11430380		325735
	43	INSL VARNISH	102793	199969	136076	6986	83611
	44	FINISHES	246905	206635	285759	46572	2613
	45	SOLVENTS	315434	258293	204114	49677	2613
	46	CREOSOTE		15164			
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON	31241035				

PROJECTION YEAR 2000 (6)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		9.800	3735.167	98.516	1730.419	42.692
LBS.	1 STEEL	12174615	1821328	200170563	5760307	744313
	2 STNLS STEEL	38446	664929	1996475	543665	
	3 ELEC STEEL	13135769	6267680			
	4 ALUMINUM	1879590	3733240	5400944		394454
	5 COPPER	1922308	3713966	25261072	5916848	13818
	6 BRASS	11747	1605467	1647745	649436	5653
	7 BRONZE	4646	48183	719254		
	8 SILVER			79336	72136	
	9 LEAD	8223	77093			1005
	10 TIN		111592			1005
	11 ZINC,CD	3204	30066			
	12 TUNGSTEN			11988		
	13 ALNICO,BAFE		551217			
	14 NI,NI-CR		96	4359		
	15 SI-CARBIDE					
	16 BORIC ACID				142791	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	11534	37776	54489		126
	20 SAND				1798113	
	21 CONCRETE					
	22 PORCELAIN	177991		36398611	13670945	43968
	23 GLASS	45566	7372040	3487292	1015405	
	24 ALUMNA,BERYL	33106		1743646		
	25 GASKET MATLS	49660	289100	893619		
	26 PAPER,FIBER	2520359	1095688	87182	370200	628112
	27 PHENOLIC RSN		1088942			
	28 POLYESTER	28568	3566	4904004	676937	
	29 EPOXY	38446	308373	217956		
	30 SILICONE	1228		54489		
	31 POLYPRPYLENE					942168
	32 MSC PLASTICS	64077	159005	392320	52886	14133
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					113060
	42 INSL OIL	904615				
	43 INSL VARNISH	10039	675			
	44 FINISHES	121746	12913	261547		754
	45 SOLVENTS	30971	77093	348729		691
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 2000 (6)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		25.824	1742.184	2943.000	60.000	11067.980
LBS.	1 STEEL	16390335	5070008		24000000	3799307
	2 STNLS STEEL	202903				
	3 ELEC STEEL					
	4 ALUMINUM	1594237	201992			2199599
	5 COPPER	3104150	2020			
	6 BRASS	18446	143415			
	7 BRONZE					
	8 SILVER	12517				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	12517				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		11109579			
	16 BORIC ACID					
	17 CU SALTS			358004		
	18 NAF			579123		
	19 ZN PHOSPHATE	2372				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1449306	27268967			7698595
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	197633	807969			
	26 PAPER,FIBER	355739				
	27 PHENOLIC RSN	46114				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	12517	605977			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14320143		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	296449				
	43 INSL VARNISH					
	44 FINISHES	14230				
	45 SOLVENTS	10540		26323792		
	46 CREOSOTE			15688980		
UNIT	47 POLES			2706086		
	48 CROSS ARMS			2663968		
CUFT	49 ARGON					

PROJECTION YEAR 2000 (6)

BASE ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):	OH COND.	UG CABLE	CONNECTORS	TOTAL
	103.652	66.660	8825.598	
LBS. 1 STEEL	65788638			797559972
2 STNLS STEEL				4336910
3 ELEC STEEL				581645803
4 ALUMINUM	137618876	49193603	2295643	290185823
5 COPPER	27698535	91138492	18939052	227521148
6 BRASS				4897347
7 BRONZE				902393
8 SILVER				176053
9 LEAD		10602296		11016837
10 TIN				119829
11 ZINC,CD	130494			529485
12 TUNGSTEN				76052
13 ALNICO,BAFE				551217
14 NI,NI-CR				4455
15 SI-CARBIDE				11109579
16 BORIC ACID				142791
17 CU SALTS				358004
18 NAF				579123
19 ZN PHOSPHATE				302443
20 SAND				1798113
21 CONCRETE				240000000
22 PORCELAIN				118513715
23 GLASS				16154434
24 ALUMNA,BERYL				7339199
25 GASKET MATLS				8232175
26 PAPER,FIBER	275878	4977468		65385265
27 PHENOLIC RSN				1443179
28 POLYESTER				8994749
29 EPOXY				2451709
30 SILICONE				141200
31 POLYPRPYLENE				942168
32 MSC PLASTICS				3090752
33 POLYETHYLENE	149408737	84121344		233530082
34 PVC	53227429	67251543		120478972
35 ETPRP RUBBER	36526969	19921404		56448373
36 CH,RSLE POLY	26637279	10499905		37137185
37 BUTYL RUBBER	9591998	4445143		16475797
38 NEOPRENE	3702998	1273782		4976779
39 MISC INSUL	3287581			3287581
40 PENTA				14320143
GAL. 41 PCB OR SUBST				3514959
42 INSL OIL				75152973
43 INSL VARNISH				540148
44 FINISHES				1199673
45 SOLVENTS				27621947
46 CREOSOTE				15704145
UNIT 47 POLES				2706086
48 CROSS ARMS				2663968
CUFT 49 ARGON				31241035

PROJECTION YEAR 1980 (2)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

			TRANSFORMERS			
PROJECTION (1000S):			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE INSTRUMENT
			1036.624	238.853	18.639	48.741 415.142
LBS.	1	STEEL	93106520	52398594	79404499	20515530 3807423
	2	STNLS STEEL	297027	168133	75500	
	3	ELEC STEEL	151026772	85002548	53946928	21025095 14248518
	4	ALUMINUM	16999080	9567987	14333155	3077329 2540888
	5	COPPER	17775920	10001319	462436	2565549
	6	BRASS	321398	180266	18875	
	7	BRONZE	42650	24267	11797	
	8	SILVER	4722	2600	354	
	9	LEAD	94211	53213	43884	
	10	TIN	2056	1213	944	
	11	ZINC,CD	152322	84933	372	
	12	TUNGSTEN	21325	12133		
	13	ALNICO,BAFE				
	14	NI,NI-CR				
	15	SI-CARBIDE				
	16	BORIC ACID				
	17	CU SALTS				
	18	NAF				
	19	ZN PHOSPHATE	29703	27213	37750	7090 489
	20	SAND				
	21	CONCRETE				
	22	PORCELAIN	12261881	6499991	437663	775425 146590
	23	GLASS	1576528	866665	94375	112990
	24	ALUMNA,BERYL	380804	221866	62523	12185 2501797
	25	GASKET MATLS	2284823	1213332	135664	110775 37136
	26	PAPER,FIBER	14546704	7799989	7962864	1041285 14659
	27	PHENOLIC RSN	38080	45067	67242	3102 4886
	28	POLYESTER	1309965	693332	41289	94159
	29	EPOXY	441732	221866	117968	33232 295134
	30	SILICONE	56359	1213	2595	1108
	31	POLYPRPYLENE				
	32	MSC PLASTICS	53313	34667	312616	398790
	33	POLYETHYLENE				
	34	PVC				
	35	ETPRP RUBBER				
	36	CH,ASLF POLY				
	37	BUTYL RUBBER				1368170
	38	NEOPRENE				
	39	MISC INSUL				
	40	PENTA				
GAL.	41	PCB OR SUBST			1474604	
	42	INSL OIL	16526883	20973304	4954671	182748
	43	INSL VARNISH	77684	104000	58984	2991 46909
	44	FINISHES	186594	107467	123867	19939 1466
	45	SOLVENTS	238383	134333	88476	21269 1466
	46	CREOSOTE		7887		
UNIT	47	POLES				
	48	CROSS ARMS				
CUFT	49	ARGON	23609833			

PROJECTION YEAR 1980 (2)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):			VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
			7.200	3240.968	52.471	1446.456	10.999
LBS.	1	STEEL	8944615	1580348	106613642	4815036	191762
	2	STNLS STEEL	28246	576953	1063350	454449	
	3	ELEC STEEL	9650769	5438405			
	4	ALUMINUM	1380923	3239296	2876618		101626
	5	COPPER	1412308	3222572	13454400	4945889	3560
	6	BRASS	8631	1393048	877612	542863	1456
	7	BRONZE	3413	41808	383085		
	8	SILVER			42255	60298	
	9	LEAD	6042	66893			259
	10	TIN		96828			259
	11	ZINC,CD	2354	26088			
	12	TUNGSTEN			6385		
	13	ALNICO,BAFE		478285			
	14	NI,NI-CR		84	2322		
	15	SI-CARBIDE					
	16	BORIC ACID				119359	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	8474	32778	29022		32
	20	SAND				1503041	
	21	CONCRETE					
	22	PORCELAIN	130769		19386409	11427533	11328
	23	GLASS	33477	6396647	1857381	848776	
	24	ALUMNA,BERYL	24323		928690		
	25	GASKET MATLS	36485	250849	475954		
	26	PAPER,FIBER	1851692	950717	46435	309450	161824
	27	PHENOLIC RSN		944864			
	28	POLYESTER	20988	3094	2611941	565851	
	29	EPOXY	28246	267572	116086		
	30	SILICONE	902		29022		
	31	POLYPRPYLENE					242737
	32	MSC PLASTICS	47077	137967	208955	44207	3641
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,RSLF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					29128
	42	INSL OIL	664615				
	43	INSL VARNISH	7375	585			
	44	FINISHES	89446	11205	139304		194
	45	SOLVENTS	22754	66893	185738		178
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 1980 (2)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		20.750	1428.345	2833.000	60.000	9132.020
LBS.	1 STEEL	13169898	4156691		24000000	3134749
	2 STNLS STEEL	163036				
	3 ELEC STEEL					
	4 ALUMINUM	1280995	165605			1814855
	5 COPPER	2494235	1656			
	6 BRASS	14821	117580			
	7 BRONZE					
	8 SILVER	10057				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10057				
	13 ALNICO,BAFE					
	14 NI,NI-CK					
	15 SI-CARBIDE		9108287			
	16 BORIC ACID					
	17 CU SALTS			344623		
	18 NAF			557478		
	19 ZN PHOSPHATE	1906				
	20 SAND					
	21 CONCKETE				240000000	
	22 PORCELAIN	1164541	22356704			6351992
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	158801	662421			
	26 PAPER,FIBER	285842				
	27 PHENOLIC RSN	37054				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10057	496816			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			13784902		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	238202				
	43 INSL VARNISH					
	44 FINISHES	11434				
	45 SOLVENTS	8469		25339893		
	46 CREOSOTE			15102576		
UNIT	47 POLES			2604941		
	48 CROSS ARMS			2564397		
CUFT	49 ARGON					

PROJECTION YEAR 1980 (2)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND.	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		93.813	39.979	6056.894	
LBS.					
1	STEEL	113133138			528972446
2	STNLS STEEL				2826693
3	ELEC STEEL				340339035
4	ALUMINUM	236655686	93826265	1575470	389435778
5	COPPER	47631662	60125838	12997627	177094971
6	BRASS				3476551
7	BRONZE				507019
8	SILVER				120287
9	LEAD		6994541		7259043
10	TIN				101300
11	ZINC,CD	224404			490472
12	TUNGSTEN				49900
13	ALNICO,BAFE				478285
14	NI,NI-CR				2405
15	SI-CARBIDE				9108287
16	BORIC ACID				119359
17	CU SALTS				344623
18	NAP				557478
19	ZN PHOSPHATE				174455
20	SAND				1503041
21	CONCRETE				240000000
22	PORCELAIN				80950826
23	GLASS				11786839
24	ALUMNA,BERYL				4132189
25	GASKET MATLS				5366238
26	PAPER,FIBER	474413	3283732		38729606
27	PHENOLIC RSN				1140295
28	POLYESTER				5340619
29	EPOXY				1521838
30	SILICONE				91199
31	POLYPRPYLENE				242737
32	MSC PLASTICS				1748106
33	POLYETHYLENE	256930069	55496489		312426558
34	PVC	91532312	44367153		135899464
35	ETPKP RUBBER	62813439	13142538		75955977
36	CH,KSLE POLY	45806679	6926992		52733671
37	BUTYL RUBBER	16494837	2932547		20795555
38	NEOPRENE	6367843	840339		7208182
39	MISC INSUL	5653474			5653474
40	PENTA				13784902
GAL.					
41	PCB OR SUBST				1503733
42	INSL OIL				43540424
43	INSL VARNISH				298528
44	FINISHES				690915
45	SOLVENTS				26107852
46	CREOSOTE				15110463
UNIT					
47	POLES				2604941
48	CROSS ARMS				2564397
CUFT					
49	ARGON				23609833

PROJECTION YEAR 1985 (3)

LOW ELECTRICAL DEMAND CASE

(USING 1975 TECHNOLOGY)

TRANSFORMERS

PROJECTION (1000S):			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
			1417.112	247.398	23.571	62.670	472.054
LBS.	1	STEEL	127280833	54273161	100415444	26378373	4329384
	2	STNLS STEEL	406049	174148	95477		
	3	ELEC STEEL	206460443	88043526	68221635	27033559	16201853
	4	ALUMINUM	23238513	9910283	18125801	3956756	2889219
	5	COPPER	24300488	10359118	584799	3298721	
	6	BRASS	439366	186715	23869		
	7	BRONZE	58305	25135	14918		
	8	SILVER	6455	2693	448		
	9	LEAD	128791	55117	55496		
	10	TIN	2811	1257	1193		
	11	ZINC,CD	208230	87972	470		
	12	TUNGSTEN	29152	12567			
	13	ALNICO,BAFE					
	14	NI,NI-CR					
	15	SI-CARBIDE					
	16	BORIC ACID					
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	40605	28187	47739	9116	556
	20	SAND					
	21	CONCRETE					
	22	PORCELAIN	16762547	6732529	553471	997023	166686
	23	GLASS	2155185	897671	119347	145280	
	24	ALUMNA,BERYL	520576	229804	79067	15667	2844770
	25	GASKET MATLS	3123456	1256739	171561	142432	42227
	26	PAPER,FIBER	19886003	8079035	10069889	1338859	16669
	27	PHENOLIC RSN	52058	46679	85035	3988	5556
	28	POLYESTER	1790781	718136	52214	121067	
	29	EPOXY	603868	229804	149184	42730	335594
	30	SILICONE	77045	1257	3282	1424	
	31	POLYPRPYLENE					
	32	MSC PLASTICS	72881	35907	395336	512755	
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,RSLE POLY					
	37	BUTYL RUBBER					1555734
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST			1864794		
	42	INSL OIL	22592999	21723627	6265709		207802
	43	INSL VARNISH	106198	107720	74592	3846	53339
	44	FINISHES	255082	111311	156643	25638	1667
	45	SOLVENTS	325881	139139	111888	27347	1667
	46	CREOSOTE		8169			
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON	32275712				

PROJECTION YEAR 1985 (3)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):			VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
			6.900	3590.816	63.038	1768.920	29.965
LBS.	1	STEEL	8571923	1750940	128084290	5888471	522424
	2	STNLS STEEL	27069	639232	1277496	555761	
	3	ELEC STEEL	9248654	6025456			
	4	ALUMINUM	1323385	3588963	3455933		276863
	5	COPPER	1353462	3570435	16163947	6048495	9699
	6	BRASS	8271	1543421	1054352	663886	3968
	7	BRONZE	3271	46321	460233		
	8	SILVER			50765	73741	
	9	LEAD	5790	74114			705
	10	TIN		107280			705
	11	ZINC,CD	2256	28904			
	12	TUNGSTEN			7671		
	13	ALNICO,BAFE		529914			
	14	NI,NI-CR		93	2789		
	15	SI-CARBIDE					
	16	BORIC ACID				145968	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	8121	36316	34866		88
	20	SAND				1838120	
	21	CONCRETE					
	22	PORCELAIN	125321		23290588	13975117	30861
	23	GLASS	32082	7087137	2231434	1037997	
	24	ALUMNA,BERYL	23310		1115717		
	25	GASKET MATLS	34964	277927	571805		
	26	PAPER,FIBER	1774538	1053343	55786	378436	440864
	27	PHENOLIC RSN		1046858			
	28	POLYESTER	20114	3428	3137954	691998	
	29	EPOXY	27069	296455	139465		
	30	SILICONE	865		34866		
	31	POLYPRPYLENE					661297
	32	MSC PLASTICS	45115	152860	251036	54062	9919
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH,RSLF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					79356
	42	INSL OIL	636923				
	43	INSL VARNISH	7068	648			
	44	FINISHES	85719	12414	167358		529
	45	SOLVENTS	21806	74114	223143		485
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 1985 (3)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		21.786	1648.148	2886.000	60.000	11330.468
LBS.	1 STEEL	13827441	4796350		24000000	3889411
	2 STNLS STEEL	171176				
	3 ELEC STEEL					
	4 ALUMINUM	1344952	191090			2251764
	5 COPPER	2618766	1911			
	6 BRASS	15561	135674			
	7 BRONZE					
	8 SILVER	10560				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10560				
	13 ALNICO,BAFE					
	14 NI,NI-CK					
	15 SI-CARBIDE		10509929			
	16 BORIC ACID					
	17 CU SALTS			351070		
	18 NAF			567907		
	19 ZN PHOSPHATE	2001				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1222684	25797099			7881175
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	166730	764358			
	26 PAPER,FIBER	300113				
	27 PHENOLIC RSN	38904				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10560	573269			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14042791		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	250094				
	43 INSL VARNISH					
	44 FINISHES	12005				
	45 SOLVENTS	8892		25813953		
	46 CREOSOTE			15385116		
UNIT	47 POLES			2653674		
	48 CROSS ARMS			2612372		
CUFT	49 ARGON					

PROJECTION YEAR 1985 (3)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):	OH COND	UG CABLE	CONNECTORS	TOTAL
	117.772	41.014	7996.011	
LBS. 1 STEEL	74750699			578759143
2 STNLS STEEL				3346408
3 ELEC STEEL				421235127
4 ALUMINUM	156366015	30267423	2079857	259266817
5 COPPER	31471769	56074919	17158822	173015352
6 BRASS				4075084
7 BRONZE				608183
8 SILVER				144661
9 LEAD		6523291		6843304
10 TIN				113246
11 ZINC,CD	148271			476103
12 TUNGSTEN				59950
13 ALNICO,BAFE				529914
14 NI,NI-CR				2882
15 SI-CARBIDE				10509929
16 BORIC ACID				145968
17 CU SALTS				351070
18 NAF				567907
19 ZN PHOSPHATE				207593
20 SAND				1838120
21 CONCRETE				240000000
22 PORCELAIN				97535100
23 GLASS				13706132
24 ALUMNA,BERYL				4828911
25 GASKET MATLS				6552199
26 PAPER,FIBER	313460	3062494		46769491
27 PHENOLIC RSM				1279077
28 POLYESTER				6535692
29 EPOXY				1824168
30 SILICONE				118739
31 POLYPRPYLENE				661297
32 MSC PLASTICS				2113700
33 POLYETHYLENE	169761951	51757468		221519420
34 PVC	60478339	41377960		101856299
35 ETPRP RUBBER	41502857	12257072		53759930
36 CH,RSLF POLY	30265944	6460293		36726237
37 BUTYL RUBBER	10898669	2734970		15189372
38 NEOPRENE	4207439	783722		4991160
39 MISC INSUL.	3735432			3735432
40 PENTA				14042791
GAL. 41 PCB OR SUBST				1944150
42 INSL OIL				51677153
43 INSL VARNISH				353411
44 FINISHES				828365
45 SOLVENTS				26748315
46 CREOSOTE				15393285
UNIT 47 POLES				2653674
48 CROSS ARMS				2612372
CUFT 49 ARGON				32275712

PROJECTION YEAR 1990 (4)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
PROJECTION (1000S):		1226.589	200.819	26.561	73.857	531.742
LBS.	1 STEEL	110168617	44054850	113153222	31087083	4876805
	2 STNLS STEEL	351458	141360	107589		
	3 ELEC STEEL	178702960	71467081	76875603	31859224	18250467
	4 ALUMINUM	20114221	8044419	20425073	4663062	3254541
	5 COPPER	21033419	8408749	658982	3887564	
	6 BRASS	380296	151562	26897		
	7 BRONZE	50466	20403	16811		
	8 SILVER	5587	2186	504		
	9 LEAD	111475	44740	62536		
	10 TIN	2433	1020	1345		
	11 ZINC,CD	180235	71409	530		
	12 TUNGSTEN	25233	10201			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	35146	22880	53794	10743	626
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	14508914	5464958	623679	1174998	187762
	23 GLASS	1865432	728661	134486	171214	
	24 ALUMNA,BERYL	450587	186537	89097	18464	3204472
	25 GASKET MATLS	2703524	1020126	193324	167857	47566
	26 PAPER,FIBER	17212438	6557950	11347263	1577854	18776
	27 PHENOLIC KSN	45059	37890	95821	4700	6259
	28 POLYESTER	1550021	582929	58838	142678	
	29 EPOXY	522681	186537	168108	50357	378028
	30 SILICONE	66687	1020	3698	1679	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	63082	29146	445485	604285	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,KSLE POLY					
	37 BUTYL RUBBER					1752445
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			2101345		
	42 INSL OIL	19555493	17633599	7060519		234077
	43 INSL VARNISH	91920	87439	84054	4532	60084
	44 FINISHES	220788	90354	176513	30214	1878
	45 SOLVENTS	282068	112942	126081	32229	1878
	46 CREOSOTE		6631			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	27936418				

PROJECTION YEAR 1990 (4)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		6.600	2995.872	71.524	1607.452	25.263
LBS.	1 STEEL	8199231	1460835	145326641	5350968	440447
	2 STNLS STEEL	25892	533321	1449469	505031	
	3 ELEC STEEL	8846538	5027129			
	4 ALUMINUM	1265846	2994326	3921161		233419
	5 COPPER	1294615	2978868	18339893	5496385	8177
	6 BRASS	7912	1287699	1196286	603286	3345
	7 BRONZE	3129	38646	522188		
	8 SILVER			57599	67010	
	9 LEAD	5538	61834			595
	10 TIN		89505			595
	11 ZINC,CD	2158	24115			
	12 TUNGSTEN			8703		
	13 ALNICO,BAFE		442115			
	14 NI,NI-CR		77	3165		
	15 SI-CARBIDE					
	16 BORIC ACID				132644	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	7768	30299	39560		74
	20 SAND				1670335	
	21 CONCRETE					
	22 PORCELAIN	119872		26425903	12699460	26018
	23 GLASS	30687	5912905	2531823	943248	
	24 ALUMINA,BERYL	22296		1265912		
	25 GASKET MATLS	33444	231879	648780		
	26 PAPER,FIBER	1697385	878820	63296	343893	371686
	27 PHENOLIC RSN		873410			
	28 POLYESTER	19239	2860	3560376	628832	
	29 EPOXY	25892	247337	158239		
	30 SILICONE	827		39560		
	31 POLYPRPYLENE					557528
	32 MSC PLASTICS	43154	127533	284830	49128	8363
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					66903
	42 INSL OIL	609231				
	43 INSL VARNISH	6761	541			
	44 FINISHES	81992	10357	189887		446
	45 SOLVENTS	20858	61834	253182		409
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1990 (4)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		22.674	1514.186	2917.000	60.000	10229.632
LBS.	1 STEEL	14391049	4406501		24000000	3511527
	2 STNLS STEEL	178153				
	3 ELEC STEEL					
	4 ALUMINUM	1399772	175558			2032989
	5 COPPER	2725507	1756			
	6 BRASS	16196	124646			
	7 BRONZE					
	8 SILVER	10990				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10990				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		9655679			
	16 BORIC ACID					
	17 CU SALTS			354841		
	18 NAF			574007		
	19 ZN PHOSPHATE	2082				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1272520	23700303			7115462
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	173526	702231			
	26 PAPER,FIBER	312346				
	27 PHENOLIC KSN	40489				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10990	526673			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14193631		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	260288				
	43 INSL VARNISH					
	44 FINISHES	12494				
	45 SOLVENTS	9255		26091234		
	46 CKEOSOTE			15550376		
UNIT	47 POLES			2682179		
	48 CROSS ARMS			2640433		
CUFT	49 ARGON					

PROJECTION YEAR 1990 (4)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		83.565	35.375	6814.187	
LBS. 1	STEEL	53039281			563467057
2	STNLS STEEL				3292273
3	ELEC STEEL				391029002
4	ALUMINUM	110949343	26105966	1772451	207352148
5	COPPER	22330761	48365199	14622719	150152595
6	BRASS				3798124
7	BRONZE				651643
8	SILVER				143876
9	LEAD		5626406		5913124
10	TIN				94898
11	ZINC,CD	105205			383652
12	TUNGSTEN				55127
13	ALNICO,BAFE				442115
14	NI,NI-CR				3242
15	SI-CARBIDE				9655679
16	BORIC ACID				132644
17	CU SALTS				354841
18	NAF				574007
19	ZN PHOSPHATE				202972
20	SAND				1670335
21	CONCRETE				240000000
22	PORCELAIN				93319849
23	GLASS				12318457
24	ALUMNA,BERYL				5237365
25	GASKET MATLS				5922256
26	PAPEK,FIBER	222415	2641433		43245554
27	PHENOLIC RSN				1103628
28	POLYESTER				6545773
29	EPOXY				1737179
30	SILICONE				113471
31	POLYPRPYLENE				557528
32	MSC PLASTICS				2192669
33	POLYETHYLENE	120454416	44641353		165095768
34	PVC	42912343	35688919		78601262
35	ETPRP RUBBER	29448309	10571852		40020161
36	CH,KSLF POLY	21475169	5572069		27047239
37	BUTYL RUBBER	7733139	2358940		11844524
38	NEOPRENE	2985384	675968		3661352
39	MISC INSUL	2650472			2650472
40	PENTA				14193631
GAL. 41	PCB OR SUBST				2168248
42	INSL OIL				45353206
43	INSL VARNISH				335331
44	FINISHES				814923
45	SOLVENTS				26991969
46	CREOSOTE				15557006
UNIT 47	POLES				2682179
48	CROSS ARMS				2640433
CUFT 49	ARGON				27936418

PROJECTION YEAR 1995 (5)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
PROJECTION (1000S):		1443.635	166.304	31.321	84.395	583.102
LBS.	1 STEEL	129663051	36483091	133431425	35522623	5347847
	2 STNLS STEEL	413649	117064	126870		
	3 ELEC STEEL	210324605	59183949	90652489	36404934	20013247
	4 ALUMINUM	23673450	6661815	24085453	5328393	3568892
	5 COPPER	24755302	6963527	777078	4442246	
	6 BRASS	447589	125512	31717		
	7 BRONZE	59396	16896	19823		
	8 SILVER	6576	1810	595		
	9 LEAD	131201	37050	73743		
	10 TIN	2864	845	1586		
	11 ZINC,CD	212128	59136	624		
	12 TUNGSTEN	29698	8448			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BOKIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	41365	18948	63435	12276	686
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	17076279	4525689	735449	1342648	205898
	23 GLASS	2195522	603425	158587	195643	
	24 ALUMNA,BERYL	530319	154477	105064	21099	2513986
	25 GASKET MATLS	3181915	844795	227969	191807	52161
	26 PAPER,FIBER	20258194	5430827	13380807	1802984	20590
	27 PHENOLIC KSN	53032	31378	112993	5371	6863
	28 POLYESTER	1824298	482740	69382	163036	
	29 EPOXY	615170	154477	198234	57542	414540
	30 SILICONE	78487	845	4361	1918	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	74245	24137	525321	690505	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					1921711
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			2477927		
	42 INSL OIL	23015854	14602891	8325835		256686
	43 INSL VARNISH	108185	72411	99117	5179	65887
	44 FINISHES	259856	74825	208146	34525	2059
	45 SOLVENTS	331980	93531	148676	36827	2059
	46 CREOSOTE		5491			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	32879792				

PROJECTION YEAR 1995 (5)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):			VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
			6.200	2342.560	79.518	1791.398	43.986
LBS.	1	STEEL	7702308	1142270	161569317	5963297	766873
	2	STNLS STEEL	24323	417019	1611471	562823	
	3	ELEC STEEL	8310385	3930859			
	4	ALUMINUM	1189128	2341351	4359416		406410
	5	COPPER	1216154	2329264	20389682	6125355	14237
	6	BRASS	7432	1006890	1329991	672322	5824
	7	BRONZE	2939	30219	580552		
	8	SILVER			64037	74678	
	9	LEAD	5202	48350			1035
	10	TIN		69987			1035
	11	ZINC, CD	2027	18857			
	12	TUNGSTEN			9676		
	13	ALNICO, BAFE		345703			
	14	NI, NI-CR		60	3518		
	15	SI-CARBIDE					
	16	BORIC ACID				147823	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	7297	23692	43981		129
	20	SAND				1861477	
	21	CONCRETE					
	22	PORCELAIN	112607		29379438	14152701	45301
	23	GLASS	28827	4623474	2814796	1051187	
	24	ALUMNA, BERYL	20945		1407398		
	25	GASKET MATLS	31417	181313	721292		
	26	PAPER, FIBER	1594513	687175	70370	383245	647150
	27	PHENOLIC RSN		682944			
	28	POLYESTER	18073	2236	3958308	700791	
	29	EPOXY	24323	193400	175925		
	30	SILICONE	777		43981		
	31	POLYPRPYLENE					970726
	32	MSC PLASTICS	40538	99722	316665	54749	14561
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH, KSLF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					116487
	42	INSL OIL	572308				
	43	INSL VARNISH	6351	423			
	44	FINISHES	77023	8099	211110		777
	45	SOLVENTS	19594	48350	281480		712
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 1995 (5)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S): BREAKERS ARRESTERS WOOD POLES CONCR POLES INSULATORS

		23.852	1617.316	2938.000	60.000	11483.717
LBS.	1	STEEL	15138718	4706624	24000000	3942017
	2	STNLS STEEL	187409			
	3	ELEC STEEL				
	4	ALUMINUM	1472496	187515		2282220
	5	COPPER	2867108	1875		
	6	BRASS	17037	133136		
	7	BRONZE				
	8	SILVER	11561			
	9	LEAD				
	10	TIN				
	11	ZINC, CU				
	12	TUNGSTEN	11561			
	13	ALNICO, BAFE				
	14	NI, NI-CR				
	15	SI-CARBIDE		10313319		
	16	BORIC ACID				
	17	CU SALTS			357395	
	18	NAF			578140	
	19	ZN PHOSPHATE	2190			
	20	SAND				
	21	CONCRETE			240000000	
	22	PORCELAIN	1338633	25314511		7987771
	23	GLASS				
	24	ALUMNA, BERYL				
	25	GASKET MATLS	182541	750060		
	26	PAPER, FIBER	328573			
	27	PHENOLIC RSN	42593			
	28	POLYESTER				
	29	EPOXY				
	30	SILICONE				
	31	POLYPRPYLENE				
	32	MSC PLASTICS	11561	562545		
	33	POLYETHYLENE				
	34	PVC				
	35	ETPRP RUBBER				
	36	CH, RSLF POLY				
	37	BUTYL RUBBER				
	38	NEOPRENE				
	39	MISC INSUL				
	40	PENTA			14295814	
GAL.	41	PCB OR SUBST				
	42	INSL OIL	273811			
	43	INSL VARNISH				
	44	FINISHES	13143			
	45	SOLVENTS	9736		26279070	
	46	CREOSOTE			15662326	
UNIT	47	POLES			2701488	
	48	CROSS ARMS			2659442	
CUFT	49	ARGON				

PROJECTION YEAR 1995 (5)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		OH COND	UG CABLE	CONNECTORS	TOTAL
		86.486	31.197	7724.004	
LBS.	1 STEEL	54893260			620272719
	2 STNLS STEEL				3460628
	3 ELEC STEEL				428820468
	4 ALUMINUM	114827558	23022695	2009105	215415898
	5 COPPER	23111329	42652979	16575116	152221251
	6 BRASS				3777451
	7 BRONZE				709825
	8 SILVER				159257
	9 LEAD		4961894		5258476
	10 TIN				76317
	11 ZINC,CD	108883			401654
	12 TUNGSTEN				59383
	13 ALNICO,BAFE				345703
	14 NI,NI-CR				3579
	15 SI-CARBIDE				10313319
	16 BORIC ACID				147823
	17 CU SALTS				357395
	18 NAF				578140
	19 ZN PHOSPHATE				213999
	20 SAND				1861477
	21 CONCRETE				240000000
	22 PORCELAIN				102216924
	23 GLASS				11671462
	24 ALUMNA,BEAYL				5753288
	25 GASKET MATLS				6365270
	26 PAPER,FIBER	230190	2329464		47164083
	27 PHENOLIC RSN				935175
	28 POLYESTER				7218865
	29 EPOXY				1833612
	30 SILICONE				130369
	31 POLYPRPYLENE				970726
	32 MSC PLASTICS				2414548
	33 POLYETHYLENE	124664879	39368941		164033820
	34 PVC	44412336	31473843		75886179
	35 ETPRP RUBBER	30477670	9323253		39800923
	36 CH,RSLF POLY	22225830	4913975		27139805
	37 BUTYL RUBBER	8003450	2080335		12005495
	38 NEOPRENE	3089737	596132		3685869
	39 MISC INSUL	2743119			2743119
	40 PENTA				14295814
GAL.	41 PCB OR SUBST				2594414
	42 INSL OIL				47047386
	43 INSL VARNISH				357553
	44 FINISHES				889562
	45 SOLVENTS				27252013
	46 CREOSOTE				15667817
UNIT	47 POLES				2701488
	48 CROSS ARMS				2659442
CUFT	49 ARGON				32879792

PROJECTION YEAR 2000 (6)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS			DRY TYPE	INSTRUMENT
PROJECTION (1000S):		OVERHEAD	UNDERGROUND	SMALL POWER		
		1120.999	169.008	33.480	94.643	637.238
LBS.	1 STEEL	100684834	37076283	142629038	39836099	5844349
	2 STNLS STEEL	321203	118968	135615		
	3 ELEC STEEL	163319449	60146243	96901291	40825549	21871304
	4 ALUMINUM	18382703	6770132	25745696	5975415	3900233
	5 COPPER	19222773	7076750	830643	4981663	
	6 BRASS	347558	127553	33904		
	7 BRONZE	46121	17171	21190		
	8 SILVER	5106	1840	636		
	9 LEAD	101879	37653	78826		
	10 TIN	2224	859	1695		
	11 ZINC,CD	164720	60097	667		
	12 TUNGSTEN	23061	8585			
	13 ALNICO,BAFE					
	14 NI,NI-CK					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	32120	19256	67808	13766	750
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	13259925	4599274	786144	1505684	225013
	23 GLASS	1704847	613237	169519	219400	
	24 ALUMINA,BERYL	411799	156989	112306	23661	3840229
	25 GASKET MATLS	2470793	858531	243684	215098	57003
	26 PAPER,FIBER	15730718	5519129	14303165	2021919	22501
	27 PHENOLIC KSN	41180	31888	120782	6023	7500
	28 POLYESTER	1416588	490589	74165	182833	
	29 EPOXY	477687	156989	211899	64529	453027
	30 SILICONE	60946	859	4662	2151	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	57652	24529	561532	774352	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,KSLF POLY					
	37 BUTYL RUBBER					2100125
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			2648734		
	42 INSL OIL	17872073	14840325	8899747		280517
	43 INSL VARNISH	84007	73588	105949	5808	72004
	44 FINISHES	201781	76041	222494	38718	2250
	45 SOLVENTS	257786	95052	158924	41299	2250
	46 CREOSOTE		5580			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	25531533				

PROJECTION YEAR 2000 (6)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		6.000	2133.664	87.292	1517.964	30.865
LBS.	1 STEEL	7453846	1040409	177364984	5053076	538115
	2 STNLS STEEL	23538	379832	1769015	476915	
	3 ELEC STEEL	8042308	3580328			
	4 ALUMINUM	1150769	2132563	4785610		285178
	5 COPPER	1176923	2121553	22383059	5190398	9990
	6 BRASS	7192	917101	1460017	569700	4087
	7 BRONZE	2844	27524	637309		
	8 SILVER			70297	63279	
	9 LEAD	5035	44038			727
	10 TIN		63746			727
	11 ZINC,CD	1962	17175			
	12 TUNGSTEN			10622		
	13 ALNICO,BAFE		314875			
	14 NI,NI-CH		55	3862		
	15 SI-CARBIDE					
	16 BORIC ACID				125260	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	7062	21579	48281		91
	20 SAND				1577346	
	21 CONCRETE					
	22 PORCELAIN	108974		32251690	11992472	31787
	23 GLASS	27897	4211179	3089982	890737	
	24 ALUMNA,BERYL	20269		1544991		
	25 GASKET MATLS	30404	165144	791808		
	26 PAPER,FIBER	1543077	625897	77250	324748	454106
	27 PHENOLIC KSN		622043			
	28 POLYESTER	17490	2037	4345288	593825	
	29 EPOXY	23538	176154	193124		
	30 SILICONE	752		48281		
	31 POLYPRPYLENE					681159
	32 MSC PLASTICS	39231	90829	347623	46393	10217
	33 POLYETHYLENE					
	34 PVC					
	35 ETFRP RUBBER					
	36 CH,KSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					81739
	42 INSL OIL	553846				
	43 INSL VARNISH	6146	385			
	44 FINISHES	74538	7376	231749		545
	45 SOLVENTS	18962	44038	308998		500
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 2000 (6)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		24.704	1436.554	2943.000	60.000	9619.536
LBS.	1 STEEL	15679478	4180580		24000000	3302099
	2 STNLS STEEL	194103				
	3 ELEC STEEL					
	4 ALUMINUM	1525094	166557			1911742
	5 COPPER	2969522	1666			
	6 BRASS	17646	118255			
	7 BRONZE					
	8 SILVER	11974				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	11974				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		9160634			
	16 BORIC ACID					
	17 CU SALTS			358004		
	18 NAF			579123		
	19 ZN PHOSPHATE	2269				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1386449	22485193			6691096
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	189061	666228			
	26 PAPER,FIBER	340310				
	27 PHENOLIC RSN	44114				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	11974	499671			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14320143		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	283592				
	43 INSL VARNISH					
	44 FINISHES	13612				
	45 SOLVENTS	10083			26323792	
	46 CREOSOTE				15688980	
UNIT	47 POLES				2706086	
	48 CROSS ARMS				2663968	
CUFT	49 ARGON					

PROJECTION YEAR 2000 (6)

LOW ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		OH COND.	UG CABLE	CONNECTORS	TOTAL
		78.193	31.524	6129.319	
LBS.	1 STEEL	49629635			614312826
	2 STNLS STEEL				3419190
	3 ELEC STEEL				394686472
	4 ALUMINUM	103816933	23264014	1594308	201406947
	5 COPPER	20895222	43100058	13153045	143113265
	6 BRASS				3603014
	7 BKONZE				752159
	8 SILVER				153132
	9 LEAD		5013903		5282061
	10 TIN				69250
	11 ZINC,CD	98442			343063
	12 TUNGSTEN				54242
	13 ALNICO,BAFE				314875
	14 NI,NI-CR				3918
	15 SI-CARBIDE				9160634
	16 BORIC ACID				125260
	17 CU SALTS				358004
	18 NAF				579123
	19 ZN PHOSPHATE				212981
	20 SAND				1577346
	21 CONCRETE				240000000
	22 PORCELAIN				95323703
	23 GLASS				10926798
	24 ALUMNA,BERYL				6110244
	25 GASKET MATLS				5687755
	26 PAPER,FIBER	208117	2353881		43524817
	27 PHENOLIC KSN				873531
	28 POLYESTER				7122814
	29 EPOXY				1756947
	30 SILICONE				117650
	31 POLYPRPYLENE				681159
	32 MSC PLASTICS				2464003
	33 POLYETHYLENE	112710969	39781597		152492566
	34 PVC	40153710	31803745		71957455
	35 ETPRP RUBBER	27555216	9420977		36976193
	36 CH,KSLF POLY	20094632	4965482		25060114
	37 BUTYL RUBBER	7236012	2102140		11438278
	38 NEOPRENE	2793467	602381		3395848
	39 MISC INSUL	2480085			2480085
	40 PENTA				14320143
GAL.	41 PCB OR SUBST				2730473
	42 INSL OIL				42730099
	43 INSL VARNISH				347888
	44 FINISHES				869105
	45 SOLVENTS				27261684
	46 CREOSOTE				15694561
UNIT	47 POLES				2706086
	48 CROSS ARMS				2663968
CUFT	49 ARGON				25531533

PROJECTION YEAR 1980 (2)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
PROJECTION (1000S):		1561.083	341.360	23.669	54.327	447.068
LBS.	1 STEEL	140211885	74886160	100832936	22866728	4100228
	2 STNLS STEEL	447302	240290	95874		
	3 ELEC STEEL	227435720	121482543	68505277	23434692	15344283
	4 ALUMINUM	25599421	13674218	18201161	3430009	2736292
	5 COPPER	26769288	14293521	587231	2859576	
	6 BRASS	484003	257630	23969		
	7 BRONZE	64228	34681	14980		
	8 SILVER	7111	3716	449		
	9 LEAD	141875	76050	55727		
	10 TIN	3097	1734	1198		
	11 ZINC,CD	229385	121383	472		
	12 TUNGSTEN	32114	17340			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	44730	38892	47937	7902	526
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	18465533	9289550	555772	864293	157863
	23 GLASS	2374140	1238607	119843	125940	
	24 ALUMNA,BERYL	573464	317083	79396	13582	2694195
	25 GASKET MATLS	3440782	1734049	172274	123470	39992
	26 PAPER,FIBER	21906315	11147460	10111756	1160622	15786
	27 PHENOLIC RSN	57346	64408	85388	3457	5262
	28 POLYESTER	1972715	990885	52431	104950	
	29 EPOXY	665218	317083	149804	37041	317831
	30 SILICONE	84873	1734	3296	1235	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	80285	49544	396980	444494	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					1473388
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			1872547		
	42 INSL OIL	24888326	29974282	6291759		196803
	43 INSL VARNISH	116987	148633	74902	3334	50516
	44 FINISHES	280997	153587	157294	22225	1579
	45 SOLVENTS	358988	191984	112353	23706	1579
	46 CREOSOTE		11271			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	35554752				

PROJECTION YEAR 1980 (2)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		9.500	3393.594	55.789	1890.935	35.336
LBS.	1 STEEL	11801923	1654771	113355349	6294641	616065
	2 STNLS STEEL	37269	604123	1130591	594096	
	3 ELEC STEEL	12733654	5694514			
	4 ALUMINUM	1822051	3391843	3058521		326488
	5 COPPER	1863462	3374332	14305188	6465703	11437
	6 BRASS	11388	1458650	933108	709679	4679
	7 BRONZE	4503	43777	407309		
	8 SILVER			44927	78827	
	9 LEAD	7971	70043			832
	10 TIN		101388			832
	11 ZINC,CD	3106	27317			
	12 TUNGSTEN			6788		
	13 ALNICO,BAFE		500809			
	14 NI,NI-CR		88	2469		
	15 SI-CARBIDE					
	16 BORIC ACID				156037	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	11181	34321	30857		104
	20 SAND				1964908	
	21 CONCRETE					
	22 PORCELAIN	172543		20612308	14939080	36392
	23 GLASS	44171	6697883	1974832	1109595	
	24 ALUMNA,BERYL	32093		987416		
	25 GASKET MATLS	48139	262662	506051		
	26 PAPER,FIBER	2443205	995489	49371	404540	519886
	27 PHENOLIC RSN		989360			
	28 POLYESTER	27693	3239	2777107	739730	
	29 EPOXY	37269	280173	123427		
	30 SILICONE	1191		30857		
	31 POLYPRPYLENE					779829
	32 MSC PLASTICS	62115	144464	222169	57791	11697
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,MSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					93579
	42 INSL OIL	876923				
	43 INSL VARNISH	9731	613			
	44 FINISHES	118019	11732	148112		624
	45 SOLVENTS	30022	70043	197483		572
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1980 (2)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		21.341	1782.580	2833.000	60.000	12162.328
LBS.	1 STEEL	13545002	5187566		24000000	4174964
	2 STNLS STEEL	167679				
	3 ELEC STEEL					
	4 ALUMINUM	1317480	206676			2417084
	5 COPPER	2565275	2067			
	6 BRASS	15244	146740			
	7 BRONZE					
	8 SILVER	10344				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	10344				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		11367177			
	16 BORIC ACID					
	17 CU SALTS			344623		
	18 NAF			557478		
	19 ZN PHOSPHATE	1960				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1197709	27901252			8459795
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	163324	826704			
	26 PAPER,FIBER	293983				
	27 PHENOLIC RSN	38109				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	10344	620028			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,MSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			13784902		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	244986				
	43 INSL VARNISH					
	44 FINISHES	11759				
	45 SOLVENTS	8711		25339893		
	46 CREOSOTE			15102576		
UNIT	47 POLES			2604941		
	48 CROSS ARMS			2564397		
CUFT	49 ARGON					

PROJECTION YEAR 1980 (2)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):	OH COND	UG CABLE	CONNECTORS	TOTAL
	108.325	52.388	9181.977	
LBS. 1 STEEL	68754623			592282840
2 STNLS STEEL				3317224
3 ELEC STEEL				474630683
4 ALUMINUM	143823223	38661183	2388341	261053993
5 COPPER	28947283	71625613	19703813	193373789
6 BRASS				4045089
7 BRONZE				569479
8 SILVER				145375
9 LEAD		8332330		8684828
10 TIN				108249
11 ZINC,CD	136377			518041
12 TUNGSTEN				66587
13 ALNICO,BAFE				500809
14 NI,NI-CR				2556
15 SI-CARBIDE				11367177
16 BORIC ACID				156037
17 CU SALTS				344623
18 NAF				557478
19 ZN PHOSPHATE				218411
20 SAND				1964908
21 CONCRETE				240000000
22 PORCELAIN				102652089
23 GLASS				13685010
24 ALUMNA,BERYL				4697229
25 GASKET MATLS				7317448
26 PAPER,FIBER	288316	3911785		53248515
27 PHENOLIC RSN				1243331
28 POLYESTER				6668752
29 EPOXY				1927846
30 SILICONE				123184
31 POLYPRPYLENE				779829
32 MSC PLASTICS				2099912
33 POLYETHYLENE	156144613	66110846		222255459
34 PVC	55627111	52852893		108480004
35 ETPRP RUBBER	38173734	15656203		53829937
36 CH,RSLF POLY	27838182	8251861		36090043
37 BUTYL RUBBER	10024439	3493432		14991259
38 NEOPRENE	3869942	1001063		4871005
39 MISC INSUL	3435797			3435797
40 PENTA				13784902
GAL. 41 PCB OR SUBST				1966127
42 INSL OIL				62473079
43 INSL VARNISH				404715
44 FINISHES				905929
45 SOLVENTS				26335334
46 CREOSOTE				15113847
UNIT 47 POLES				2604941
48 CROSS ARMS				2564397
CUFT 49 ARGON				35554752

PROJECTION YEAR 1985 (3)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
PROJECTION (1000S):		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
		2171.672	481.249	33.157	70.826	516.473
LBS.	1 STEEL	195053194	105574436	141253017	29811307	4736767
	2 STNLS STEEL	622256	338760	134307		
	3 ELEC STEEL	316393033	171265972	95966431	30551761	17726404
	4 ALUMINUM	35612166	19277899	25497313	4471696	3161087
	5 COPPER	37239604	20150992	822629	3728023	
	6 BRASS	673312	363207	33577		
	7 BRONZE	89350	48893	20985		
	8 SILVER	9892	5239	630		
	9 LEAD	197367	107216	78066		
	10 TIN	4308	2445	1679		
	11 ZINC,CD	319105	171126	661		
	12 TUNGSTEN	44675	24447			
	13 ALNICO,BAPE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	62226	54830	67153	10302	608
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	25687987	13096399	778560	1126777	182370
	23 GLASS	3302741	1746187	167884	164188	
	24 ALUMINA,BERYL	797764	447024	111223	17707	3112455
	25 GASKET MATLS	4786581	2444661	241333	160968	46201
	26 PAPER,FIBER	30474569	15715679	14165174	1513101	18237
	27 PHENOLIC RSN	79776	90802	119617	4507	6079
	28 POLYESTER	2744307	1396949	73449	136823	
	29 EPOXY	925406	447024	209854	48290	367172
	30 SILICONE	118069	2445	4617	1610	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	111687	69847	556114	579485	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,KSLF POLY					
	37 BUTYL RUBBER					1702124
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			2623180		
	42 INSL OIL	34622939	42257713	8813886		227355
	43 INSL VARNISH	162744	209542	104927	4346	58359
	44 FINISHES	390904	216527	220347	28974	1824
	45 SOLVENTS	499400	270659	157391	30906	1824
	46 CREOSOTE		15890			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	49461342				

PROJECTION YEAR 1985 (3)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG 10.600	METERS 3684.205	SWITCHGEAR 66.082	FUSES 2408.410	CAPACITORS 68.101
LBS.	1 STEEL	13168462	1796478	134269267	8017238	1187306
	2 STNLS STEEL	41585	655857	1339184	756676	
	3 ELEC STEEL	14208077	6182164			
	4 ALUMINUM	2033026	3682304	3622814		629222
	5 COPPER	2079231	3663294	16944477	8235113	22043
	6 BRASS	12706	1583562	1105265	903890	9018
	7 BRONZE	5025	47526	482457		
	8 SILVER			53216	100399	
	9 LEAD	8894	76041			1603
	10 TIN		110070			1603
	11 ZINC, CD	3465	29656			
	12 TUNGSTEN			8041		
	13 ALNICO, BAFB		543696			
	14 NI, NI-CR		95	2924		
	15 SI-CARBIDE					
	16 BORIC ACID				198738	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	12475	37260	36550		200
	20 SAND				2502627	
	21 CONCRETE					
	22 PORCELAIN	192521		24415252	19027322	70136
	23 GLASS	49285	7271457	2339186	1413248	
	24 ALUMNA, BERYL	35809		1169593		
	25 GASKET, MATLS	53713	285155	599416		
	26 PAPER, FIBER	2726103	1080738	58480	515247	1001946
	27 PHENOLIC RSN		1074085			
	28 POLYESTER	30900	3517	3289480	942165	
	29 EPOXY	41585	304166	146199		
	30 SILICONE	1328		36550		
	31 POLYPRPYLENE					1502919
	32 MSC PLASTICS	69308	156835	263158	73607	22544
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH, RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					180350
	42 INSL OIL	978462				
	43 INSL VARNISH	10858	665			
	44 FINISHES	131685	12737	175439		1202
	45 SOLVENTS	33499	76041	233919		1102
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1985 (3)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		23.264	2206.600	2886.000	60.000	15690.292
LBS.	1 STEEL	14765518	6421526		24000000	5386008
	2 STNLS STEEL	182789				
	3 ELEC STEEL					
	4 ALUMINUM	1436196	255838			3118215
	5 COPPER	2796428	2558			
	6 BRASS	16617	181645			
	7 BRONZE					
	8 SILVER	11276				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	11276				
	13 ALNICO,BAPE					
	14 NI,NI-CR					
	15 SI-CARBIDE		14071072			
	16 BORIC ACID					
	17 CU SALTS			351070		
	18 NAF			567907		
	19 ZN PHOSPHATE	2136				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1305633	34538087			10913753
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	178041	1023351			
	26 PAPER,FIBER	320473				
	27 PHENOLIC RSN	41543				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	11276	767513			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,KSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14042791		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	267061				
	43 INSL VARNISH					
	44 FINISHES	12819				
	45 SOLVENTS	9496		25813953		
	46 CREOSOTE			15385116		
UNIT	47 POLES			2653674		
	48 CROSS ARMS			2612372		
CUFT	49 ARGON					

PROJECTION YEAR 1985 (3)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		135.818	69.322	12922.699	
LBS.					
1	STEEL	86204620			771645143
2	STNLS STEEL				4071413
3	ELEC STEEL				652293843
4	ALUMINUM	180325710	51158100	3361347	337642933
5	COPPER	36294134	94778016	27731114	254487657
6	BRASS				4882799
7	BRONZE				694236
8	SILVER				180652
9	LEAD		11025688		11494876
10	TIN				120104
11	ZINC,CD	170990			695005
12	TUNGSTEN				88438
13	ALNICO,BAFE				543696
14	NI,NI-CR				3019
15	SI-CARBIDE				14071072
16	BORIC ACID				198738
17	CU SALTS				351070
18	NAF				567907
19	ZN PHOSPHATE				283741
20	SAND				2502627
21	CONCRETE				240000000
22	PORCELAIN				131334798
23	GLASS				16454175
24	ALUMNA,BERYL				5691574
25	GASKET MATLS				9819420
26	PAPER,FIBER	361491	5176238		73127474
27	PHENOLIC RSN				1416409
28	POLYESTER				8617590
29	EPOXY				2489696
30	SILICONE				164618
31	POLYPRPYLENE				1502919
32	MSC PLASTICS				2681375
33	POLYETHYLENE	195774282	87480646		283254928
34	PVC	69745330	69937166		139682496
35	ETPRP RUBBER	47862269	20716945		68579213
36	CH,RSLE POLY	34903542	10919209		45822751
37	BUTYL RUBBER	12568653	4622655		18893432
38	NEOPRENE	4852137	1324649		6176786
39	MISC INSUL	4307806			4307806
40	PENTA				14042791
GAL.					
41	PCB OR SUBST				2803531
42	INSL OIL				87167416
43	INSL VARNISH				551442
44	FINISHES				1192458
45	SOLVENTS				27128189
46	CREOSOTE				15401007
UNIT					
47	POLES				2653674
48	CROSS ARMS				2612372
CUFT					
49	ARGON				49461342

PROJECTION YEAR 1990 (4)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
PROJECTION (1000S):		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
		2286.613	613.394	41.691	84.683	585.879
LBS.	1 STEEL	205376856	134563865	177608937	35643845	5373316
	2 STNLS STEEL	655190	431780	168875		
	3 ELEC STEEL	333138901	218293482	120666420	36529167	20108559
	4 ALUMINUM	37497026	24571371	32059851	5346577	3585888
	5 COPPER	39210600	25684204	1034359	4457405	
	6 BRASS	708949	462939	42219		
	7 BRONZE	94079	62319	26387		
	8 SILVER	10416	6677	792		
	9 LEAD	207813	136656	98159		
	10 TIN	4536	3116	2111		
	11 ZINC, CD	335995	218115	831		
	12 TUNGSTEN	47039	31159			
	13 ALNICO, BAFE					
	14 NI, NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	65519	69886	84437	12318	690
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	27047586	16692507	978947	1347230	206878
	23 GLASS	3477547	2225668	211094	196311	
	24 ALUMNA, BERYL	839987	569771	139850	21171	3530721
	25 GASKET MATLS	5039923	3115935	303447	192461	52409
	26 PAPER, FIBER	32087509	20031009	17811028	1809137	20688
	27 PHENOLIC RSN	83999	115735	150404	5389	6896
	28 POLYESTER	2889556	1780534	92353	163592	
	29 EPOXY	974385	569771	263867	57738	416515
	30 SILICONE	124318	3116	5805	1925	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	117598	89027	699248	692861	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH, RSLF POLY					
	37 BUTYL RUBBER					1930863
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 FCB OR SUBST			3298339		
	42 INSL OIL	36455442	53861157	11082418		257908
	43 INSL VARNISH	171357	267080	131934	5196	66201
	44 FINISHES	411594	275983	277060	34643	2069
	45 SOLVENTS	525832	344978	197900	36953	2069
	46 CREOSOTE		20254			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	52079203				

PROJECTION YEAR 1990 (4)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		11.800	3742.982	73.627	2505.822	84.737
LBS.	1 STEEL	14659231	1825138	149599639	8341508	1477346
	2 STNLS STEEL	46292	666320	1492087	787281	
	3 ELEC STEEL	15816538	6280793			
	4 ALUMINUM	2263179	3741051	4036454		782931
	5 COPPER	2314615	3721737	18879136	8568196	27428
	6 BRASS	14145	1608826	1231460	940449	11220
	7 BRONZE	5594	48284	537542		
	8 SILVER			59293	104460	
	9 LEAD	9901	77255			1995
	10 TIN		111826			1995
	11 ZINC,CD	3858	30129			
	12 TUNGSTEN			8959		
	13 ALNICO,BAFE		552370			
	14 NI,NI-CR		97	3258		
	15 SI-CARBIDE					
	16 BORIC ACID				206776	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	13888	37855	40723		249
	20 SAND				2603849	
	21 CONCRETE					
	22 PORCELAIN	214316		27202896	19796913	87269
	23 GLASS	54865	7387464	2606265	1470409	
	24 ALUMNA,BERYL	39863		1303133		
	25 GASKET MATLS	59794	289704	667856		
	26 PAPER,FIBER	3034718	1097980	65157	536087	1246705
	27 PHENOLIC KSN		1091220			
	28 POLYESTER	34398	3573	3665061	980273	
	29 EPOXY	46292	309018	162892		
	30 SILICONE	1479		40723		
	31 POLYPRPYLENE					1870058
	32 MSC PLASTICS	77154	159337	293205	76584	28051
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					224407
	42 INSL OIL	1089231				
	43 INSL VARNISH	12087	676			
	44 FINISHES	146592	12940	195470		1496
	45 SOLVENTS	37291	77255	260627		1371
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1990 (4)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		25.396	2346.204	2917.000	60.000	16354.417
LBS.	1 STEEL	16118686	6827794		24000000	5613982
	2 STNLS STEEL	199540				
	3 ELEC STEEL					
	4 ALUMINUM	1567814	272024			3250200
	5 COPPER	3052703	2720			
	6 BRASS	18140	193137			
	7 BRONZE					
	8 SILVER	12309				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	12309				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		14961301			
	16 BORIC ACID					
	17 CU SALTS			354841		
	18 NAF			574007		
	19 ZN PHOSPHATE	2332				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1425286	36723193			11375701
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	194357	1088095			
	26 PAPER,FIBER	349843				
	27 PHENOLIC RSN	45350				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	12309	816071			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14193631		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	291536				
	43 INSL VARNISH					
	44 FINISHES	13994				
	45 SOLVENTS	10366		26091234		
	46 CREOSOTE			15550376		
UNIT	47 POLES			2682179		
	48 CROSS ARMS			2640433		
CUFT	49 ARGON					

PROJECTION YEAR 1990 (4)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		122.825	85.318	14154.288	
LBS.					
1	STEEL	77957873			864988016
2	STNLS STEEL				4447366
3	ELEC STEEL				750833860
4	ALUMINUM	163074889	62962794	3681698	348693747
5	COPPER	32822063	116647973	30374009	286797148
6	BRASS				5231484
7	BRONZE				774204
8	SILVER				193947
9	LEAD		13569857		14101636
10	TIN				123583
11	ZINC,CD	154632			743561
12	TUNGSTEN				99467
13	ALNICO,BAFE				552370
14	NI,NI-CR				3354
15	SI-CARBIDE				14961301
16	BORIC ACID				206776
17	CU SALTS				354841
18	NAF				574007
19	ZN PHOSPHATE				327896
20	SAND				2603849
21	CONCRETE				240000000
22	PORCELAIN				143098722
23	GLASS				17629623
24	ALUMNA,BERYL				6444495
25	GASKET MATLS				11003981
26	PAPER,FIBER	326909	6370651		84787420
27	PHENOLIC RSN				1498993
28	POLYESTER				9609340
29	EPOXY				2800478
30	SILICONE				177365
31	POLYPRPYLENE				1870058
32	MSC PLASTICS				3061445
33	POLYETHYLENE	177045577	107666740		284712317
34	PVC	63073158	86075115		149148273
35	ETPRP RUBBER	43283535	25497365		68780899
36	CH,RSLF POLY	31564503	13438808		45003310
37	BUTYL RUBBER	11366275	5689329		18986468
38	NEOPRENE	4387958	1630311		6018269
39	MISC INSUL	3895700			3895700
40	PENTA				14193631
GAL.					
41	PCB OR SUBST				3522746
42	INSL OIL				103037691
43	INSL VARNISH				654532
44	FINISHES				1371841
45	SOLVENTS				27585876
46	CREOSOTE				15570629
UNIT					
47	POLES				2682179
48	CROSS ARMS				2640433
CUFT					
49	ARGON				52079203

PROJECTION YEAR 1995 (5)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		TRANSFORMERS				
PROJECTION (1000S):		OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE	INSTRUMENT
		2552.989	702.777	52.260	99.407	663.612
LBS.	1 STEEL	229301966	154172342	222634215	41841310	6086234
	2 STNLS STEEL	731515	494698	211686		
	3 ELEC STEEL	371947483	250102932	151256316	42880565	22776514
	4 ALUMINUM	41865193	28151880	40187278	6276196	4061655
	5 COPPER	43778388	29426874	1296577	5232423	
	6 BRASS	791537	530398	52922		
	7 BRONZE	105038	71400	33076		
	8 SILVER	11629	7650	992		
	9 LEAD	232022	156569	123043		
	10 TIN	5064	3570	2646		
	11 ZINC,CD	375136	249899	1042		
	12 TUNGSTEN	52519	35700			
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE					
	16 BORIC ACID					
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	73152	80070	105843	14459	781
	20 SAND					
	21 CONCRETE					
	22 PORCELAIN	30198459	19124918	1227118	1581475	234326
	23 GLASS	3882659	2549989	264608	230443	
	24 ALUMNA,BERYL	937840	652797	175303	24852	3999168
	25 GASKET MATLS	5627042	3569985	380373	225925	59363
	26 PAPER,FIBER	35825501	22949902	22326266	2123695	23433
	27 PHENOLIC RSN	93784	132599	188533	6326	7811
	28 POLYESTER	3226171	2039991	115766	192036	
	29 EPOXY	1087895	652797	330759	67777	471777
	30 SILICONE	138800	3570	7277	2259	
	31 POLYPRPYLENE					
	32 MSC PLASTICS	131298	102000	876513	813330	
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					2187045
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST			4134494		
	42 INSL OIL	40702271	61709737	13891899		292127
	43 INSL VARNISH	191319	305999	165380	6100	74984
	44 FINISHES	459542	316199	347297	40666	2343
	45 SOLVENTS	587088	395248	248070	43378	2343
	46 CREOSOTE		23205			
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON	58146102				

PROJECTION YEAR 1995 (5)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
		12.900	3742.982	87.336	2731.576	100.697
LBS.	1 STEEL	16025769	1825138	177454386	9093009	1755600
	2 STNLS STEEL	50608	666320	1769907	858209	
	3 ELEC STEEL	17290962	6280793			
	4 ALUMINUM	2474154	3741051	4788022		930394
	5 COPPER	2530385	3721737	22394342	9340120	32593
	6 BRASS	15463	1608826	1460753	1025176	13334
	7 BRONZE	6115	48284	637630		
	8 SILVER			70333	113871	
	9 LEAD	10824	77255			2370
	10 TIN		111826			2370
	11 ZINC,CD	4217	30129			
	12 TUNGSTEN			10627		
	13 ALNICO,BAFE		552370			
	14 NI,NI-CR		97	3864		
	15 SI-CARBIDE					
	16 BORIC ACID				225405	
	17 CU SALTS					
	18 NAF					
	19 ZN PHOSPHATE	15182	37855	48305		296
	20 SAND				2838435	
	21 CONCRETE					
	22 PORCELAIN	234295		32267947	21580452	103706
	23 GLASS	59979	7387464	3091540	1602881	
	24 ALUMNA,BERYL	43579		1545770		
	25 GASKET MATLS	65368	289704	792207		
	26 PAPER,FIBER	3317615	1097980	77288	584384	1481519
	27 PHENOLIC RSN		1091220			
	28 POLYESTER	37604	3573	4347478	1068587	
	29 EPOXY	50608	309018	193221		
	30 SILICONE	1617		48305		
	31 POLYPRPYLENE					2222279
	32 MSC PLASTICS	84346	159337	347798	83483	33334
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLF POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA					
GAL.	41 PCB OR SUBST					266673-
	42 INSL OIL	1190769				
	43 INSL VARNISH	13214	676			
	44 FINISHES	160258	12940	231865		1778
	45 SOLVENTS	40767	77255	309154		1630
	46 CREOSOTE					
UNIT	47 POLES					
	48 CROSS ARMS					
CUFT	49 ARGON					

PROJECTION YEAR 1995 (5)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		27.811	2547.208	2938.000	60.000	17893.529
LBS.	1 STEEL	17651471	7412744		24000000	6142313
	2 STNLS STEEL	218515				
	3 ELEC STEEL					
	4 ALUMINUM	1716904	295328			3556076
	5 COPPER	3342996	2953			
	6 BRASS	19865	209683			
	7 BRONZE					
	8 SILVER	13480				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	13480				
	13 ALNICO,SAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		16243066			
	16 BORIC ACID					
	17 CU SALTS			357395		
	18 NAF			578140		
	19 ZN PHOSPHATE	2554				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1560821	39869343			12446267
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	212839	1181314			
	26 PAPER,FIBER	383111				
	27 PHENOLIC RSN	49662				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	13480	885985			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14295814		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	319259				
	43 INSL VARNISH					
	44 FINISHES	15324				
	45 SOLVENTS	11351		26279070		
	46 CREOSOTE			15662326		
UNIT	47 POLES			2701488		
	48 CROSS ARMS			2659442		
CUFT	49 ARGON					

PROJECTION YEAR 1995 (5)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND.	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		128.932	96.138	15927.552	
LBS. 1	STEEL	81834028			997230527
2	STNLS STEEL				5001458
3	ELEC STEEL				862535565
4	ALUMINUM	171183160	70947714	4142945	384317951
5	COPPER	34454014	131441230	34179296	321173928
6	BRASS				5727956
7	BRONZE				901543
8	SILVER				217955
9	LEAD		15290782		15892865
10	TIN				125477
11	ZINC,CD	162321			822745
12	TUNGSTEN				112326
13	ALNICO,BAFE				552370
14	NI,NI-CR				3961
15	SI-CARBIDE				16243066
16	BORIC ACID				225405
17	CU SALTS				357395
18	NAF				578140
19	ZN PHOSPHATE				378497
20	SAND				2838435
21	CONCRETE				240000000
22	PORCELAIN				160429128
23	GLASS				19069564
24	ALUMNA,BERYL				7379309
25	GASKET MATLS				12404121
26	PAPER,FIBER	343163	7178574		97712432
27	PHENOLIC RSN				1569936
28	POLYESTER				11031207
29	EPOXY				3163853
30	SILICONE				201828
31	POLYPRPYLENE				2222279
32	MSC PLASTICS				3530904
33	POLYETHYLENE	185848486	121320999		307169486
34	PVC	66209228	96991132		163200360
35	ETPRP RUBBER	45435642	28730932		74166574
36	CH,KSLF POLY	33133926	15143113		48277039
37	BUTYL RUBBER	11931420	6410848		20529313
38	NEOPRENE	4606133	1837066		6443199
39	MISC INSUL	4089399			4089399
40	PENTA				14295814
GAL. 41	PCB OR SUBST				4401167
42	INSL OIL				118106061
43	INSL VARNISH				757672
44	FINISHES				1588213
45	SOLVENTS				27995354
46	CREOSOTE				15685530
UNIT 47	POLES				2701488
48	CROSS ARMS				2659442
CUFT 49	ARGON				58146102

PROJECTION YEAR 2000 (6)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

			TRANSFORMERS			
			OVERHEAD	UNDERGROUND	SMALL POWER	DRY TYPE INSTRUMENT
PROJECTION (1000S):			2195.641	808.539	60.471	113.842 739.958
LBS.	1	STEEL	197206019	177373977	257614115	47917133 6786432
	2	STNLS STEEL	629123	569146	244946	
	3	ELEC STEEL	319885101	287741310	175021445	49107299 25396864
	4	ALUMINUM	36005222	32388500	46501434	7187570 4528933
	5	COPPER	37650622	33855370	1500293	5992229
	6	BRASS	680744	610218	61236	
	7	BRONZE	90336	82145	38273	
	8	SILVER	10001	8801	1148	
	9	LEAD	199545	180132	142375	
	10	TIN	4355	4107	3062	
	11	ZINC,CD	322627	287507	1206	
	12	TUNGSTEN	45168	41072		
	13	ALNICO,BAFE				
	14	NI,NI-CR				
	15	SI-CARBIDE				
	16	BORIC ACID				
	17	CJ SALTS				
	18	NAF				
	19	ZN PHOSPHATE	62912	92119	122473	16559 871
	20	SAND				
	21	CONCRETE				
	22	PORCELAIN	25971508	22003057	1419920	1811123 261285
	23	GLASS	3339194	2933741	306182	263906
	24	ALUMNA,BERYL	806569	751038	202846	28461 4459257
	25	GASKET MATLS	4839412	4107237	440137	258732 66192
	26	PAPER,FIBER	30810920	26403668	25834130	2432079 26128
	27	PHENOLIC RSN	80657	152555	218155	7244 8709
	28	POLYESTER	2774596	2346993	133955	219922
	29	EPOXY	935620	751038	382728	77620 526053
	30	SILICONE	119372	4107	8420	2587
	31	POLYPRPYLENE				
	32	MSC PLASTICS	112920	117350	1014229	931435
	33	POLYETHYLENE				
	34	PVC				
	35	ETPRP RUBBER				
	36	CH,RSLE POLY				
	37	BUTYL RUBBER				2438656
	38	NEOPRENE				
	39	MISC INSUL				
	40	PENTA				
GAL.	41	PCB OR SUBST			4784098	
	42	INSL OIL	35005077	70996530	16074570	325735
	43	INSL VARNISH	164540	352049	191364	6986 83611
	44	FINISHES	395219	363784	401864	46572 2613
	45	SOLVENTS	504912	454730	287046	49677 2613
	46	CREOSOTE		26697		
UNIT	47	POLES				
	48	CROSS ARMS				
CUFT	49	ARGON	50007252			

PROJECTION YEAR 2000 (6)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):			VOLTAGE REG	METERS	SWITCHGEAR	FUSES	CAPACITORS
			14.000	3742.982	98.516	2428.723	83.654
LBS.	1	STEEL	17392308	1825138	200170563	8084857	1458464
	2	STNLS STEEL	54923	666320	1996475	763058	
	3	ELEC STEEL	18765385	6280793			
	4	ALUMINUM	2685128	3741051	5400944		772924
	5	COPPER	2746154	3721737	25261072	8304570	27077
	6	BRASS	16782	1608826	1647745	911513	11077
	7	BRONZE	6637	48284	719254		
	8	SILVER			79336	101246	
	9	LEAD	11747	77255			1969
	10	TIN		111826			1969
	11	ZINC, CD	4577	30129			
	12	TUNGSTEN			11988		
	13	ALNICO, BAFE		552370			
	14	NI, NI-CR		97	4359		
	15	SI-CARBIDE					
	16	BORIC ACID				200414	
	17	CU SALTS					
	18	NAF					
	19	ZN PHOSPHATE	16477	37855	54489		246
	20	SAND				2523734	
	21	CONCRETE					
	22	PORCELAIN	254274		36398611	19187802	86154
	23	GLASS	65094	7387464	3487292	1425168	
	24	ALUMINA, BERYL	47295		1743646		
	25	GASKET MATLS	70942	289704	893619		
	26	PAPER, FIBER	3600513	1097980	87182	519592	1230771
	27	PHENOLIC RSN		1091220			
	28	POLYESTER	40811	3573	4904004	950112	
	29	EPOXY	54923	309018	217956		
	30	SILICONE	1754		54489		
	31	POLYPRPYLENE					1846157
	32	MSC PLASTICS	91538	159337	392320	74227	27692
	33	POLYETHYLENE					
	34	PVC					
	35	ETPRP RUBBER					
	36	CH, RSLF POLY					
	37	BUTYL RUBBER					
	38	NEOPRENE					
	39	MISC INSUL					
	40	PENTA					
GAL.	41	PCB OR SUBST					221539
	42	INSL OIL	1292308				
	43	INSL VARNISH	14341	676			
	44	FINISHES	173923	12940	261547		1477
	45	SOLVENTS	44244	77255	348729		1354
	46	CREOSOTE					
UNIT	47	POLES					
	48	CROSS ARMS					
CUFT	49	ARGON					

PROJECTION YEAR 2000 (6)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

PROJECTION (1000S):		BREAKERS	ARRESTERS	WOOD POLES	CONCR POLES	INSULATORS
		29.840	2405.062	2943.000	60.000	15828.784
LBS.	1 STEEL	18939265	6999079		24000000	5433548
	2 STNLS STEEL	234457				
	3 ELEC STEEL					
	4 ALUMINUM	1842163	278848			3145738
	5 COPPER	3586890	2788			
	6 BRASS	21314	197982			
	7 BRONZE					
	8 SILVER	14463				
	9 LEAD					
	10 TIN					
	11 ZINC,CD					
	12 TUNGSTEN	14463				
	13 ALNICO,BAFE					
	14 NI,NI-CR					
	15 SI-CARBIDE		15336627			
	16 BORIC ACID					
	17 CU SALTS			358004		
	18 NAF			579123		
	19 ZN PHOSPHATE	2740				
	20 SAND					
	21 CONCRETE				240000000	
	22 PORCELAIN	1674694	37644449			11010085
	23 GLASS					
	24 ALUMNA,BERYL					
	25 GASKET MATLS	228367	1115391			
	26 PAPER,FIBER	411061				
	27 PHENOLIC RSN	53286				
	28 POLYESTER					
	29 EPOXY					
	30 SILICONE					
	31 POLYPRPYLENE					
	32 MSC PLASTICS	14463	836543			
	33 POLYETHYLENE					
	34 PVC					
	35 ETPRP RUBBER					
	36 CH,RSLE POLY					
	37 BUTYL RUBBER					
	38 NEOPRENE					
	39 MISC INSUL					
	40 PENTA			14320143		
GAL.	41 PCB OR SUBST					
	42 INSL OIL	342551				
	43 INSL VARNISH					
	44 FINISHES	16442				
	45 SOLVENTS	12180				
	46 CREOSOTE			26323792		
UNIT	47 POLES			15688980		
	48 CROSS ARMS			2706086		
CUFT	49 ARGON			2663968		

PROJECTION YEAR 2000 (6)

HIGH ELECTRICAL DEMAND CASE
(USING 1975 TECHNOLOGY)

		OH COND.	UG CABLE	CONNECTORS	TOTAL
PROJECTION (1000S):		121.655	108.941	14673.533	
LBS. 1	STEEL	77215266			1048416163
2	STNLS STEEL				5158449
3	ELEC STEEL				882198196
4	ALUMINUM	161521479	80396045	3816760	390212738
5	COPPER	32509409	148945672	31488268	335592151
6	BRASS				5767438
7	BRONZE				984928
8	SILVER				214996
9	LEAD		17327104		17940127
10	TIN				125320
11	ZINC,CD	153160			799205
12	TUNGSTEN				112691
13	ALNICO,BAFE				552370
14	NI,NI-CR				4456
15	SI-CARBIDE				15336627
16	BORIC ACID				200414
17	CU SALTS				358004
18	NAF				579123
19	ZN PHOSPHATE				406742
20	SAND				2523734
21	CONCRETE				240000000
22	PORCELAIN				157722961
23	GLASS				19208042
24	ALUMNA,BERYL				8039111
25	GASKET MATLS				12309734
26	PAPER,FIBER	323795	8134568		100912389
27	PHENOLIC KSN				1611826
28	POLYESTER				11373965
29	EPOXY				3254955
30	SILICONE				190730
31	POLYPRPYLENE				1846157
32	MSC PLASTICS				3772055
33	POLYETHYLENE	175359085	137477699		312836784
34	PVC	62472339	109907746		172380086
35	ETPRP RUBBER	42871227	32557120		75428347
36	CH,RSLE POLY	31263827	17159769		48423596
37	BUTYL RUBBER	11258003	7264601		20961261
38	NEOPRENE	4346160	2081714		6427874
39	MISC INSUL	3858591			3858591
40	PENTA				14320143
GAL. 41	PCB OR SUBST				5005637
42	INSL OIL				124036770
43	INSL VARNISH				813567
44	FINISHES				1676381
45	SOLVENTS				28106530
46	CREOSOTE				15715677
UNIT 47	POLES				2706086
48	CROSS ARMS				2663968
CUFT 49	ARGON				50007252

APPENDIX 5

AVAILABILITY OF RAW MATERIAL INPUTS

I N D E X

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ALUMINUM	1
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ALUMINUM - U. S. CONSUMPTION

(Thousand Short Tons)

<u>Year</u>	<u>Primary Metal Consumption</u>	<u>Aluminum Consumption</u>	<u>Industrial Demand for Aluminum*</u>
1954	1,675	1,967	
1955	1,775	2,111	
1956	1,788	2,127	
1957	1,775	2,137	
1958	1,803	2,092	
1959	2,129	2,488	
1960	1,686	2,016	
1961	1,980	2,320	
1962	2,309	2,770	
1963	2,535	3,040	
1964	2,679	3,216	3,050
1965	3,093	3,734	3,480
1966	3,308	4,002	4,090
1967	3,310	4,009	3,031
1968	3,847	4,663	4,375
1969	3,810	4,710	4,528
1970	3,737	4,519	4,268
1971	4,284	5,099	4,793
1972	4,644	5,588	5,565
1973	4,647	5,685	6,507

Sources: U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

ALUMINUM - U. S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Metal							
Construction	344, 379, 245	958	988	943	1,193	1,461	1,543
Transportation	37	842	826	647	767	1,017	1,206
Cans and containers	341, 349, 335	437	497	615	648	539	884
Electrical	36, 3441	559	593	570	609	701	798
Appliances and equipment	25, 33, 35, 36	420	442	391	417	514	575
Machinery	35	289	292	254	276	342	406
Other		468	447	332	311	377	371
TOTAL		3,973	4,085	3,752	4,221	4,951	5,783
Nonmetal (bauxite and alumina)							
Abrasives	3291	69	76	82	73	93	123
Refractories	3297	121	134	136	141	174	245
Chemicals	281	212	233	298	358	347	356
TOTAL		402	443	516	572	614	724
TOTAL		4,375	4,528	4,268	4,793	5,565	6,507

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

ALUMINUM - U.S. SUPPLY

(Thousand Short Tons)

<u>Year</u>	<u>Domestic Primary Production</u>	<u>% of Total Supply</u>	<u>Old Scrap</u>	<u>%</u>	<u>Total Scrap</u>	<u>Imports for¹ Consumption</u>	<u>%</u>	<u>Net Imports¹</u>	<u>%</u>	<u>Total² Supply</u>
1954	1,461	85.1	60.0	3.5	292.0	244	14.2	196	11.4	1717.0
1955	1,566	84.9	76.4	4.1	336.0	240	13.0	203	11.0	1845.4
1956	1,679	86.3	71.7	3.7	339.8	265	13.6	196	10.0	1946.7
1957	1,648	86.0	72.5	3.8	361.9	258	13.5	196	10.2	1916.5
1958	1,566	85.0	64.1	3.5	289.5	293	15.9	212	11.5	1842.1
1959	1,954	90.0	78.0	3.6	359.9	302	13.9	140	6.6	2172.0
1960	2,014	106.2	62.7	3.3	229.5	196	10.3	(-180)	(-9.5)	1896.7
1961	1,904	93.8	102.1	5.0	340.2	255	12.6	24	1.2	2030.1
1962	2,118	89.4	128.5	5.4	461.7	377	15.9	124	5.2	2370.5
1963	2,313	88.6	115.9	4.4	505.6	466	17.9	181	6.9	2609.9
1964	2,553	91.6	123.7	4.4	551.7	453	16.3	110	4.0	2786.7
1965	2,754	85.5	159.7	5.0	640.7	620	19.3	307	9.5	3220.7
1966	2,968	85.9	136.9	4.0	693.1	679	19.7	349	10.1	3453.9
1967	3,269	91.6	128.5	3.6	697.8	539	15.1	173	4.8	3570.5
1968	3,255	84.5	154.7	4.0	816.9	793	20.6	442	11.5	3851.7
1969	3,793	96.7	148.2	3.8	900.8	558	14.2	(-17)	(-.5)	3924.2
1970	3,976	100.0	145.6	3.7	781.4	468	11.8	(-144)	(-3.7)	3977.6
1971	3,925	87.4	167.0	3.7	815.1	690	15.4	397	(8.9)	4489.0
1972	4,122	86.3	188.6	4.0	944.4	794	16.6	465	(9.7)	4775.6
1973	4,529	94.8	195.5	4.1	1038.5	614	12.9	53	(1.1)	4777.5

¹Imports of crude and semicrude aluminum only.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

ALUMINUM (CRUDE AND SEMICRUDE) - MAJOR U.S. IMPORT SOURCES
(Short Tons)

<u>C o u n t r y</u>	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
	<u>Amount</u>	<u>% of Total U.S. Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	363,197	77.7	481,855	69.9	558,295	70.3	475,049	77.4
Norway	21,145	4.5	57,569	8.4	64,227	8.1	14,584	2.4
Ghana	--	--	35,132	5.1	40,746	5.1	40,882	6.7
Belgium-Luxembourg	27,746	5.9	26,089	3.8	35,330	4.5	21,726	3.5
United Kingdom	3,941	.8	14,960	2.2	28,740	3.6	9,607	1.6
France	14,352	3.1	17,791	2.1	31,445	4.0	10,708	1.8
TOTAL IMPORTS	467,733		689,837		794,485		613,606	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

BAUXITE AND ALUMINA - MAJOR U.S. IMPORT SOURCES
(Thousand Short Tons - Aluminum Metal Content¹)

<u>C o u n t r y</u>	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Jamaica	1385.9	47.3	1176.9	41.8	1243.8	42.7	1245.1	39.3
Surinam	542.4	18.5	597.8	21.2	611.1	21.0	535.4	16.9
Australia	592.5	20.2	637.4	22.6	619.9	21.3	1014.4	32.0
Dominican Republic	113.8	3.9	114.0	4.0	106.4	3.7	114.5	3.6
Guyana	118.4	4.0	102.2	3.6	115.3	4.0	138.6	4.4
TOTAL IMPORTS	2931.0		2818.8		2915.3		3166.0	

¹Assumes it takes 8 long tons of crude bauxite to make 1 short ton of aluminum; 4 long tons of calcinated bauxite to make 1 short ton of aluminum; 2 short tons of alumina to make 1 short ton of bauxite.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

ALUMINUM (CRUDE AND SEMICRUDE) - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970 - 1973)

<u>C o u n t r y</u>	<u>% of World Primary Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>
Canada	8.9	44.3	8.9
Norway	5.2	6.4	.8
Ghana	.1	26.0	.6
Belgium-Luxembourg	--	--	.5
United Kingdom	1.4	8.2	.3
France	3.5	4.4	.4
(U.S.)	(34.9)		(78.3)
Total Net Imports (Bauxite, Alumina, Crude, and Semicrude)			68.1

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

BAUXITE - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970 - 1973)

<u>C o u n t r y</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Reserves *</u>
Jamaica	19.9	81.2	23.9	6.5
Surinam	10.7	68.3	10.8	3.3
Australia	21.3	42.9	13.6	32.3
Dominican Republic	1.7	84.1	2.1	--
Guyana	5.9	25.8	2.3	1.0
(U.S.)	(3.1)		(5.4)	.3

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

U.S. Bureau of Mines, Commodity Data Summaries, 1975.

BAUXITE - RESERVES AND RESOURCES

Domestic

Reserves¹ - 40,000,000 long tons

Resources - $250-300 \times 10^6$ long tons

Foreign

Reserves² - 15.5×10^9 long tons

Resources - $25-30 \times 10^9$ long tons

In addition, both the U.S. and the world have virtually inexhaustible hypothetical resources of aluminum in materials other than bauxite.

¹At 1973 primary consumption levels this is a forward reserve of 1.1 years (assuming 8 long tons of bauxite produce 1 short ton of aluminum).

²At 1972 production levels this is a forward reserve of 230.2 years (assuming 8 long tons of bauxite produce 1 short ton of aluminum).

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975.

ALUMINUM - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Consumption</u>	<u>Production</u>
1960	2,875	2,999
1961	2,519	3,151
1962	3,163	3,387
1963	3,335	3,665
1964	3,766	4,109
1965	4,064	4,386
1966	4,485	4,798
1967	4,692	5,252
1968	5,365	5,822
1969	6,153	6,322
1970	6,812	7,039
1971	7,035	7,937
1972	7,720	8,418

Source: Yearbook of the American Bureau of Metal Statistics

ARGON - U. S. CONSUMPTION AND PRODUCTION*
(million cubic feet)

<u>Year</u>	<u>Consumption and Production</u>
1964	1044.5
1965	1276.6
1966	1702.1
1967	1914.9
1968	2108.3
1969	2591.8
1970	2746.6
1971	3017.4
1972	3810.4
1973	4390.6

* Argon is not consumed in any of its uses, and returns to the atmosphere after use. Thus, United States and world resources are unlimited.

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

ARGON - U. S. CONSUMPTION BY MAJOR END-USE CATEGORY

(million cubic feet)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Fabricated metal products	34	1586.0	1934.2	2069.6	2263.0	2843.3	3268.8
Iron and steel production	331	96.7	116.1	116.1	135.4	174.1	193.4
Nonferrous metal production	333	96.7	116.1	116.1	135.4	174.1	193.4
Chemicals	2819	116.1	154.7	174.1	174.1	232.1	270.8
Electronic components	367	38.7	58.0	58.0	58.0	77.4	96.7
Other		<u>174.1</u>	<u>212.8</u>	<u>212.8</u>	<u>251.5</u>	<u>309.5</u>	<u>367.5</u>
TOTAL		2108.3	2591.8	2746.6	3017.4	3810.4	4390.6

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

ASBESTOS - U.S. PRODUCTION AND CONSUMPTION
(Short Tons)

Year	Mine Production	%	Imports	%	Exports	Net Imports	%	Total Supply/ Apparent Consumption
1950	42,434	5.8	705,458	97.0	20,890	684,568	94.2	727,002
1951	51,645	6.5	761,873	95.6	16,526	745,347	93.5	796,692
1952	53,864	7.2	708,419	94.3	10,724	697,695	92.8	752,559
1953	54,456	7.3	692,245	93.1	3,076	689,169	92.7	743,625
1954	47,621	6.6	678,390	93.7	1,894	676,496	93.4	724,117
1955	44,580	5.7	740,423	94.7	2,787	737,636	94.3	782,216
1956	41,312	5.7	689,034	94.7	2,950	686,084	94.3	727,396
1957	43,653	6.0	682,732	94.4	2,893	679,839	94.0	723,492
1958	43,979	6.4	644,331	94.0	3,026	641,305	93.6	685,284
1959	45,459	6.0	713,047	94.6	4,461	708,586	94.0	754,045
1960	45,223	6.4	669,495	94.4	5,526	663,969	93.6	709,193
1961	52,814	7.9	616,529	92.6	3,799	612,730	92.1	665,544
1962	53,190	7.3	676,027	93.1	2,949	673,078	92.7	726,268
1963	66,606	9.2	667,860	92.2	10,044	657,816	90.8	724,422
1964	101,092	12.4	739,361	90.9	27,147	712,214	87.6	813,306
1965	118,275	14.9	719,559	90.6	43,126	676,433	85.1	794,408
1966	125,928	15.6	726,459	90.2	46,996	679,463	84.4	805,391
1967	123,189	17.1	645,112	89.5	47,718	597,394	82.9	720,583
1968	120,690	14.8	737,909	90.3	41,236	696,673	85.2	817,363
1969	125,936	16.1	694,558	88.6	36,173	658,385	83.9	784,321
1970	125,314	17.2	649,402	89.2	46,585	602,817	82.8	728,131
1971	130,882	17.3	681,367	89.8	53,678	627,689	82.7	758,571
1972	131,663	16.3	735,515	91.0	58,624	676,891	83.7	808,554
1973	150,036	17.1	792,473	90.5	66,442	726,031	82.9	876,067
1974	113,000 ^x	12.9	776,000 ^x	88.8	40,000 ^x	736,000	87.1	874,000 ^x

Sources: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

ASBESTOS - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Flooring products-----	3292	204	196	183	190	202	218
Asbestos cement pipe-----	3292	155	149	139	144	154	166
Roofing products-----	3292	82	79	73	76	81	87
Friction products-----	3292	74	71	66	68	73	79
Asbestos cement sheet-----	3292	57	55	51	53	57	64
Packing and gaskets-----	3293	25	24	22	23	24	26
Insulation-----	3292	25	24	22	23	24	26
Paper products-----	2661	16	16	15	15	16	18
Textiles-----	3292	16	16	15	15	16	18
Other-----		<u>163</u>	<u>155</u>	<u>146</u>	<u>151</u>	<u>162</u>	<u>174</u>
TOTAL		817	785	732	758	809	876

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

ASBESTOS - U.S. IMPORT SOURCES
(Short Tons)

<u>Country</u>	<u>1970 Amount</u>	<u>% of U.S. Total Imports</u>	<u>1971 Amount</u>	<u>%</u>	<u>1972 Amount</u>	<u>%</u>	<u>1973 Amount</u>	<u>%</u>
Canada	613,310	94.4	648,642	95.2	713,895	97.1	764,644	96.5
Republic of South Africa	26,728	4.1	25,011	3.7	16,385	2.2	25,064	3.2

Source: U.S. Bureau of Mines, Minerals Yearbooks, 1969-1973

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ASBESTOS - U.S. MAJOR IMPORT SOURCE INFORMATION
(1970-1973)

<u>Country</u>	<u>% of World Mine Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Reserves^x</u>
Canada	43.5	39.4	49.4	42.7
Republic of South Africa	8.8	6.7	1.7	6.3

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1969-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

ASBESTOS - RESERVE AND RESOURCES
(Thousand Short Tons)

DOMESTIC

Recoverable Identified Resources (Reserves) ¹	- 4,000	} used for planning purposes
Hypothetical Resources	- 3,000	

FOREIGN

Recoverable Identified Resources ²	- 92,000	} used for planning purposes
Hypothetical Resources	- 50,000	

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹At 1974 consumption levels, this is a forward reserve of 4.6 years.

²At 1974 production levels, this is a forward reserve of 20.7 years.

ASBESTOS - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1950	1,383	
1951	1,518	
1952	1,506	
1953	1,510	
1954	1,622	
1955	1,905	
1956	1,949	
1957	2,035	
1958	2,011	
1959	2,215	
1960	2,395	
1961	2,275	
1962	2,602	
1963	2,694	
1964	2,950	
1965	2,983	
1966	3,149	
1967	3,084	
1968	3,195	2,686 ^{xx}
1969	3,473	
1970	3,726	
1971	3,821	
1972	3,952	
1973	4,456	
1974	4,454 ^x	

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-73

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

^{xx}Estimated by the Bureau of Mines in U.S. Bureau of Mines, Mineral Facts and Problems, 1970

BARITE - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Consumption</u>
1950	786
1951	951
1952	1,034
1953	1,150
1954	1,216
1955	1,460
1956	2,035
1957	1,671
1958	1,196
1959	1,396
1960	1,190
1961	1,391
1962	1,211
1963	1,230
1964	1,277
1965	1,388
1966	1,417
1967	1,371
1968	1,378 ^x
1969	1,605 ^x
1970	1,409 ^x
1971	1,355 ^x
1972	1,478 ^x
1973	1,592 ^x

Source: U.S. Bureau of Mines, Minerals Yearbook,
1950-1973

^xGround and crushed barite sold by producers
(including imports)

BARITE - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Oil and gas industries (drilling muds)	1311,1381	1,007	1,236	1,117	1,045	1,182	1,325
Industrial chemicals	2819	175	177	146	139	105	109
Paints, plastics, and rubber	282,2851	102	66	64	57	89	98
Ceramics and glass	322	71	73	50	63	63	32
Other		21	54	31	52	38	28
TOTAL		1,376	1,606	1,408	1,356	1,477	1,592

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

BARITE - U.S. SUPPLY
(Thousand Short Tons)

Year	Production	% of Total Supply	Imports	%	Net Imports	%	Total Supply
1950	693	92.3	58	7.7	58	7.7	751
1951	846	94.1	53	5.9	53	5.9	899
1952	1,013	90.4	108	9.6	108	9.6	1,121
1953	920	73.3	335	26.7	335	26.7	1,255
1954	926	74.5	317	25.5	317	25.5	1,243
1955	1,114	75.6	360	24.4	360	24.4	1,474
1956	1,352	69.7	589	30.3	589	30.3	1,941
1957	1,305	61.0	833	39.0	833	39.0	2,138
1958	486	48.0	527	52.0	527	52.0	1,013
1959	867	57.5	640	42.5	640	42.5	1,507
1960	771	54.6	642	45.4	642	45.4	1,413
1961	731	54.6	608	45.4	608	45.4	1,339
1962	887	54.6	737	45.4	738	45.4	1,624
1963	803	58.1	578	41.9	578	41.9	1,381
1964	818	57.7	600	42.3	600	42.3	1,418
1965	846	54.3	712	45.7	712	45.7	1,558
1966	1,007	59.0	699	41.0	699	41.0	1,706
1967	945	64.0	532	36.0	532	36.0	1,477
1968	927	58.3	663	41.7	663	41.7	1,590
1969	1,077	63.7	614	36.3	614	36.3	1,691
1970	854	57.1	706	48.1	643	42.9	1,497
1971	825	64.2	484	37.7	460	35.8	1,285
1972	906	61.3	624	42.2	572	38.7	1,478
1973	1,104	63.0	716	40.9	648	37.0	1,752

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

BARITE - MAJOR U.S. IMPORT SOURCES
(Thousand Short Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Peru	170	24.1	111	22.9	186	29.8	201	28.1
Ireland	203	28.8	107	22.1	154	24.7	227	31.7
Mexico	132	18.7	99	20.5	140	22.4	142	19.8
Greece	56	7.9	50	10.3	67	10.7	51	7.1
Canada	88	12.5	71	14.7	20	3.2	50	7.0
TOTAL IMPORTS	706		484		624		716	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

BARITE - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves*
Peru	4.8	79.8	11.5	2.0
Ireland	5.7	70.0	11.9	3.0
Mexico	7.0	41.7	8.8	2.0
Greece	2.2	58.2	3.8	2.0
Canada	2.5	51.7	3.9	2.0
(United States)	(21.0)			(32.5)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

*U.S. Bureau of Mines, Commodity Data Summaries, 1975

BARITE - RESERVES AND RESOURCES

DOMESTIC

Reserves ^{1,x}	65,000,000 short tons
Identified Resources	99,000,000 short tons
Hypothetical Resources	152,000,000 short tons
Speculative Resources	275,000,000 short tons

FOREIGN

Reserves ^{2,x}	135,000,000 short tons
Identified Resources	242,000,000 short tons
Hypothetical Resources	288,000,000 short tons
Speculative Resources	1,132,000,000 short tons

Sources: U.S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

¹At 1973 consumption levels this is a forward reserve of 40.8 years

²At 1973 production levels this is a forward reserve of 36.9 years

BARITE - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1950	907	
1951	1,134	
1952	987	
1953	1,380	
1954	1,374	
1955	1,584	
1956	1,748	
1957	2,195	
1958	2,324	
1959	2,133	
1960	2,279	
1961	2,409	
1962	2,543	
1963	2,415	
1964	2,671	
1965	3,053	
1966	3,061	
1967	2,989	
1968	2,842	2,500 ^x
1969	3,161	
1970	3,484	
1971	3,289	
1972	3,456	
1973	3,657	

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Mineral Facts and Problems, 1970

BERYL - U. S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Consumption</u>	<u>Consumption of Beryllium*</u>
1964	4,435	251
1965	5,845	311
1966	6,026	350
1967	7,087	360
1968	9,244	353
1969	8,483	469
1970	9,496	380
1971	10,373	415
1972	7,781	311
1973	8,695	348

Sources: U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

* U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

BERYLIUM - U. S. CONSUMPTION BY MAJOR END-USE CATEGORY

<u>E n d U s e</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Nuclear reactors	4911	38	55	40	50	70	90
Aerospace vehicles	3721, 3761	38	55	30	55	76	75
Electrical:	36						
Electrical measuring instruments		49	55	55	55	25	30
Switchgear		99	120	90	90	45	50
Welding apparatus		44	53	55	55	20	20
TOTAL		192	228	200	200	90	100
Electronic components	367						
Computer equipment		15	58	50	50	25	28
Radio and TV		27	36	30	30	15	17
TOTAL		42	94	80	80	40	45
Other		43	37	30	30	35	38
TOTALS		353	469	380	415	311	348

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

BERYL - U. S. SUPPLY

(Short Tons)

Year	B E R Y L *				Berylium or Berylium Equivalence **					
	Mine Production	% of Consumption	Imports	%	Mine Production	% of Consumption	Imports	%	Net Imports	%
1964			5,425	122.3			222	88.5	137	54.6
1965	N.A.		7,791	133.3			317	101.9	257	82.6
1966			2,147	36.1			91	26.0	60	17.1
1967			9,511	134.2			387	107.5	349	96.9
1968	168	1.8	3,822	41.4	N.A.	N.A.	160	45.3	113	32.0
1969			6,422	75.7			259	55.2	244	52.0
1970			4,942	52.0			201	52.9	181	47.6
1971	N.A.		4,026	38.8			161	38.8	140	33.7
1972			3,345	43.0			134	43.1	86	27.7
1973			1,586	18.2			68	19.5	13	3.7

Sources: * U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

** U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

BERYL - MAJOR U. S. IMPORT SOURCES

<u>C o u n t r y</u>	1 9 7 0		(Short Tons) 1 9 7 1		1 9 7 2		1 9 7 3	
	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Brazil	3,586	72.6	2,365	58.7	1,755	52.5	862	54.4
Republic of South Africa	294	6.0	593	14.7	820	24.5	300	18.9
Argentina	275	5.6	248	6.2	248	7.4	138	8.7
Australia	61	1.2	84	2.1	97	2.9	116	7.3
Rwanda	50	1.0	120	3.0	98	2.9	67	4.2
TOTAL U. S. IMPORTS	4,942		4,026		3,345		1,586	

Source: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

BERYL - MAJOR U. S. IMPORT SOURCE INFORMATION

(1970 - 1973)

<u>C o u n t r y</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U. S.</u>	<u>% of U. S. Demand Supplied</u>	<u>% of World Reserves</u>
Brazil	45.4	87.5	23.6	
Republic of South Africa	5.8	161.6	5.5	
Argentina	4.2	133.0	2.5	
Australia	1.1	150.4	1.0	N.A.
Rwanda	3.7	42.5	1.0	
(U. S. S. R.)	27.4	-	-	

Source: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

BERYL - RESERVES AND RESOURCES

D o m e s t i c

Reserves¹ > 28,000 short tons

Resources Estimated at around 80,000 tons of contained metal. Hypothetical resources are estimated to be very large.

F o r e i g n

Reserves }
Resources } Not known

Source: U. S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973.

BERYL - FOREIGN PRODUCTION
(Short Tons)

<u>Year</u>	<u>Mine Production</u>
1964	4,916
1965	6,123
1966	4,549
1967	5,442
1968	7,078
1969	8,869
1970	6,857
1971	5,791
1972	4,634
1973	4,291

Source: U. S. Bureau of Mines, Minerals Yearbook,
1950-1973.

BORON - U.S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Industrial Demand</u>
1964	69,000
1965	74,300
1966	77,000
1967	84,449
1968	87,000
1969	85,864
1970	88,181
1971	87,500
1972	93,000
1973	141,000

Source: U.S. Bureau of Mines, Minerals
in the U.S. Economy, 1975

BORON - U.S. CONSUMPTION BY MAJOR END USE CATEGORY
(Short Tons)

End Use	SIC Code	1968	1969	1970	1971	1972	1973
Ceramics and glass	3229	29,200	29,194	30,000	35,000	40,000	50,000
Coating & plating (enamel)	3479	11,900	12,021	12,300	8,800	9,000	11,000
Agriculture	2879	11,900	12,021	12,300	8,700	7,000	8,000
Soaps and detergents	284	13,600	13,738	14,000	13,000	4,000	17,000
Fabricated metal products (fluxes)	2899	1,700	1,717	2,000	2,000	2,000	3,000
Other		18,700	17,173	17,581	20,000	21,000	25,000
TOTAL		87,000	85,864	88,181	87,500	93,000	114,000

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

BORON - U.S. SUPPLY
(Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	125,955	182.6	4,000	5.8	(-57,000)	(-82.6)	68,955
1965	132,175	177.9	5,000	6.7	(-57,875)	(-77.4)	74,300
1966	143,682	187.3	4,000	5.2	(-66,982)	(-87.3)	76,700
1967	147,103	174.2	4,352	5.2	(-62,654)	(-74.2)	84,449
1968	161,409	185.1	2,932	3.4	(-74,209)	(-85.1)	87,200
1969	171,361	198.9	3,675	4.3	(-85,197)	(-98.9)	86,164
1970	175,000	197.3	3,681	4.2	(-86,319)	(-97.3)	88,681
1971	176,500	201.7	1,000	1.1	(-89,000)	(-100.7)	87,500
1972	189,000	183.5	2,000	1.9	(-86,000)	(-83.5)	103,000
1973	207,000	181.6	2,000	1.8	(-93,000)	(-81.6)	114,000

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

BORON - MAJOR U.S. IMPORT SOURCE INFORMATION
(1973)

Country	U.S. Imports (Short Tons)	% of Total Imports	% of World Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves ^x
Turkey	2,000	100	23.4	2.5	1.8	26.0
U.S.S.R.	-	-	11.7	-	-	19.5
Argentina	-	-	2.9	-	-	3.9
People's Rep. of China	-	-	1.5	-	-	N.A.
(U.S.)	-	-	(60.5)	-	-	(42.9)

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

BORON - RESERVES AND RESOURCES

DOMESTIC

Reserves ¹	66-132,000,000 short tons
Resources	Large

FOREIGN

Reserves ²	124-154,000,000 short tons
Resources	Large, especially in Turkey where current surveys could expand reserves of 200,000,000 short tons by a factor of more than 3.

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹At 1973 consumption levels this is a forward reserve of 468.1 - 936.2 years

²At 1973 production levels this is a forward reserve of 918.5 - 1,140.7 years

BORON - FOREIGN PRODUCTION AND CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Mine Production</u>
1964	45,900
1965	57,100
1966	65,400
1967	73,500
1968	70,300
1969	79,741
1970	82,400
1971	109,200
1972	125,000
1973	135,000

Source: U.S. Bureau of Mines, Minerals in
the U.S. Economy, 1975

CADMIUM - U.S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Apparent Consumption</u>	<u>Industrial Consumption</u> ^x
1950	3,864	
1951	3,586	
1952	4,504	
1953	4,785	
1954	3,750	
1955	5,342	
1956	6,356	
1957	5,483	
1958	4,105	
1959	5,795	
1960	5,063	
1961	5,092	
1962	6,073	
1963	5,741	
1964	4,682	4,334
1965	5,216	5,164
1966	7,390	7,212
1967	5,789	5,545
1968	6,664	6,446
1969	7,531	7,163
1970	4,531	4,533
1971	5,436	5,417
1972	6,313	6,307
1973	6,228	6,228

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Minerals in the U.S. Economy,
1975

CADMIUM - U.S. CONSUMPTION BY MAJOR END USE CATEGORY
(Short Tons)

End Use	SIC Code	1968	1969	1970	1971	1972	1973
Transportation	37	990	1,100	885	1,058	1,250	1,250
Coating and plating	3471	2,925	3,263	1,380	1,650	1,900	1,745
Batteries	3692	200	250	150	180	450	620
Paints	2851	675	725	648	775	950	1,120
Plastics and synthetic products	2821	1,261	1,350	1,193	1,425	1,250	995
Other		395	475	277	329	507	498
TOTAL		6,446	7,163	4,533	5,417	6,307	6,228

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

CADMIUM - U.S. SUPPLY
(Short Tons)

Year	Production ¹	% of Total Supply	Imports	%	Exports	Net Imports	%	Total Supply
1951	4,156	109.5	45	1.2	407	(-362)	(-9.5)	3,794
1952	4,284	87.9	740	15.2	151	589	12.1	4,873
1953	4,884	86.8	778	13.8	33	745	13.2	5,629
1954	4,776	106.7	201	4.5	500	(-299)	(-6.7)	4,477
1955	4,877	105.0	464	10.0	697	(-233)	(-5.0)	4,644
1956	5,307	85.3	1,558	25.0	642	916	14.7	6,223
1957	5,275	92.2	793	13.9	347	446	7.8	5,721
1958	4,837	95.8	501	9.9	290	211	4.2	5,048
1959	4,355	92.2	819	17.3	450	369	7.8	4,724
1960	5,223	116.8	471	10.5	1,224	(-753)	(-16.8)	4,470
1961	5,233	96.5	540	10.0	351	189	3.5	5,422
1962	5,569	96.5	559	9.7	359	200	3.5	5,769
1963	4,995	103.3	496	10.3	657	(-161)	(-3.3)	4,834
1964	5,229	103.3	552	10.9	720	(-168)	(-3.3)	5,061
1965	4,836	82.5	1,061	18.1	37	1,024	17.5	5,860
1966	5,230	77.8	1,679	25.0	190	1,489	22.2	6,719
1967	4,349	90.7	794	16.6	346	448	9.3	4,797
1968	5,326	88.4	964	16.0	265	699	11.6	6,025
1969	6,323	100.0	539	8.5	542	(-3)	0	6,320
1970	4,732	81.7	1,246	21.5	187	1,059	18.3	5,791
1971	3,965	70.0	1,749	30.8	33	1,716	30.0	5,681
1972	4,145	85.5	1,211	25.0	509	702	14.5	4,847
1973	3,714	67.4	1,946	35.3	153	1,793	32.6	5,507

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

¹Primary and secondary metal

CADMIUM - MAJOR U.S. IMPORT SOURCES
(Short Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Canada	106	8.5	188	10.8	534	44.1	805	41.4
Australia	160	12.9	257	14.7	203	16.7	359	18.4
Belgium-Luxembourg	86	6.9	229	13.1	109	9.0	336	17.3
Peru	152	12.2	166	9.5	148	12.2	103	5.3
Japan	466	37.4	469	26.8	64	5.3	20	1.0
TOTAL U.S. IMPORTS	1,246		1,749		1,211		1,946	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

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CADMIUM - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Production ¹	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves ^x
Canada	5.2	43.2	7.3	N.A.
Australia	3.9	34.4	4.4	
Belgium-Luxembourg	7.1	14.7	3.4	
Peru	1.2	64.4	2.5	
Japan	17.1	8.2	4.5	
(United States)	(22.9)			(25.7)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

¹Smelter production

CADMIUM - RESERVES AND RESOURCES

DOMESTIC

Reserves ¹	360,000 short tons
Resources ^x	~2,415,000 short tons

FOREIGN

Reserves ²	1,040,000 short tons
Resources ^x	~18,013,000 short tons

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975

^x U.S. Geological Survey, U.S. Mineral Resources (Professional Paper 820), 1973

¹ At 1973 consumption levels this is a forward reserve of 57.8 years

² At 1973 production levels this is a forward reserve of 69.2 years

CADMIUM - FOREIGN PRODUCTION AND CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Smelter Production</u>	<u>Consumption</u>
1950	2,030	
1951	2,535	
1952	2,517	
1953	2,902	
1954	3,274	
1955	4,373	
1956	4,693	
1957	5,076	
1958	5,964	
1959	6,995	
1960	7,028	
1961	7,617	
1962	7,332	
1963	8,007	
1964	8,775	
1965	8,279	
1966	9,092	
1967	10,185	
1968	11,227	9,000 ^x
1969	13,069	
1970	13,495	
1971	13,042	
1972	14,243	
1973	15,033	

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Mineral Facts and Problems,
1970

CHLORINE - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Consumption</u>
1964	6,096
1965	6,487
1966	7,135
1967	7,673
1968	8,450
1969	9,419
1970	9,754
1971	9,373
1972	9,900
1973	10,343

Source: U.S. Bureau of Mines, Minerals
in the U.S. Economy, 1975

CHLORINE - CONSUMPTION BY MAJOR END USE CATEGORY
(Thousand Short Tons)

Category	SIC Code	1968	1969	1970	1971	1972	1973
Paper products	2611, 2621	1,415	1,696	1,760	1,700	1,800	1,860 ¹
Plastic & synthetic products	2823	1,356	1,600	1,670	1,600	1,850	2,300
Chemicals:	281						
Solvents		1,190	1,250	1,300	1,250	1,400	2,400 ¹
Automotive fluids		928	500	900	850	850	1,000
Agriculture	2879	454	400	420	400	350	520
Water & sanitary services	4941, 4952	460	500	530	530	530	620
Other		2,647	3,073	3,174	3,043	3,120	1,640 ¹
TOTAL		8,450	9,419	9,754	9,373	9,900	10,340

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

¹A large segment of the industry formerly classified as "Other" was reclassified in 1973 into their proper categories "Plastics & synthetic products" and "Solvents."

CHLORINE - U.S. SUPPLY
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total U.S. Supply</u>	<u>Imports</u>	<u>%</u>	<u>Exports</u>	<u>Net Imports</u>	<u>%</u>	<u>Total</u>
1964	5,945	100.4	22	.4	44	(-) 22	(-) .4	5,923
1965	6,517	100.1	39	.6	43	(-) 4	(-) .1	6,513
1966	7,204	99.3	72	1.0	21	51	.7	7,255
1967	7,680	99.7	59	.8	36	23	.3	7,703
1968	8,444	99.9	42	.5	36	6	.1	8,450
1969	9,422	100.0	23	.2	26	(-) 3	(-) 0	9,419
1970	9,755	100.0	25	.3	26	(-) 1	(-) 0	9,754
1971	9,349	99.7	35	.4	11	24	.3	9,373
1972	9,869	99.7	38	.4	7	31	.3	9,900
1973	10,303	99.6	50	.5	13	37	.4	10,340

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

CHLORINE - MAJOR U.S. IMPORT SOURCE
(Thousand Short Tons)

Country	1968 ^x		1973 ^{xx}	
	Amount	% of Total U.S. Imports	Amount	% of Total U.S. Imports
Canada	41	97.6	47	94.0
TOTAL IMPORTS	42		50	

Sources: ^xU.S. Bureau of Mines, Mineral Facts and Problems, 1970

^{xx}U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

CHLORINE - MAJOR U.S. IMPORT SOURCE INFORMATION (1973)

Country	% of World Mine Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied
Canada	3.9	4.7	.5
(U.S.)	(36.1)		

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

CHLORINE - RESERVES AND RESOURCES
(Million Short Tons)

DOMESTIC

Reserves¹ >36,000

FOREIGN

Reserves Very large

Source: ¹U.S. Bureau of Mines, Mineral Facts and Problems, 1970

At 1974 consumption levels, this is a forward
reserve of >34.80 years.

CHLORINE - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Production</u>	<u>Consumption</u> ^x
1964	8,055	
1965	8,633	
1966	9,376	
1967	10,310	
1968	10,446	10,420
1969	12,378	
1970	13,494	
1971	15,465	
1972	15,815	
1973	18,266	

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

^xU.S. Bureau of Mines, Mineral Facts and Problems, 1970 (estimated)

CHROMITE - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Chromite Consumption</u>	<u>Chromium Consumption^x</u>
1950	980	
1951	1,213	
1952	1,186	
1953	1,336	
1954	914	
1955	1,584	
1956	1,847	
1957	1,760	
1958	1,221	
1959	1,337	
1960	1,220	
1961	1,200	
1962	1,131	
1963	1,187	
1964	1,451	591
1965	1,584	565
1966	1,461	603
1967	1,355	472
1968	1,316	502
1969	1,411	557
1970	1,403	539
1971	1,093	418
1972	1,140	558
1973	1,387	596

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Minerals in the U.S. Economy,
1975

CHROMIUM - U.S. CONSUMPTION BY MAJOR END USE CATEGORY
(Thousand Short Tons)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Metal:							
Transportation	37	80	90	91	80	95	107
Construction	34	109	118	121	91	125	135
Machinery	35	74	85	80	60	86	90
Fabricated metal products	363	26	29	30	25	34	36
Electrical	3297	15	16	16	14	18	18
Other		58	60	74	32	80	83
Nonmetal:							
Refractories	3297	94	94	90	63	70	77
Chemicals	281	24	25	25	20	27	23
Paints		10	10	10	9	10	10
Leather processing		13	14	13	10	15	17
TOTAL		502	557	539	418	558	596

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

CHROMITE - U.S. SUPPLY
(Thousand Short Tons)

Year	Imports	% of U.S. Consumption	Exports (incl. re-exports)	Net Imports	% of U.S. Consumption
1962	1,446	127.9	54	1,392	123.1
1963	1,391	117.2	74	1,317	111.0
1964	1,428	98.4	39	1,389	95.7
1965	1,518	95.8	102	1,416	89.4
1966	1,864	127.6	192	1,672	114.4
1967	1,240	91.5	165	1,075	79.3
1968	1,084	82.4	139	945	71.8
1969	1,106	78.4	199	992	70.3
1970	1,405	100.1	114	1,291	92.0
1971	1,299	118.4	180	1,119	102.4
1972	1,056	92.6	77	979	85.9
1973	931	149.0	55	876	76.8
1974	1,250 ^x	N.A.	150 ^x	1,100 ^x	N.A.

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

CHROMITE - MAJOR U.S. IMPORT SOURCES
(Thousand Short Tons)

Country	1970		1971		1972		1973	
	Amount	% Of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Republic of South Africa	407	29.0	422	32.5	249	23.6	303	32.5
USSR	469	33.4	307	23.6	434	41.1	242	26.0
Phillipines	210	14.9	159	12.2	131	12.4	190	20.4
Turkey	257	18.3	338	26.0	96	9.1	131	14.1
Rhodesia, Southern	--		26	2.0	43	4.1	21	2.3
TOTAL IMPORTS	1,405		1,299		1,056		931	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

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CHROMITE - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Mine Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves ^x
Republic of South Africa	24.2	20.2	27.5	64.7
USSR	28.5	18.0	28.9	1.2
Philippines	7.5	32.5	13.7	.3
Turkey	9.1	32.1	16.4	.3
Rhodesia, Southern	7.8	4.1	1.8	32.4

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

CHROMITE - RESERVES AND RESOURCES
(Thousand Short Tons)

DOMESTIC

Reserves	None
Identified Resources	6,104
Hypothetical and Speculative	2,912

FOREIGN

Reserves ¹	1,863,000
Identified Resources	2,989,896
Hypothetical and Speculative	4,029,424

Sources: U.S. Geological Survey, U.S. Mineral Resources (Professional Paper 820), 1973

¹At 1973 production rates this is a forward reserve of 248 years

CHROMITE - FOREIGN PRODUCTION
(Thousand Short Tons)

<u>Year</u>	<u>Chromite Production</u>	<u>Chromium Production</u> ^x
1964	4,583	1,474
1965	5,301	1,708
1966	4,843	1,550
1967	5,041	1,635
1968	5,444	1,736
1969	5,865	1,814
1970	6,672	2,050
1971	7,093	2,184
1972	6,977	2,184
1973	7,507	2,386

Sources: U.S. Bureau of Mines, Minerals Yearbook,
1950-1973

^xU.S. Bureau of Mines, Minerals in the U.S.
Economy, 1975

COAL - U.S. CONSUMPTION
(Millions of Short Tons)

<u>Year</u>	<u>Consumption</u>
1950	494.1
1951	505.9
1952	454.1
1953	454.8
1954	390.0
1955	447.0
1956	456.9
1957	434.5
1958	385.7
1959	385.1
1960	398.0
1961	390.3
1962	402.8
1963	423.3
1964	445.5
1965	472.1
1966	497.7
1967	491.2
1968	509.0
1969	516.1
1970	525.4
1971	501.8
1972	522.7
1973	561.7

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

COAL - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Millions of Short Tons)

<u>End-Use</u>	<u>Sic Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Household and Commercial		20.0	16.9	16.1	14.9	11.7	11.1
Electrical Utilities	4911	296.9	310.3	322.4	327.9	350.2	388.4
Food Products	20	8.5	7.8	7.6	6.2	7.5	5.4
Paper Products	26	14.9	13.6	13.2	10.8	10.2	9.5
Primary Metal Industries	23	101.1	105.7	108.2	94.9	99.5	106.3
Nonmetallic Products	32	13.4	12.3	11.8	9.7	9.7	8.4
Transportation	40, 44	.4	.3	.3	.2	.2	.1
Chemicals	28	22.4	20.5	19.8	16.1	15.2	14.0
Other		31.4	28.7	25.8	21.1	18.5	18.5
TOTAL		509.0	516.1	525.2	501.8	522.7	561.7

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

COAL - U.S. SUPPLY
(Millions of Short Tons)

<u>Year</u>	<u>Domestic Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Exports</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1950	560.4	105.5	.4	<.1	29.4	(-29.0)	(-5.5)	531.4
1951	576.3	112.1	.3	<.1	62.7	(-62.4)	(-12.1)	513.9
1952	507.4	111.4	.3	<.1	52.2	(-51.9)	(-11.4)	455.5
1953	488.2	108.0	.3	<.1	36.5	(-36.2)	(-8.0)	452.0
1954	420.8	108.7	.2	<.1	33.9	(-33.7)	(-8.7)	387.1
1955	490.8	112.4	.3	<.1	54.4	(-54.1)	(-12.4)	436.7
1956	529.8	116.1	.4	.1	73.8	(-73.4)	(-16.1)	456.4
1957	518.0	118.4	.4	.1	80.8	(-80.4)	(-18.4)	437.6
1958	433.7	113.7	.3	<.1	52.6	(-52.3)	(-13.7)	381.4
1959	432.7	109.8	.4	.1	39.0	(-38.6)	(-9.8)	394.1
1960	434.3	109.5	.3	<.1	38.0	(-37.7)	(-9.5)	396.6
1961	420.5	109.4	.2	<.1	36.4	(-36.2)	(-9.4)	384.3
1962	439.1	110.1	.2	<.1	40.4	(-40.2)	(-10.1)	398.9
1963	477.2	111.8	.2	<.1	50.4	(-50.2)	(-11.8)	427.0
1964	504.2	110.8	.3	<.1	49.5	(-49.2)	(-10.8)	455.0
1965	527.0	111.0	.2	<.1	52.2	(-52.0)	(-11.0)	475.0
1966	546.8	110.2	.2	<.1	50.8	(-50.6)	(-10.2)	496.2
1967	534.9	110.5	.2	<.1	51.0	(-50.8)	(-10.5)	484.1
1968	556.8	110.2	.2	<.1	51.9	(-51.7)	(-10.2)	505.1
1969	571.0	111.3	.1	<.1	57.9	(-57.8)	(-11.3)	513.2
1970	612.6	113.4	<.1	<.1	72.4	(-72.4)	(-13.4)	540.2
1971	530.9	112.1	.1	<.1	57.3	(-57.2)	(-12.1)	473.7
1972	602.5	110.4	<.1	<.1	56.7	(-56.7)	(-10.4)	545.8
1973	598.5	109.8	.1	<.1	53.6	(-53.5)	(-9.8)	545.0

Source: Bureau of Mines, Minerals Yearbook, 1950-1973.

COAL - RESERVES AND RESOURCES

Domestic

Reserves (Recoverable) - 434×10^9 short tons

Reserves (Indicated and Measured)¹ - $1,581 \times 10^9$ short tons

Reserves (Indicated, Measured and Inferred)* -
 $3,210 \times 10^9$ short tons

Foreign

Reserves (Indicated and Measured)² - $10,178 \times 10^9$ short tons

¹At 1973 consumption levels this is a forward reserve of 2,815 years.

²At 1973 production levels this is a forward reserve of 3,532 years.

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975.

* Science Policy Research Division, Library of Congress,
Energy Facts, Prepared for the House Committee on
Science and Astronautics, 1973.

COAL - FOREIGN PRODUCTION AND CONSUMPTION
(Millions of Short Tons)

<u>Year</u>	<u>Production</u>
1950	1,039.6
1951	1,101.6
1952	1,147.5
1953	1,175.7
1954	1,752.0
1955	1,861.5
1956	1,955.4
1957	2,057.0
1958	2,257.0
1959	2,344.3
1960	2,465.0
1961	2,315.1
1962	2,370.6
1963	2,449.5
1964	2,526.9
1965	2,551.5
1966	2,567.6
1967	2,431.8
1968	2,533.9
1969	2,598.9
1970	2,674.3
1971	2,748.2
1972	2,750.1
1973	2,881.9

COBALT - U.S. CONSUMPTION
(Thousand Pounds)

<u>Year</u>	<u>Industrial Consumption*</u>
1964	13,979
1965	14,384
1966	17,948
1967	15,340
1968	14,584
1969	19,512
1970	16,262
1971	13,543
1972	19,465
1973	22,176

Sources: U.S. Bureau of Mines, Minerals Yearbook,
1950 - 1973.

*U.S. Bureau of Mines, Minerals in the U.S.
Economy, 1975.

COBALT - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Pounds)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Nonmetal							
Paints	2851	1,451	1,285	2,152	2,042	2,323	2,654
Chemicals	2819	882	1,382	538	707	1,270	1,640
Ceramics and glass	326	1,281	858	1,890	1,768	1,982	2,234
Metal:							
Transportation:							
Aircraft	3722	2,544	4,046	3,297	2,518	4,294	4,035
Electrical:	36	5,100	4,024	4,589	3,633	6,069	6,478
Machinery:							
Machine tools	3545	1,616	1,911	1,882	1,376	1,717	2,459
Construction machinery	353	998	1,268	1,179	1,080	1,190	2,037
Coating and plating:			3,351				
Other:		<u>712</u>	<u>1,387</u>	<u>735</u>	<u>419</u>	<u>620</u>	<u>639</u>
Total		14,584	19,512	16,262	13,543	19,465	22,176

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

COBALT - U.S. SUPPLY

(Thousand Pounds)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Scrap</u> ¹	<u>%</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	1,084	8.0	148	1.1	12,443	91.7	12,335	90.9	13,567
1965	1,186	7.2	87	.5	15,408	93.0	15,292	92.3	16,565
1966	1,215	6.1	48	.2	18,823	94.2	18,723	93.7	19,986
1967	1,168	12.6	120	1.3	8,215	88.3	8,015	86.1	9,303
1968	1,178	13.1	145	1.6	9,068	101.1	7,648	85.3	8,971
1969	1,003	7.9	328	2.6	12,911	101.3	11,414	89.6	12,745
1970	697	6.0	69	.6	12,417	106.1	10,939	93.4	11,705
1971	690	6.1	125	1.1	10,912	96.0	10,547	92.8	11,362
1972	-	0	197	1.5	13,915	108.6	12,622	98.5	12,819
1973	-	0	454	2.5	19,201	105.2	17,803	97.5	18,257

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950 - 1973.

Billrey, Joseph H., Cobalt, A Materials Survey, 1962.

¹It was not possible to break scrap down into old and new.

COBALT - MAJOR U.S. IMPORT SOURCES

(Thousand Pounds - Gross Weight)

	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
<u>Country</u>	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Zaire	6,930	54.4	4,572	41.0	5,118	35.8	11,196	57.4
Belgium-Luxembourg	3,624	28.5	3,225	28.9	4,222	29.5	5,056	25.9
Finland	452	3.6	1,208	10.8	1,299	9.1	909	4.7
Zambia	-	-	-	-	1,071	7.5	-	-
Canada	463	3.6	909	8.2	854	6.0	730	3.7
Norway	794	6.2	800	7.2	915	6.4	972	5.0
Total Imports	12,740		11,147		14,298		19,510	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970 - 1973.

COBALT - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970 - 1973)

<u>Country</u>	<u>% of World Mine Production</u>	<u>% of Country's Production Exported to the U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Resources*</u>
Zaire	58.0	70.3 ¹	61.5 ¹	27.5
Finland	5.2	69.1	5.4	N.A.
Zambia	8.7	11.4	1.5	14.0
Canada	7.9	79.6 ²	9.0 ²	7.1
(U.S.)	(1.3)		(1.9)	(1.0)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970 - 1973.

*U.S. Bureau of Mines, Commodity Data Summaries, 1973.

¹Virtually all of the cobalt exported from Belgium-Luxembourg comes from Zaire and is counted towards production from Zaire.

²Virtually all of the cobalt exported from Norway comes from Canada and is counted towards production from Canada.

COBALT - RESERVES AND RESOURCES

D O M E S T I C

Reserves¹ - 28,000 short tons

Resources - Huge

F O R E I G N

Reserves² - 2,702,000 short tons

Resources - Huge

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1973.

U.S. Geological Survey, United States Mineral Resources, 1973.

¹At 1973 consumption levels this is a forward reserve of 2.5 years.

²At 1973 production levels this is a forward reserve of 95.6 years.

COBALT - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Pounds)

<u>Year</u>	<u>Production</u>	<u>Consumption</u>
1964	38,150	
1965	40,624	
1966	46,782	
1967	44,028	
1968	41,968	30,000*
1969	43,556	
1970	52,590	
1971	47,908	
1972	51,290	
1973	56,510	

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

U.S. Bureau of Mines, Mineral Facts and Problems, 1970.

COPPER - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Industrial Consumption^x</u>	<u>Consumption of Refined</u>
1950		1,424
1951		1,417
1952		1,480
1953		1,494
1954		1,255
1955		1,502
1956		1,521
1957		1,352
1958		1,251
1959		1,463
1960		1,350
1961		1,463
1962		1,600
1963		1,744
1964	2,040	1,825
1965	2,126	2,005
1966	2,433	2,360
1967	2,032	1,936
1968	2,061	1,880
1969	2,271	2,142
1970	2,076	2,043
1971	2,072	2,020
1972	2,409	2,239
1973	2,384	2,437

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1963

^xU.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

COPPER - U.S. CONSUMPTION BY MAJOR END USE CATEGORY
(Thousand Short Tons)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Electrical	36	1,046	1,193	1,101	1,113	1,252	1,445
Construction	344	316	341	328	351	432	336
Machinery	35	239	254	251	243	300	240
Transportation	37	193	198	173	192	227	187
Ordinance	348	164	172	119	69	78	57
Other		103	113	104	104	120	119
<u>TOTAL</u>		2,061	2,271	2,076	2,072	2,409	2,384

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

COPPER - UNITED STATES SUPPLY

(Thousand Short Tons)

Year	Mine Production	(%)	Old Scrap	(%)	Total Scrap	Imports	(%)	Net Imports	(%)	Total Supply ¹
1950	909	52.6	485	28.1	977	690	39.9	335	19.3	1,729
51	928	53.5	458	26.4	932	489	28.2	348	20.1	1,734
52	925	52.1	415	23.4	903	619	34.9	435	24.5	1,775
53	926	49.1	429	22.8	959	676	35.8	531	28.1	1,886
54	836	53.9	407	26.2	840	603	38.9	309	19.9	1,552
55	999	53.8	515	27.7	989	588	31.7	344	18.5	1,858
56	1,104	59.1	469	25.1	931	559	29.9	296	15.8	1,869
57	1,087	61.1	445	25.0	842	658	37.0	248	13.9	1,780
58	979	73.2	411	30.7	797	365	27.3	-53	(-3.9)	1,337
59	825	59.7	471	34.1	931	257	18.6	86	6.2	1,382
1960	1,080	89.8	429	35.7	871	198	16.5	-306	(-25.5)	1,203
61	1,165	95.0	411	33.5	849	119	9.7	-349	(-28.4)	1,227
62	1,228	85.9	416	29.1	922	136	9.5	-215	(-15.0)	1,429
63	1,213	82.9	422	28.8	974	155	10.6	-171	(-11.7)	1,464
64	1,247	76.7	474	29.2	1,093	270	16.6	-95	(-5.8)	1,626
65	1,352	80.0	513	30.3	1,253	198	11.7	-174	(-10.3)	1,691
66	1,429	67.5	535	25.3	1,334	447	21.1	153	7.2	2,117
67	954	51.2	483	25.9	1,160	649	34.8	427	22.9	1,864
68	1,205	57.9	521	25.1	1,218	710	34.1	354	17.0	2,080
69	1,545	66.6	575	24.8	1,376	414	17.8	201	8.6	2,321
1970	1,720	73.5	504	21.5	1,248	424	18.1	117	5.0	2,341
71	1,522	74.1	445	21.7	1,200	331	16.1	88	4.2	2,055
72	1,665	72.3	458	19.9	1,301	416	18.1	180	7.8	2,303
73	1,718	72.9	473	20.1	1,451	418	17.7	167	7.0	2,358

¹Total = mine production + old scrap + net imports

Sources: U. S. Bureau of Mines, Minerals Yearbook (1950-1972)

COPPER - MAJOR U.S. IMPORT SOURCES
(Short Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Canada	96,845	24.7	135,428	37.7	150,803	36.3	155,179	37.2
Peru	110,026	28.0	102,410	28.5	93,249	22.4	99,977	24.0
Chile	114,880	29.3	51,651	14.4	60,131	14.5	58,763	14.1
Republic of South Africa	28,946	7.4	21,247	5.9	23,609	5.7	26,360	6.4
Philippines	18,700	4.8	13,616	3.8	30,122	7.2	17,842	4.3
Mexico	4,361	1.1	7,640	2.1	18,617	4.5	16,711	4.0
TOTAL IMPORTS	392,480		359,479		415,611		417,434	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

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COPPER - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves ^x
Canada	10.8	17.4	6.0	9.3
Peru	3.4	42.2	4.5	7.0
Chile	11.2	8.9	3.2	16.3
Republic of South Africa	2.5	14.1	1.1	N.A.
Philippines	3.1	9.2	.9	N.A.
Mexico	1.1	15.2	.5	21.0
(U.S.)	(23.2)			

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-73

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

COPPER - RESERVES AND RESOURCES

Domestic[†]

Reserves¹ ~ 90,000,000 short tons

Resources *

1) Identified	~ 76 million short tons			
2) Hypothetical	~ 100	"	"	"
3) Speculative	~ 120	"	"	"
4) Subeconomic	~ 110	"	"	"

~ 496 x 10⁶ short tons

Foreign^{*}

Reserves² ~ 340,000,000 short tons

Resources

1) Identified	~ 268 million short tons			
2) Hypothetical	~ 300	"	"	"
3) Speculative	~ 200	"	"	"
4) Subeconomic	~ 370	"	"	"

~ 1.408 x 10⁹ short tons

Sources:

- † U. S. Bureau of Mines, Commodity Data Summaries 1975.
U. S. Geological Survey Professional Paper 820, 1973.

- * U. S. Bureau of Mines, Commodity Data Summaries, 1975.

¹ At 1973 primary copper consumption levels, this is a forward reserve of 47 years.

² At 1973 primary copper consumption levels, this is a forward reserve of 54 years.

COPPER - FOREIGN SUPPLY AND DEMAND
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption (Primary)</u>
1950	2,758 ^x	1,447
1951	2,900	1,656
1952	3,017	1,712
1953	3,055	1,543
1954	3,111	1,969
1955	3,416	2,103
1956	3,786	2,242
1957	3,892	2,479
1958	3,780	2,768
1959	4,024	2,783
1960	4,652	3,263
1961	4,848	3,519
1962	5,084	3,471
1963	5,088	3,629
1964	5,297	4,008
1965	5,549	3,970
1966	5,485	3,887
1967	5,224	4,098
1968	5,641	4,494
1969	6,224	4,880
1970	6,638	5,061
1971	6,653	5,212
1972	7,314	5,676
1973	7,857	6,269
1974	7,940 ^{xx}	

Sources: Metal Statistics, Metallgesellschaft Aktiengesellschaft
Frankfurt am Main (1950-1973)

^xU.S. Bureau of Mines, Minerals Yearbook

^{xx}U.S. Bureau of Mines, Commodity Data Summaries, 1975

FELDSPAR - U.S. CONSUMPTION
(short tons)

<u>Year</u>	<u>Apparent Consumption</u>	<u>Industrial Demand*</u>
1964	657,669	647,000
1965	699,568	664,000
1966	734,106	704,000
1967	689,558	663,000
1968	747,800	731,000
1969	754,915	793,000
1970	726,321	648,000
1971	742,944	702,000
1972	732,626	681,000
1973	792,164	769,000

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.
U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

FELDSPAR - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(thousand short tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Glass (container and flat)	3221, 3211	396	446	357	358	338	404
Ceramics (vitreous china)	326	240	242	W	W	302	297
Coating and plating (porcelain enamels)	3479	21	26	W	W	9	W
Other		<u>74</u>	<u>79</u>	<u>291</u>	<u>344</u>	<u>32</u>	<u>68</u>
Total		731	793	648	702	681	769

W: Withheld to avoid disclosing individual company confidential data - included with "Other."

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

FELDSPAR - U.S. SUPPLY
(short tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	657,657		3,562				
1965	699,550		3,870				
1966	734,106		3,632				
1967	689,245		3,431				
1968	747,800	101.4	3,782	.5	(-10,544)	(- .4)	737,256
1969	754,863	100.1	5,252	.7	(- 1,073)	(- .1)	753,790
1970	726,069	100.2	3,889	.5	(- 1,681)	(- .2)	724,388
1971	742,810	100.2	2,509	.3	(- 1,475)	(- .2)	741,335
1972	732,439	100.6	1,132	.2	(- 4,134)	(- .6)	728,305
1973	791,900	101.2	367	< .1	(- 9,187)	(-1.2)	782,713

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

FELDSPAR - MAJOR U.S. IMPORT SOURCES
(short tons)

	<u>1970</u>		<u>1971</u>		<u>1972</u>		<u>1973</u>	
	<u>Amount</u>	<u>% of Total U.S. Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Rep. of S. Africa	2	< .1	-		-		218	59.4
Canada	3,696	95.0	2,158	86.0	935	82.6	149	40.6
United Kingdom	-	-	186	7.4	148	13.1	-	-
Sweden	179	4.6	121	4.8	49	4.3	-	-
Total Imports	3,889		2,509		1,132		367	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

FELDSPAR - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

<u>Country</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Reserves</u>
Rep. of South Africa	.9	.3	< .1	N.A.
Canada	.5	15.4	.2	N.A.
United Kingdom	2.6	.2	< .1	N.A.
Sweden	1.7	.3	< .1	10.0
(U.S.)	(35.5)			(60.0)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.
U.S. Bureau of Mines, Commodity Data Summaries, 1975.

FELDSPAR - RESERVES AND RESOURCES

DOMESTIC

Reserves ¹	600,000,000 short tons
Resources	Very Large

FOREIGN

Reserves ²	400,000,000 short tons
Resources	Very Large

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975.
U.S. Geological Survey, United States Mineral Resources
(Professional Paper 820), 1973.

¹At 1973 consumption levels, this is a forward reserve of 757 years.

²At 1973 production levels, this is a forward reserve of 200 years.

FELDSPAR - FOREIGN PRODUCTION AND CONSUMPTION
(thousand short tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1964	1,427	
1965	1,510	
1966	1,636	
1967	1,556	
1968	1,725	1,606*
1969	1,942	
1970	2,060	
1971	2,006	
1972	1,902	
1973	2,002	

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

* U.S. Bureau of Mines, Mineral Facts and Problems, 1970.

FLUORINE - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Industrial Demand</u>
1964	378
1965	420
1966	483
1967	555
1968	646
1969	603
1970	611
1971	645
1972	638
1973	780

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

FLUORINE - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Ton)

<u>End-Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Chemical industry	257	228	230	223	227	230	257
Iron & steel production:	3312						
Steel flux (BOF & OHF)		215	190	201	207	205	254
Electrometallurgy flux		30	30	37	45	49	79
Total		245	220	238	252	254	333
Iron and steel foundries	332	12	9	10	14	11	19
Nonferrous metal production:	3334						
Aluminum & magnesium flux		114	122	125	129	123	147
Ferroalloy & nonferrous flux		11	7	1	5	1	6
Total		125	129	126	134	124	153
Ceramics and glass	3211	16	10	10	9	10	9
Other		20	5	4	9	9	9
Total		646	603	611	645	638	780

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

FLUORINE - U.S. SUPPLY
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	98	26.2	278	74.3	276	73.8	374
1965	109	26.3	310	74.7	306	73.7	415
1966	115	21.9	414	78.7	411	78.1	526
1967	134	24.5	419	76.5	414	75.5	548
1968	118	19.8	483	81.2	477	80.2	595
1969	82	14.6	481	85.7	479	85.4	561
1970	121	19.7	501	81.5	494	80.3	615
1971	122	20.3	483	80.5	478	79.7	600
1972	143	21.2	532	78.9	531	78.8	674
1973	151	21.7	545	78.4	544	78.3	695

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

FLUORINE - MAJOR U. S. IMPORT SOURCES

<u>Country</u>	1 9 6 8		1 9 7 3	
	<u>Amount</u> *	<u>% of Total</u> <u>U. S. Import</u>	<u>Amount</u>	<u>% of Total</u> <u>U. S. Import</u>
Mexico	360	74.5	401	73.6
Spain	61	12.6	80	14.7
Italy	45	9.3	26	4.8
Tunisia	-	-	11	2.0
United Kingdom	7	1.5	9	1.7
TOTAL U. S. IMPORTS	483		545	

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

* U. S. Bureau of Mines, Mineral Facts and Problems, 1970.

FLUORINE - MAJOR U. S. IMPORT SOURCE INFORMATION
(1973)

<u>Country</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U. S.</u>	<u>% of U. S. Demand Supplied</u>	<u>% of World Fluorspar Reserves</u> *
Mexico	23.7	74.4	51.4	15.0
Spain	8.5	41.2	10.3	4.3
Italy	5.2	22.2	3.3	4.7
Tunisia	1.0	47.8	1.4	n.a.
United Kingdom	4.4	9.1	1.2	8.0
(United States)	(6.6)			(5.7)

Sources: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

* U. S. Bureau of Mines, Commodity Data Summaries, 1975.

FLUORSPAR - RESERVES AND RESOURCES

D o m e s t i c

Reserves ¹	17,000,000 short tons
Resources	62,000,000 short tons

F o r e i g n

Reserves ²	283,000,000 short tons
Resources	778,000,000 short tons

World identifiable resources of by-product fluorine in phosphate rock may total 150 million tons (equivalent to over 300 million tons of fluorspar). Total resources of fluorine in phosphate rock may be 10 times larger.

¹ At 1973 consumption levels, this is a forward reserve of 7.6 years (assuming fluorspar is 35% fluorine).

² At 1973 production levels, this is a forward reserve of 61.7 years. (Assuming fluorspar is 50% fluorine.)

Source: U. S. Bureau of Mines, Commodity Data Summaries, 1975.

FLUORINE - FOREIGN PRODUCTION AND CONSUMPTION

(thousand short tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1964	1,083	
65	1,220	
66	1,255	
67	1,421	
68	1,682	1,154*
69	1,723	
1970	1,963	
71	2,179	
72	2,205	
73	2,122	

Sources: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.
U. S. Bureau of Mines, Mineral Facts and Problems, 1970.

GOLD - U.S. CONSUMPTION
(Thousand Troy Ounces)

<u>Year</u>	<u>Consumption</u>	<u>Industrial Consumption*</u>
1964	4,801	4,900
1965	5,276	6,010
1966	6,062	7,280
1967	6,294	7,410
1968	6,604	6,927
1969	7,109	7,408
1970	5,973	6,891
1971	6,933	6,684
1972	7,285	7,638
1973	6,729	6,904

Sources: U.S. Bureau of Mines, Minerals Yearbook,
1950 - 1973.

*U.S. Bureau of Mines, Minerals in the U.S.
Economy, 1975.

GOLD - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY

(Thousand Troy Ounces)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Jewelry and Arts	3911	4,100	4,000	3,850	4,144	4,554	3,563
Dental Supplies	3843	810	740	760	722	786	697
Electronics	3679	2,017	2,668	2,281	1,818	2,298	2,644
		<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Total		6,927	7,408	6,891	6,684	7,638	6,904

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

GOLD - U.S. SUPPLY
(Thousand Troy Ounces)

Year	Mine Production	% of Total Supply	Old Scrap	%	Imports	%	Net Imports	%	Total Supply
1964	1,456	69.0	500	23.7	176	8.3	154	7.3	2,110
1965	1,705	67.4	600	23.7	276	10.9	226	8.9	2,531
1966	1,803	68.6	700	26.6	177	6.7	126	4.8	2,629
1967	1,584	63.7	900	36.2	115	4.6	2	.1	2,486
1968	1,478	25.3	900	15.4	3,688	63.0	3,474	59.3	5,852
1969	1,733	21.8	900	11.3	5,389	67.7	5,330	66.9	7,963
1970	1,743	26.0	850	12.7	4,123	61.5	4,117	61.3	6,710
1971	1,495	21.0	700	9.8	6,216	87.1	4,938	69.2	7,133
1972	1,450	19.0	650	8.5	6,308	82.5	5,542	72.5	7,642
1973	1,176	22.4	600	11.4	4,082	77.7	3,481	83.2	5,257

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Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

GOLD - MAJOR U.S. IMPORT SOURCE INFORMATION
(1973)

<u>Country</u>	<u>% of World Production</u>	<u>Amount Imported by U.S. (1000 Troy Ounces)</u>	<u>% of U.S. Imports</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Consumption Supplied</u>	<u>% of World Reserves*</u>
Canada	4.5	1,498	36.7	77.6	21.7	(3.1)
Republic of South Africa (Via Switzerland, U.K.)	63.8	1,243	30.5	4.5	18.0	(61.5)
U.S.S.R.	16.5	794	19.5	11.2	11.5	(~15.0)
Australia	2.2	35	.9	3.7	.5	1.5
(U.S.)	(2.7)				(17.0)	(9.2)

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

GOLD - RESERVES AND RESOURCES

D O M E S T I C

Reserves¹ - 120×10^6 troy ounces

Resources - Very large

F O R E I G N

Reserves² - $1,180 \times 10^6$ troy ounces

Resources - Very large

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975.

¹At 1973 consumption levels this represents a forward reserve of 17.4 years.

²At 1973 production levels this is a forward reserve of 28.2 years.

GOLD - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Troy Ounces)

<u>Year</u>	<u>Production</u>	<u>Consumption*</u>
1964	43,385	
1965	44,520	
1966	44,777	
1967	44,153	23,000
1968	44,687	
1969	44,879	
1970	45,779	
1971	45,000	
1972	43,268	
1973	41,894	

Sources: U.S. Bureau of Mines, Minerals Yearbook,
1950 - 1973.

*U.S. Bureau of Mines, Mineral Facts and Problems,
1970.

GRAPHITE (NATURAL) - U.S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Consumption</u>
1963	N.A. ¹
1964	55,000
1965	59,000
1966	58,000
1967	56,000
1968	60,000
1969	61,000
1970	51,000
1971	60,000
1972	70,000
1973	75,000
1974	68,000 ^x

Source: U.S. Bureau of Mines, Minerals
in the U.S. Economy, 1975

^xU.S. Bureau of Mines, Commodity
Data Summaries, 1974, 1975

¹Bureau of Mines published consumption
figures for earlier years, but they
are admittedly incomplete and under-
estimate actual consumption by 35-45
percent

GRAPHITE (NATURAL) - CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Refractories:	3297						
Foundries (facings)		23	21	17	16	21	20
Refractories (other than crucibles)		8	7	7	W	9	15
Refractories (crucibles)		<u>4</u>	<u>5</u>	<u>5</u>	<u>W</u>	<u>5</u>	<u>3</u>
Total		35	33	29	30	35	38
Iron & steel production	3312	7	8	5	6	11	12
Lubricants	2992	5	5	5	5	6	6
Batteries	3692	W	W	1	1	1	1
Pencils	3952	2	2	2	2	2	2
Transportation (brake lining)	3292	1	2	1	2	2	2
Other		W	W	8	14	13	14
TOTAL		60	61	51	60	70	75

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

GRAPHITE (NATURAL) - U.S. SUPPLY
(Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Percent of Total Consumption</u>	<u>Imports</u>	<u>Percent of Total Consumption</u>	<u>Exports</u>	<u>Net Imports</u>	<u>Percent of Total Consumption</u>	<u>Total</u>
1968	3,000 ^{xx}	4.5 ¹	67,922	101.8 ¹	4,169	63,753	95.5 ¹	66,753
1969	W		58,459	95.8	10,264	48,195	79.0	N.A.
1970			66,449	130.3	5,783	60,666	119.0	N.A.
1971			57,756	96.3	5,733	52,023	86.7	N.A.
1972			64,135	91.6	7,289	56,846	81.2	N.A.
1973			77,376	102.9	7,953	69,423	92.3	N.A.
1974			81,000 ^x	119.1	13,000 ^x	68,000	100.0	N.A.

Source: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

^{xx}U.S. Bureau of Mines, Mineral Facts and Problems, 1970

W - withheld

¹Percent of total supply

GRAPHITE (NATURAL) - MAJOR U.S. IMPORT SOURCES
(Short Tons)

Country	1970		1971		1972		1973	
	Amount	Percent of Total U.S. Imports	Amount	Percent of Total U.S. Imports	Amount	Percent of Total U.S. Imports	Amount	Percent of Total U.S. Imports
Mexico	50,307	75.8	46,182	80.4	47,438	74.4	63,180	82.1
Malagasy Republic	5,706	8.6	4,364	7.6	6,301	9.9	3,592	4.7
Norway	4,403	6.6	2,830	4.9	3,568	5.6	2,330	3.0
Sri Lanka	2,506	3.8	2,275	4.0	2,810	4.4	2,987	3.9
West Germany	2,328	3.5	1,597	2.8	2,178	3.4	2,545	3.3
TOTAL IMPORTS	66,340		57,430		63,763		76,994	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

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GRAPHITE (NATURAL) - U.S. IMPORT SOURCE INFORMATION
(1970-1972)

Country	Percent of Foreign Mine Production	Percent of Country's Production Exported to the U.S.	Percent of U.S. Demand Supplied
Mexico	14.0	80.8	79.5
Malagasy Republic	5.0	25.5	9.0
Norway	2.4	43.6	6.0
Sri Lanka	2.1	28.6	4.2
West Germany	3.5	13.7	3.4
(N. Korea)	(20.0)		

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

GRAPHITE (NATURAL) - RESERVES AND RESOURCES
(Short Tons)

DOMESTIC

Reserves ^x	Insignificant
Identified Resources	>10,500,000

FOREIGN

Resources	Very Large
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Sources: U.S. Geological Survey (Professional Paper 820),
United States Mineral Resources, 1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

GRAPHITE (NATURAL) - FOREIGN PRODUCTION AND CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1968	481,793	470,000 ^e
1969	414,194	
1970	433,047	
1971	433,925	
1972	397,682	
1973	415,000 ^x	
1974	405,000 ^x	

Sources: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

^eEstimated by U.S. Bureau of Mines, Mineral Facts and Problems, 1970

IRON AND STEEL - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Iron Ore Consumption</u>	<u>Scrap Consumption</u>	<u>Steel Production</u>
1950	119,403	68,901	96,836
1951	126,617	76,728	105,200
1952	112,718	69,023	93,168
1953	136,780	77,131	111,610
1954	105,537	61,355	88,312
1955	140,031	81,375	117,036
1956	140,192	80,315	115,216
1957	144,900	73,549	112,715
1958	102,928	56,360	85,255
1959	104,901	66,062	93,446
1960	121,016	66,469	99,282
1961	111,165	64,327	98,014
1962	111,509	66,160	98,328
1963	126,039	74,621	109,261
1964	148,207	84,626	127,076
1965	147,715	90,359	131,462
1966	150,133	91,583	134,101
1967	142,715	85,361	127,213
1968	147,563	87,060	131,462
1969	157,063	94,816	141,262
1970	147,360	85,559	131,514
1971	130,140	82,567	120,443
1972	142,176	93,371	133,241
1973	164,613	103,589	150,800

Source: U.S. Bureau of Mines, Minerals Yearbook

IRON ORE - INTERMEDIATE CONSUMPTION
(Thousand Short Tons)

Source	1970		1971		1972		1973	
	Amount	% of Total Consumption	Amount	%	Amount	%	Amount	%
Blast Furnaces	349,000	98.9	127,415	97.9	139,849	98.4	161,518	98.2
Steel Furnaces	3,331	.9	2,085	1.6	1,652	1.2	2,337	1.4
Miscellaneous	469	.2	613	.5	675	.4	697	.4
TOTAL	352,800		130,113		142,176		164,553	

Source: U.S. Bureau of Mines, Minerals Yearbook

STEEL - CONSUMPTION BY MAJOR END USE CATEGORY
(Million Short Tons)

Category	SIC Code	1968	1969	1970	1971	1972	1973
Transportation	37	31.0	30.8	26.3	29.0	30.2	42.2
Construction	344	29.9	30.2	29.0	27.9	29.7	40.4
Machinery	35	21.3	22.0	20.4	19.4	21.6	28.5
Cans & containers	341	8.7	7.9	8.5	7.9	7.3	8.9
Oil & gas industries	13,461,492	5.2	5.2	4.9	5.1	5.6	7.8
Appliances & equipment	363	6.0	6.2	6.0	5.7	6.4	8.5
Other		14.9	24.2	21.8	13.1	24.1	6.2
TOTAL		117.0	126.5	116.9	108.1	124.9	142.5

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

IRON ORE - U.S. SUPPLY
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>(%)</u>	<u>Exports</u>	<u>Net Imports</u>	<u>(%)</u>	<u>Total</u>
1950	109,810	94.5	9,275	8.0	2,857	6,418	5.5	116,228
1951	130,486	95.3	11,357	8.3	4,849	6,508	4.7	136,994
1952	109,668	95.5	10,932	9.5	5,738	5,194	4.5	114,862
1953	132,154	94.5	12,403	8.9	4,762	7,641	5.5	139,795
1954	87,505	86.1	17,688	17.4	3,524	14,164	13.9	101,669
1955	115,363	84.5	26,289	19.3	5,059	21,230	15.5	136,593
1956	109,622	79.7	34,060	24.8	6,169	27,891	20.3	137,513
1957	118,886	78.8	37,689	25.0	5,602	32,087	21.2	150,973
1958	75,834	73.9	30,849	30.0	4,002	26,847	26.2	102,681
1959	67,509	64.9	39,891	38.3	3,323	36,568	35.1	104,077
1960	99,438	75.2	38,727	29.3	5,906	32,821	24.8	132,259
1961	79,889	77.4	28,902	28.0	5,553	23,349	22.6	103,238
1962	80,449	72.3	37,418	33.6	6,606	30,812	27.7	111,261
1963	82,431	73.6	37,255	33.3	7,629	29,626	26.4	112,057
1964	98,016	70.5	47,497	35.3	7,799	39,698	29.5	134,714
1965	97,932	69.7	50,515	36.0	7,935	42,580	20.3	140,512
1966	100,965	70.1	51,810	36.0	8,713	43,097	29.9	144,062
1967	94,280	68.5	49,964	36.3	6,615	43,349	31.5	137,629
1968	96,169	69.3	49,214	35.5	6,590	42,624	30.7	138,793
1969	98,927	71.3	45,620	32.9	5,779	39,841	28.7	138,768
1970	100,531	69.5	50,278	34.8	6,151	44,127	30.5	144,658
1971	90,453	68.5	44,939	34.1	3,428	41,511	31.5	131,964
1972	84,486	69.1	40,052	32.8	2,346	37,706	30.9	122,192
1973	98,189	68.4	48,492	33.8	3,077	45,415	31.6	143,604

Source: U.S. Bureau of Mines, Minerals Yearbook

IRON ORE - MAJOR U.S. IMPORT SOURCES
(Thousand Short Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total Imports	Amount	% of Total Imports	Amount	% of Total Imports	Amount	% of Total Imports
Canada	26,806	53.3	22,783	50.7	20,348	50.8	24,223	50.0
Venezuela	14,589	29.0	14,507	32.3	12,237	30.6	14,726	30.4
Liberia	2,098	4.2	2,059	4.6	3,092	7.7	3,062	6.3
Peru	1,489	3.0	1,191	2.7	1,476	3.7	1,681	3.5
Brazil	2,230	4.4	1,985	4.4	1,249	3.1	3,565	7.4
Australia	715	1.4	1,129	2.5	769	1.9	520	1.1
TOTAL	50,278		44,939		40,052		48,492	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

IRON ORE - U.S. IMPORT SOURCE INFORMATION
(Thousand Short Tons)
(1970-1973)

Country	% of World Mine Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves ^x
Canada	5.7	47.2	16.1	14.5
Venezuela	2.6	61.3	9.6	1.5
Liberia	2.9	10.0	1.8	.3
Peru	1.2	14.3	1.0	N.A.
Brazil	5.7	4.5	1.5	10.8
Australia	8.2	1.1	.5	6.4
(U.S.)	(10.6)			(3.6)

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

IRON ORE - RESERVES AND RESOURCES
(Million Short Tons)

DOMESTIC

Reserves ^{x,1}	10,080	(2,000 Tons of Iron)
Identified Resources	113,120	

FOREIGN

Reserves ^{x,2}	268,800	(95,000 Tons of Iron)
Identified Resources	759,360	

Sources: U.S. Geological Survey (Professional Paper 820), United States Mineral Resources, 1973

^x U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹ At 1973 consumption rate, this is a forward reserve of 12.2 years.

² At 1973 production rate, this is a forward reserve of 111.2 years.

IRON AND STEEL - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Iron Ore Production</u>	<u>Raw Steel Production</u>
1950	166,830	111,664
1951	194,314	127,300
1952	218,492	140,532
1953	240,542	147,090
1954	249,540	158,488
1955	291,669	180,564
1956	325,253	197,434
1957	358,992	209,785
1958	370,755	213,045
1959	416,535	243,064
1960	476,159	282,308
1961	474,068	289,546
1962	479,226	299,672
1963	494,520	317,739
1964	547,247	354,924
1965	586,597	374,538
1966	599,930	389,899
1967	592,078	416,787
1968	600,756	452,538
1969	628,611	491,738
1970	700,495	523,720
1971	728,928	519,422
1972	705,469	558,310
1973	854,463	616,400
1974		

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

LEAD - U. S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Industrial Consumption*</u>	<u>Total Metal Consumption**</u>
1950		1,237,981
1951		1,184,793
1952		1,130,795
1953		1,201,604
1954		1,094,871
1955		1,212,644
1956		1,209,717
1957		1,138,115
1958		986,387
1959		1,091,149
1960		1,021,172
1961		1,027,216
1962		1,109,635
1963		1,163,358
1964	1,121,000	1,202,138
1965	1,194,000	1,241,482
1966	1,268,000	1,323,877
1967	1,226,000	1,260,516
1968	1,379,000	1,328,790
1969	1,408,000	1,389,358
1970	1,335,000	1,360,552
1971	1,435,000	1,431,514
1972	1,452,000	1,485,254
1973	1,598,000	1,541,209
1974		1,500,000***

Sources: *U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

**U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

***U. S. Bureau of Mines, Commodity Data Summaries

LEAD - U. S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Gasoline additives	2911	262	271	279	264	279	274
Transportation	3691, 37	453	492	548	625	668	700
Construction	344	117	119	121	100	88	86
Paints	2851	110	102	99	81	89	109
Ammunition	848	82	79	73	88	85	81
Electrical	3356, 3357, 3691	87	96	87	131	128	135
Other		<u>268</u>	<u>249</u>	<u>128</u>	<u>146</u>	<u>115</u>	<u>213</u>
TOTAL		1,379	1,408	1,335	1,435	1,452	1,598

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

LEAD - U. S. CONSUMPTION BY MAJOR PRODUCT
(Short Tons)

<u>P r o d u c t</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Metal Products				
Ammunition	72,726	87,567	84,699	81,479
Bearing Metals	16,328	16,285	15,915	15,657
Brass and Bronze	18,927	20,044	19,805	22,735
Cable Covering	50,772	52,920	45,930	43,005
Calking Lead	34,608	29,993	22,483	20,057
Casting Metals	7,498	7,281	7,139	7,220
Collapsible Tubes	10,913	10,041	4,020	2,860
Foil	5,521	4,417	4,592	4,985
Pipes, Traps, Bands	17,888	18,174	17,780	21,291
Sheet Lead	21,050	27,607	23,667	23,394
Solder	69,707	70,013	71,289	71,770
Storage Batteries	593,453	679,803	726,592	769,447
Terne Metal	1,038	1,409	504	2,658
Type Metal	<u>24,476</u>	<u>20,812</u>	<u>19,944</u>	<u>21,922</u>
TOTAL	944,905	1,046,366	1,064,359	1,108,480
Pigments	98,736	81,258	89,214	108,766
Chemicals	279,128	264,641	279,189	275,354
Miscellaneous Uses	<u>37,783</u>	<u>39,159</u>	<u>52,492</u>	<u>48,609</u>
TOTAL	1,360,552	1,431,514	1,485,254	1,541,209

Source: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

LEAD - U. S. SUPPLY
(short tons)

Year	Mine Production	% of Total Supply	Old Scrap	%	Total Scrap	Imports for Consumption ¹	%	Net Imports ¹	%	Total Supply ²
1950	430,827	31.3	427,520	31.0	482,275	521,796	37.9	519,061	37.7	1,377,408
1951	388,164	36.0	441,658	41.0	518,110	248,797	23.1	247,516	23.0	1,077,338
1952	390,162	27.6	411,831	29.1	471,294	615,770	43.5	614,008	43.3	1,416,001
1953	342,644	26.0	428,750	32.5	486,737	546,839	41.5	546,036	41.5	1,317,430
1954	325,419	26.7	424,987	34.8	480,925	470,778	38.6	470,182	38.5	1,220,588
1955	338,025	28.0	449,186	37.1	502,051	422,458	34.9	422,055	34.9	1,209,266
1956	352,826	28.1	445,516	35.5	506,755	461,191	36.8	456,563	36.4	1,254,905
1957	338,216	25.5	431,883	32.5	489,229	562,266	42.3	557,927	42.0	1,328,026
1958	267,377	22.3	343,269	28.5	401,787	592,425	49.3	591,066	49.2	1,201,712
1959	255,586	24.3	392,762	37.5	451,387	402,800	38.5	400,044	38.2	1,048,392
1960	246,669	24.5	408,397	40.6	469,903	353,798	35.1	351,831	34.9	1,006,897
1961	261,921	25.2	390,538	37.6	452,792	387,288	37.3	385,155	37.2	1,037,614
1962	236,956	23.2	393,284	38.4	444,202	395,305	38.6	393,197	38.4	1,023,437
1963	253,369	24.3	427,189	41.0	493,471	362,030	34.8	360,942	34.7	1,041,500
1964	286,010	26.2	469,661	43.0	541,582	347,773	31.8	337,598	30.8	1,093,269
1965	301,147	26.6	495,734	43.7	575,819	343,840	30.4	336,029	29.7	1,132,910
1966	327,368	28.2	485,329	41.9	572,834	352,485	30.4	347,050	29.9	1,159,747
1967	316,931	24.4	476,865	36.8	553,772	509,533	39.3	502,997	38.8	1,296,793
1968	359,156	28.5	471,267	37.5	550,879	435,384	34.6	427,103	34.0	1,257,526
1969	509,013	35.9	515,937	36.4	603,905	396,670	28.0	391,702	27.7	1,416,652
1970	571,767	42.1	506,186	37.2	597,390	288,919	21.3	281,172	20.7	1,359,125
1971	578,550	43.1	489,781	36.5	596,797	281,033	20.9	275,108	20.4	1,343,439
1972	618,915	44.0	497,712	35.4	616,597	298,314	21.2	288,938	20.6	1,406,565
1973	603,024	44.8	538,590	40.0	654,286	272,492	20.2	205,916	15.2	1,347,530

¹ excludes scrap

² total supply = mine production + old scrap + net imports

Source: U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

LEAD - MAJOR U. S. IMPORT SOURCES¹
(Short Tons)

C o u n t r y	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
	Amount	% of Total U. S. Imports	Amount	%	Amount	%	Amount	%
Canada	105,090	29.4	78,806	30.1	114,049	33.2	79,073	28.2
Australia	81,065	22.7	54,937	21.0	56,360	16.4	67,278	24.0
Peru	73,810	20.7	54,765	20.9	77,080	22.4	66,805	23.8
Mexico	38,978	10.9	29,805	11.4	36,694	10.7	22,179	7.9
Honduras	15,054	4.2	15,121	5.6	17,790	5.2	20,254	7.2
TOTAL IMPORTS	357,325		261,585		343,904		280,579	

¹excludes scrap

Source: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

LEAD - MAJOR U. S. IMPORT SOURCE INFORMATION

(1970 - 1973)

<u>C o u n t r y</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U. S.</u>	<u>% of U. S. Demand Supplied</u>	<u>% of World Reserves*</u>
Canada	10.9	22.7	6.5	10.0
Australia	12.2	14.1	4.5	11.9
Peru	5.2	34.8	4.7	2.2
Mexico	4.9	17.2	2.2	2.8
Honduras	.5	83.8	1.2	.2
(United States)	(15.7)			(36.9)

Sources: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

*U. S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973.

U. S. Bureau of Mines, Commodity Data Summaries, 1975.

LEAD - RESERVES AND RESOURCES

Domestic

Reserves¹ (measured and indicated) ~ 59,000,000 short tons

Resources - not available

Foreign

Reserves² (measured and indicated) ~ 101,000,000 short tons

Resources - potentially productive world resources including lead bearing manganese nodules are estimated to contain approximately 1.5 billion tons of lead.

¹At 1973 industry demand levels, this is a forward reserve of 36.9 years.

²At 1973 mine production levels, this is a forward reserve of 31.1 years.

Source: U. S. Bureau of Mines, Commodity Data Summaries, 1975.

LEAD - FOREIGN PRODUCTION AND CONSUMPTION

(short tons)

<u>Year</u>	<u>Mine Production</u>	<u>Primary Consumption</u>
1950	1,419,173	
1951	1,501,836	
1952	1,639,838	
1953	1,757,356	
1954	1,944,581	
1955	2,091,975	
1956	2,137,174	
1957	2,301,784	
1958	2,322,623	
1959	2,314,414	
1960	2,373,331	
1961	2,378,079	
1962	2,528,044	
1963	2,521,898	
1964	2,493,172	
1965	2,665,361	
1966	2,811,411	
1967	2,842,412	
1968	2,955,836	2,550,000*
1969	3,047,048	
1970	3,169,779	
1971	3,193,329	
1972	3,229,667	
1973	3,249,166	

Sources: U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

*U. S. Bureau of Mines, Mineral Facts and Problems, 1970.

MANGANESE - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Industrial Consumption</u>
1964	1,216
1965	1,373
1966	1,353
1967	1,207
1968	1,150
1969	1,317
1970	1,327
1971	1,170
1972	1,366
1973	1,554

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

MANGANESE - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Pounds)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Construction	344	276	268	260	252	236	325
Transportation	37	273	253	226	261	239	340
Machinery	35	198	185	176	175	171	229
Cans and containers	341	72	62	73	71	58	72
Appliances and equipment	363	53	51	51	51	51	68
Oil and gas industries	13, 461, 492	52	43	42	46	44	63
Chemicals	28	59	37	37	35	50	54
Batteries	3692	15	20	20	19	18	18
Other 1/		152	398	442	260	499	385
Total Primary Demand		1,150	1,317	1,327	1,170	1,366	1,554

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

¹Includes processing losses.

MANGANESE - U.S. SUPPLY

(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	79	6.5	1,154	94.6	1,141	93.5	1,220
1965	83	5.5	1,432	95.3	1,420	94.5	1,503
1966	88	5.8	1,444	94.9	1,434	94.2	1,522
1967	73	5.9	1,171	95.0	1,160	94.1	1,233
1968	48	4.4	1,053	97.0	1,038	95.6	1,086
1969	93	7.0	1,249	94.1	1,235	93.0	1,328
1970	66	6.0	1,085	98.6	1,035	94.0	1,101
1971	38	3.3	1,150	99.3	1,120	96.7	1,158
1972	29	2.6	1,098	99.1	1,079	97.4	1,108
1973	31	3.0	1,058	100.9	1,018	97.0	1,049

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

MANGANESE - MAJOR U.S. IMPORT SOURCE
(Thousand Short Tons)

1 9 6 8*			1 9 7 3		
<u>Country</u>	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>% of Total Imports</u>	
Brazil	255	24.2	303	28.6	
Gabon	261	24.8	196	18.5	
Republic of South Africa	91	8.6	167	15.8	
France	39	3.7	107	10.1	
Australia	37	3.5	61	5.8	
Mexico	-		44	4.1	
Zaire	60	5.7	36	3.4	
Total U.S. Imports	1,053		1,058		

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

*U.S. Bureau of Mines, Mineral Facts and Problems, 1970.

MANGANESE - MAJOR U.S. IMPORT SOURCE INFORMATION
(1973)

<u>Country</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Reserves*</u>
Brazil	10.6	26.4	19.4	1.6
Gabon	9.9	18.5	12.6	3.5
Republic of South Africa	17.7	8.9	10.8	36.7
France	-	-	6.9	
Australia	7.5	7.6	3.9	5.5
Mexico	1.3	28.5	2.7	.3
Zaire	1.7	20.0	2.3	.1
(U.S.)	(.3)		(2.0)	-

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

*U.S. Bureau of Mines, Commodity Data Summaries, 1975.

*U.S. Geological Survey, United States Mineral Resources, 1973.

MANGANESE - RESERVES AND RESOURCES

D O M E S T I C

Reserves - none
Conditional Resources - 196×10^6 short tons
Hypothetical Resources - not known

F O R E I G N

Reserves^{1,*} - $6,000 \times 10^6$ short tons
Conditional Resources - $7,500 \times 10^6$ short tons
Hypothetical Resources - $10,000 \times 10^6$ short tons

Sources: U.S. Geological Survey, United States Mineral Resources, (Professional Paper 820), 1973.

*U.S. Bureau of Mines, Commodity Data Summaries, 1975.

¹At 1973 production levels this is a forward reserve of 560 years.

MANGANESE - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Production</u>	<u>Consumption</u>
1964	7,900	
1965	8,717	
1966	8,893	
1967	8,205	
1968	8,549	7,100*
1969	9,192	
1970	8,978	
1971	9,960	
1972	9,983	
1973	10,707	

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

*U.S. Bureau of Mines, Mineral Facts and Problems, 1970.

NATURAL GAS - U.S. CONSUMPTION
(Billion Cubic Feet)

<u>Year</u>	
1950	5,942
1951	7,003
1952	7,498
1953	7,870
1954	8,259
1955	8,920
1956	9,502
1957	10,064
1958	10,623
1959	11,585
1960	12,269
1961	12,750
1962	13,612
1963	14,341
1964	15,118
1965	15,598
1966	16,854
1967	17,685
1968	18,972
1969	20,388
1970	21,367
1971	22,133
1972	22,565
1973	22,687

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

Science Policy Research Division, Library of Congress,
Energy Facts, Prepared for the House Committee on
Science & Astronautics, 1973.

NATURAL GAS - U.S. CONSUMPTION BY MAJOR END USE CATEGORY

(Billions of Cubic Feet)

<u>End Use</u>	<u>Sic Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Household and Commercial		6,251	6,683	6,894	7,144	7,413	7,167
Industrial							
Food Products	20	400	440	445	446	440	450
Paper Products	26	405	445	460	485	475	480
Chemicals	28	1,180	1,250	1,300	1,400	1,350	1,550
Petroleum Refining	2911	980	1,010	1,029	1,063	1,071	1,074
Nonmetallic Productions	32	675	700	725	755	740	740
Primary Metals Industries	33	935	975	1,015	1,050	1,110	1,120
Other		4,396	4,768	4,883	5,054	5,221	5,773
Total		8,971	9,588	9,857	10,253	10,407	11,187
Oil and Gas Industries	461, 492	591	631	722	743	766	728
Electric Utilities	4911	3,144	3,486	3,894	3,993	3,979	3,605
TOTAL		18,957	20,388	21,367	22,133	22,565	22,687

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

NATURAL GAS - U.S. SUPPLY
(Billion Cubic Feet)

<u>Year</u>	<u>Domestic Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Exports</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1950	6,282	100.4	--	0	26	(-26)	(-.4)	6,256
1951	7,457	100.3	--	0	24	(-24)	(-.3)	7,433
1952	8,014	100.3	8	.1	28	(-20)	(-.3)	7,994
1953	8,397	100.3	--	0	28	(-28)	(-.3)	8,369
1954	8,743	100.3	7	.1	29	(-22)	(-.3)	8,721
1955	9,405	100.2	11	.1	31	(-21)	(-.2)	9,384
1956	10,082	100.3	10	.1	36	(-26)	(-.3)	10,056
1957	10,680	100.0	38	.4	42	(-4)	(-.1)	10,676
1958	11,030	99.1	136	1.2	39	97	.9	11,127
1959	12,046	99.1	134	1.1	18	116	.9	12,162
1960	12,771	98.9	156	1.2	11	145	1.1	12,916
1961	13,254	98.5	219	1.6	11	208	1.6	13,462
1962	13,877	97.3	402	2.8	16	386	2.7	14,263
1963	14,747	97.4	406	2.7	17	389	2.6	15,136
1964	15,562	97.3	441	2.8	17	424	2.7	15,886
1965	16,040	97.4	456	2.8	26	430	2.6	16,470
1966	17,207	97.4	480	2.7	25	455	2.6	17,662
1967	18,171	97.4	565	3.0	82	483	2.6	18,654
1968	19,322	97.2	653	3.3	94	559	2.8	19,881
1969	20,698	96.8	727	3.4	51	676	3.2	21,374
1970	21,921	96.7	821	3.6	70	751	3.3	22,672
1971	22,493	96.3	935	4.0	80	855	3.6	23,348
1972	22,532	96.0	1,019	4.3	78	941	4.0	23,473
1973	22,648	96.0	1,033	4.4	77	956	4.1	23,604

NATURAL GAS - MAJOR U.S. IMPORT SOURCE
(Billions of Cubic Feet)

<u>C o u n t r y</u>	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
	<u>Amount</u>	<u>% of Total Supply</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	778.7	94.9	910.9	97.5	1,009.1	99.0	1,028.0	99.5
Mexico	41.3	5.0	20.7	2.2	8.0	.8	2.0	.2
TOTAL IMPORTS	820.8		934.6		1,019.5		1,033.0	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

NATURAL GAS - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

<u>C o u n t r y</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World[*] Reserves</u>
Canada	7.0	32.2	4.2	2.4
Mexico	1.2	3.6	.1	--
(U.S.)	(54.1)			(11.4)
(U.S.S.R.)	(18.5)			(30.0)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

^{*}U.S. Bureau of Mines, Commodity Data Summaries, 1975

NATURAL GAS - RESERVES AND RESOURCES*

D o m e s t i c

Reserves¹ - 250×10^{15} cubic feet

Resources* - $546 - 3,086 \times 10^{15}$ cubic feet

F o r e i g n

Reserves² - $2,150 \times 10^{15}$ cubic feet

Resources - Estimates of world resources range from 10 to 15⁺
times current reserves.

¹At 1973 consumption levels this is a forward reserve of 10.9 years.

²At 1973 production levels this is a forward reserve of 96.6 years.

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975

* L. G. Weeks, "Fuel Reserves of the Future", American Association of Petroleum Geologists Bulletin, vol. #2, 1958.

* U.S. Geological Survey, Energy Resources of the United States, (Circular 650), 1972.

NATURAL GAS - FOREIGN PRODUCTION AND CONSUMPTION
(Billions of Cubic Feet)

<u>Year</u>	<u>Production</u>
1960	4,146
1961	5,134
1962	6,209
1963	6,352
1964	8,370
1965	9,283
1966	10,493
1967	10,213
1968	11,706
1969	13,317
1970	15,900
1971	17,785
1972	19,949
1973	22,265

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

NICKEL - U. S. CONSUMPTION
(short tons)

<u>Year</u>	<u>Industrial Consumption*</u>	<u>Primary Consumption**</u>
1950		99,989
51		86,683
52		101,397
53		105,681
54		94,733
55		110,100
56		127,578
57		122,466
58		79,017
59		112,661
1960		108,159
61		118,515
62		118,677
63		124,478
64	183,000	146,920
65	241,800	172,084
66	291,900	187,833
67	234,700	173,798
68	194,500	159,306
69	220,800	141,737
1970	192,300	155,719
71	215,000	128,802
72	245,600	159,286
73	259,000	197,723

Sources: *U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

**U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

NICKEL - U. S. CONSUMPTION BY MAJOR END-USE CATEGORY
(thousand short tons)

<u>End-Use</u>	<u>SiC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Chemicals	28	21.9	34.0	28.9	32.1	36.8	38.9
Petroleum	2911	11.9	17.0	15.4	19.4	22.2	23.3
Fabricated metal products	34	24.5	18.4	18.4	22.0	24.6	26.0
Transportation	37						
Aircraft		24.2	14.8	11.6	15.1	16.9	18.1
Motor vehicles and equipment		22.0	23.3	23.1	23.6	27.5	28.5
Ship and boat building and repairs		9.1	8.5	5.7	6.6	7.1	7.9
TOTAL		55.3	46.6	40.4	45.3	51.5	54.5
Electrical	362	20.2	29.7	24.9	27.8	31.9	33.6
Household appliances	363	18.2	13.4	12.5	14.7	17.2	18.1
Machinery	35	12.6	16.0	14.3	14.8	17.2	18.1
Construction	344	10.3	15.8	18.2	19.6	22.2	23.3
Other		19.6	29.9	19.3	19.3	22.0	23.2
TOTAL		194.5	220.8	192.3	215.0	245.6	259.0

Source: U. S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

NICKEL - U. S. SUPPLY
(short tons)

Year	Mine Production	% of Total Supply	Old Scrap	%	Total Scrap	Imports	%	Net Imports	%	Total Supply ¹
1954	2,006	1.6	4,610	3.7	8,605	132,000	106.1	117,755	94.6	124,371
55	4,411	3.3	7,520	5.6	11,540	142,000	106.5	121,399	91.1	133,330
56	7,392	6.5	8,516	7.5	14,860	143,000	125.0	98,476	86.0	114,384
57	12,900	8.8	6,718	4.6	12,037	140,000	95.8	126,585	86.6	146,203
58	13,490	14.4	4,088	4.4	7,411	90,000	96.2	75,968	81.2	93,546
59	13,374	11.4	5,210	4.4	9,438	112,000	95.3	98,927	84.2	117,511
1960	14,079	20.8	4,678	6.9	9,431	103,000	152.3	48,891	72.3	67,648
61	13,133	14.6	5,506	6.1	10,688	127,000	140.9	71,507	79.3	90,146
62	13,110	11.5	5,377	4.7	11,108	123,000	108.0	95,359	83.8	113,846
63	13,394	15.9	12,794	15.2	18,996	119,000	141.2	58,073	68.9	84,261
64	15,420	16.5	17,415	18.7	23,114	129,000	138.2	60,498	64.8	93,333
65	16,188	9.5	12,415	7.3	19,407	163,000	95.5	142,065	83.2	170,668
66	15,036	10.3	16,580	11.3	26,777	141,000	96.4	114,613	78.4	146,229
67	15,287	11.0	12,400	8.9	20,731	143,000	102.8	111,463	80.1	139,150
68	17,294	12.3	8,900	6.3	14,061	147,950	105.3	114,269	81.4	140,463
69	17,056	13.7	12,489	10.1	18,775	129,332	104.2	94,574	76.2	124,119
1970	15,933	10.0	16,198	10.1	23,159	156,252	97.7	127,796	79.9	159,927
71	17,036	11.0	21,767	14.1	29,657	142,183	91.8	116,040	74.9	154,843
72	16,864	8.5	30,440	15.3	35,926	173,870	87.2	152,199	76.2	199,503
73	18,272	8.2	26,694	11.9	33,295	191,073	85.3	179,003	79.9	223,969

Source: U. S. Bureau of Mines, Minerals Yearbook, 1950-1973.

¹Total supply = mine production + old scrap + net imports

NICKEL - MAJOR U.S. IMPORT SOURCES
(Short Tons - Gross Weight)

<u>Country</u>	<u>1970</u>		<u>1971</u>		<u>1972</u>		<u>1973</u>	
	<u>Amount</u>	<u>% of Total U.S. Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	142,152	88.2	123,214	86.7	132,892	76.4	129,716	67.9
Norway	10,825	6.7	11,110	7.8	17,295	9.9	14,563	7.6
Rep. of S. Africa	5,020	3.1	4,041	2.8	3,006	1.7	3,367	1.8
United Kingdom	1,941	1.2	1,854	1.3	6,803	3.9	11,007	5.8
Total Imports	161,263		142,183		173,870		191,073	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

NICKEL - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

<u>Country</u>	<u>% of World Mine Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Identified Resources</u>
Canada	40.2	46.8	57.9	19.7
Norway	.1 (6.7) ¹	29.4 ¹	5.9	< 1.0
Rep. of S. Africa	1.8	30.2	1.7	2.2
United Kingdom	- (5.8) ¹	13.6 ¹	2.4	-
(U.S.)	(2.4)			(16.8)
(New Caledonia)	(15.5)			(17.3)

¹Smelter production

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

U.S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973.

NICKEL - RESERVES AND RESOURCES

D o m e s t i c

Reserves ¹	200,000 tons
Resources	> 14,000,000 tons

F o r e i g n

Reserves ²	48,800,000 tons
Resources	Very large

¹ At 1973 primary consumption levels, this is a forward reserve of 1.01 years.

² At 1973 mine production levels, this is a forward reserve of 69 years.

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975.

NICKEL - FOREIGN PRODUCTION AND CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Primary Consumption</u>
1950	162,000	
1951	145,000	
1952	161,000	
1953	217,989	
1954	235,994	
1955	259,589	
1956	277,608	
1957	302,100	
1958	233,510	
1959	300,626	
1960	348,921	
1961	384,867	
1962	380,890	
1963	360,592	
1964	393,509	
1965	452,158	
1966	439,421	
1967	479,548	
1968	530,666	307,500*
1969	519,552	
1970	676,777	
1971	684,991	
1972	666,258	
1973	707,742	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

* U.S. Bureau of Mines, Mineral Facts and Problems, 1970.

PETROLEUM - U.S. CONSUMPTION
(Millions of Barrels)

<u>Year</u>	
1950	2,486.4
1951	2,723.9
1952	2,822.6
1953	2,921.9
1954	2,962.1
1955	3,222.0
1956	3,379.6
1957	3,425.8
1958	3,415.8
1959	3,526.7
1960	3,609.7
1961	3,642.8
1962	3,797.0
1963	3,927.1
1964	4,034.2
1965	4,202.0
1966	4,410.8
1967	4,584.5
1968	4,901.8
1969	5,159.9
1970	5,364.5
1971	5,552.6
1972	5,990.2
1973	6,297.5

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

PETROLEUM - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Millions of Barrels)

<u>End-Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Household & Commercial		1,069.5	1,099.6	1,128.4	1,126.5	1,185.9	1,232.7
Industrial <u>1/</u>							
Food Products	20	20.0	21.0	20.0	21.0	22.0	23.0
Paper Products	26	35.0	40.0	45.0	50.0	55.0	60.0
Chemicals	28	363.5	385.3	387.2	390.7	442.8	480.0
Petroleum Refining	29	251.5	261.7	262.6	254.1	285.4	300.0
Nonmetallic Products	32	14.0	15.0	15.5	16.5	18.0	20.0
Primary Metal Industries	33	59.0	60.0	60.0	62.0	65.0	69.0
Other Manufacturing Industries		130.0	140.0	150.1	154.8	160.0	168.3
Total		873.0	923.0	940.4	949.1	1,048.2	1,120.3
Transportation		2,728.0	2,836.4	2,923.8	3,032.1	3,221.2	3,346.6
Electric Utilities		188.0	259.8	333.8	407.1	503.7	556.9
Other		43.3	41.1	38.1	37.8	31.2	41.0
U.S. Demand		4,901.8	5,159.9	5,364.5	5,552.6	5,990.2	6,297.5
<u>1/ Estimated</u>							

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

PETROLEUM - U.S. SUPPLY

(Millions of Barrels)

Domestic Production										
Year	Crude Oil	% of Total Supply	Natural Gas Liquids	%	Imports	%	Exports	Net Imports	%	Total Supply
1950	1,973.6	83.8	182.0	7.7	310.3	13.2	111.3	199.0	8.5	2,354.6
1951	2,247.7	86.2	204.8	7.9	308.2	11.8	154.1	154.1	5.9	2,606.6
1952	2,289.8	84.7	223.5	8.3	348.5	12.9	158.2	190.3	7.0	2,703.6
1953	2,357.1	83.4	238.6	8.4	377.5	13.4	146.6	230.9	8.2	2,826.6
1954	2,315.0	82.1	252.1	8.9	384.0	13.6	129.7	254.3	9.0	2,821.4
1955	2,484.4	80.5	281.4	9.1	455.5	14.8	134.2	321.3	4.4	3,087.1
1956	2,617.3	79.8	292.7	8.9	525.6	16.0	157.4	368.2	11.2	3,278.2
1957	2,616.9	79.7	298.0	9.1	574.6	17.5	207.2	367.4	11.1	3,282.3
1958	2,449.0	75.0	294.8	9.0	620.6	19.0	100.6	520.0	16.0	3,263.8
1959	2,574.6	74.3	320.8	9.3	649.5	18.7	77.1	572.4	16.4	3,467.6
1960	2,574.9	73.4	340.2	9.7	664.1	19.0	73.9	590.2	16.9	3,505.3
1961	2,621.8	72.4	361.7	10.0	699.7	19.3	63.6	636.1	17.6	3,619.6
1962	2,676.2	71.4	372.7	10.0	759.8	20.3	61.4	698.4	18.5	3,747.3
1963	2,752.7	71.5	400.0	10.4	774.8	20.1	75.9	698.9	18.1	3,852.5
1964	2,786.8	70.3	422.5	10.7	826.7	20.9	73.9	752.8	19.0	3,962.1
1965	2,848.5	69.1	441.6	10.7	900.8	21.9	68.3	832.5	20.2	4,122.6
1966	3,027.8	69.4	468.6	10.7	939.2	21.5	72.4	866.8	19.9	4,363.2
1967	3,215.7	70.8	514.5	11.3	926.0	20.4	112.1	813.9	17.9	4,544.1
1968	3,329.0	68.9	550.3	11.4	1,038.4	21.5	85.2	953.2	19.7	4,832.5
1969	3,371.8	67.1	580.2	11.6	1,155.6	23.0	84.5	1,071.1	21.3	5,023.1
1970	3,517.5	66.7	605.9	11.5	1,247.4	23.6	94.2	1,153.2	21.8	5,276.1
1971	3,453.9	63.7	617.8	11.4	1,430.6	26.4	81.7	1,348.9	24.9	5,420.6
1972	3,455.4	60.1	638.2	11.1	1,735.3	30.2	81.4	1,653.9	28.8	5,747.5
1973	3,360.9	54.4	634.3	10.3	2,263.5	36.7	84.2	2,179.3	35.3	6,174.5

PETROLEUM - MAJOR U.S. IMPORT SOURCES

(Millions of Barrels)

	1 9 7 0		1 9 7 1		1 9 7 2		1 9 7 3	
<u>C o u n t r y</u>	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	279.7	22.4	312.8	21.8	405.6	23.4	479.2	21.1
Venezuela	361.2	28.9	372.3	26.0	351.3	20.2	410.5	18.1
Netherlands Antilles	174.8	14.0	157.6	11.0	155.2	8.9	209.4	9.3
Virgin Islands	68.9	5.5	99.5	6.9	120.9	7.0	120.2	5.3
Trinidad & Tobago	79.1	6.3	66.8	4.7	82.5	4.8	91.5	4.0
Bahamas	11.5	.9	54.8	3.8	63.5	3.7	62.3	2.8
Saudi Arabia	6.7	.5	46.8	3.3	69.4	4.0	177.9	7.9
Iran	14.0	1.1	40.8	2.9	51.9	3.0	81.3	3.6
Indonesia	25.7	2.1	40.6	2.8	60.2	3.5	77.6	3.4
Nigeria	18.1	1.5	37.3	2.6	91.8	5.3	167.5	7.4
Puerto Rico	30.2	2.4	34.8	2.4	37.2	2.1	36.2	1.6
Libya	17.3	1.4	21.1	1.5	44.9	2.6	60.0	2.7
TOTAL IMPORTS	1,248.1		1,432.9		1,735.3		2,263.5	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

PETROLEUM - MAJOR DIRECT IMPORT SOURCE INFORMATION
(1970-1973)

<u>C.o.u n t r y</u>	<u>% of World Production</u>	<u>% of Country's Production Exported to the U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World[*] Reserves</u>
Canada	2.9	68.3	6.4	1.6
Venezuela	6.9	29.6	6.4	2.2
Netherland Antilles	--	--	3.0	--
Virgin Islands	--	--	1.8	--
Trinidad & Tobago	.3	151.8	1.3	.2
Bahamas	--	--	1.4	--
Saudi Arabia	11.2	3.7	.8	29.9
Iran	9.6	2.7	1.3	8.8
Indonesia	2.1	13.4	.9	1.6
Nigeria	3.2	13.3	1.4	1.9
Puerto Rico	--	--	.6	--
Libya	5.2	3.7	.6	4.0
(U.S.)	(18.8)			(7.2)

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

* U.S. Geological Survey, Summary Petroleum and Selected Mineral Statistics for 120 Countries, Including Offshore Areas (Professional Paper 817), 1973.

PETROLEUM - RESERVES AND RESOURCES

Domestic

Reserves¹ - 35.3×10^9 Barrels

Resources (ultimately recoverable)* - $242-960 \times 10^9$ Barrels

Foreign

Reserves² - 591×10^9 Barrels

Resources - Total crude petroleum resources have not been determined with much precision. Recent estimates of potentially recoverable world crude petroleum resources vary from 2 - 4.5 trillion barrels.

¹At 1973 consumption levels this is a forward reserve of 5.6 years.

²At 1973 production levels this is a forward reserve of 34.4 years.

Sources: U.S. Bureau of Mines, Commodity Data Summaries, 1975

*M. K. Hubbert, "Energy Resources" in Resources and Man, 1969.

U.S. Geological Survey, Energy Resources of the United States (Circular 650), 1972.

CRUDE PETROLEUM - FOREIGN PRODUCTION AND CONSUMPTION
(Millions of Barrels)

<u>Year</u>	<u>Production</u>	<u>Consumption</u> [*]
1950	1,829.4	
1951	2,035.0	
1952	2,214.9	
1953	2,429.9	
1954	2,691.2	
1955	3,141.3	
1956	3,501.3	
1957	3,819.2	
1958	4,158.8	
1959	4,558.8	
1960	5,099.6	
1961	5,564.5	
1962	6,206.0	5,301.6
1963	6,784.8	5,960.5
1964	7,524.3	6,573.7
1965	8,210.0	7,212.4
1966	8,992.2	7,904.1
1967	9,673.6	8,650.5
1968	10,775.3	9,521.0
1969	11,843.1	10,564.9
1970	13,193.3	11,168.7
1971	14,208.9	12,526.4
1972	15,142.4	13,401.0
1973	17,200.0	n.a.

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

* Science Policy Research Division, Library of Congress,
Energy Facts, Prepared for the House Committee on Science
& Astronautics, 1973.

PHOSPHATE ROCK - U.S. CONSUMPTION
(thousand short tons)

<u>Year</u>	<u>Apparent Consumption</u>
1950	9,622
1951	10,653
1952	11,236
1953	11,825
1954	12,193
1955	12,454
1956	12,920
1957	13,101
1958	13,632
1959	14,736
1960	14,938
1961	15,745
1962	17,091
1963	17,330
1964	18,532
1965	21,866
1966	27,382
1967	27,902
1968	25,336
1969	25,534
1970	27,163
1971	27,788
1972	29,535
1973	31,233

Source: U.S. Bureau of Mines, Minerals
Yearbook, 1950-1973.

PHOSPHATE ROCK - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(thousand short tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Fertilizer	2874	20,269	20,428	21,730	22,230	23,629	24,799
Detergents	2841	2,028	2,043	2,172	2,222	2,363	2,312
Animal feeds	2048	1,013	1,021	1,087	1,112	1,181	1,374
Food products	20	1,013	1,021	1,087	1,112	1,181	1,374
Other		1,013	1,021	1,087	1,112	1,181	1,374
Total		25,336	25,534	27,163	27,788	29,535	31,233

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

PHOSPHATE ROCK - U.S. SUPPLY
(thousand short tons)

Year	Mine Production (Sold or used by producers)	% of Total Supply	Imports	%	Net Imports	%	Total Supply
1950	11,485	119.5	98	1.0	(- 1,874)	(-19.5)	9,611
1951	12,426	116.7	104	1.0	(- 1,774)	(-16.7)	10,652
1952	12,683	112.9	123	1.1	(- 1,447)	(-12.9)	11,236
1953	14,020	118.6	113	1.0	(- 2,195)	(-18.6)	11,825
1954	14,609	119.8	137	1.1	(- 2,416)	(-19.8)	12,193
1955	14,769	118.6	131	1.1	(- 2,314)	(-18.6)	12,455
1956	15,804	122.3	123	1.0	(- 2,884)	(-22.3)	12,920
1957	16,349	124.8	123	.9	(- 3,248)	(-24.8)	13,101
1958	16,528	121.3	121	.9	(- 2,899)	(-21.3)	13,629
1959	17,948	122.2	157	1.1	(- 3,257)	(-22.2)	14,691
1960	19,266	129.0	145	1.0	(- 4,329)	(-29.0)	14,937
1961	19,983	126.9	150	1.0	(- 4,238)	(-26.9)	15,745
1962	21,347	124.9	150	.9	(- 4,256)	(-24.9)	17,091
1963	22,238	128.4	180	1.0	(- 4,913)	(-28.4)	17,325
1964	25,715	131.8	175	.9	(- 6,199)	(-31.8)	19,516
1965	29,482	132.2	148	.7	(- 7,175)	(-32.2)	22,307
1966	39,044	130.3	178	.6	(- 9,070)	(-30.3)	29,974
1967	39,770	133.3	139	.5	(- 9,933)	(-33.3)	29,837
1968	41,251	140.9	116	.4	(-11,983)	(-40.9)	29,268
1969	37,725	142.2	140	.5	(-11,196)	(-42.2)	26,529
1970	38,739	142.8	136	.5	(-11,602)	(-42.8)	27,137
1971	38,886	147.4	84	.3	(-12,503)	(-47.4)	26,383
1972	40,831	153.4	55	.2	(-14,220)	(-53.4)	26,611
1973	42,137	148.8	65	.2	(-13,810)	(-48.8)	28,327

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973.

PHOSPHATE ROCK - INFORMATION ON MAJOR PRODUCERS

<u>Country</u>	<u>% of World Production (1970-1973)</u>	<u>% of World Reserves (1974)</u>
United States	40.8	21.4
U.S.S.R.	22.7	28.6
Morocco	15.4	~12.0

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973.

U.S. Bureau of Mines, Commodity Data Summaries, 1975.

PHOSPHATE ROCK - RESERVES AND RESOURCES

DOMESTIC

Reserves ¹	3×10^9 short tons
Resources	Very Large

FOREIGN

Reserves ²	11×10^9 short tons
Resources	Very Large

¹At 1973 consumption levels, this is a forward reserve of 96,000 years.

²At 1973 production levels, this is a forward reserve of 167,000 years.

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975.

PHOSPHATE ROCK - FOREIGN PRODUCTION AND CONSUMPTION
(short tons)

<u>Year</u>	<u>Mine Production</u>
1951	15,036
1952	15,607
1953	15,685
1954	18,087
1955	19,841
1956	21,205
1957	20,904
1958	22,659
1959	26,502
1960	26,493
1961	29,368
1962	40,592
1963	31,515
1964	37,004
1965	40,816
1966	44,150
1967	46,144
1968	51,326
1969	52,873
1970	54,896
1971	53,622
1972	58,150
1973	65,923

Source: U.S. Bureau of Mines, Minerals Yearbook.

SILICON - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Industrial Consumption</u>
1964	393
1965	424
1966	433
1967	474
1968	517
1969	477
1970	531
1971	451
1972	561
1973	656

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975.

SILICON - U.S. CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

End Use	SIC Code	1968	1969	1970	1971	1972	1973
Transportation	37	140	129	143	122	152	177
Construction	344	114	105	117	99	123	144
Machinery	35	96	89	101	86	107	125
Electrical	3612, 3621	44	40	43	36	45	52
Oil and gas industries	13, 461, 492	20	18	21	18	22	26
Appliances and equipment	363	22	20	21	18	22	26
Chemicals	281	26	22	27	22	28	33
Other		55	54	58	50	62	73
TOTAL		517	477	531	451	561	656

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

SILICON - U.S. SUPPLY
(Thousand Short Tons)

<u>Year</u>	<u>Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>Total Supply</u>
1964	390	100.0	3	0.1	(-1)	0	389
1965	423	99.5	5	.1	2	.5	425
1966	418	97.9	13	3.4	9	2.1	427
1967	498	98.6	15	3.0	7	1.4	505
1968	503	100.4	11	2.2	(-2)	(-.4)	501
1969	471	97.3	17	3.5	13	2.7	484
1970	530	102.3	10	1.9	(-12)	(-2.3)	518
1971	448	100.0	13	2.9	0	0	448
1972	535	96.4	27	4.9	20	3.6	555
1973	578	91.3	71	11.2	55	8.7	633

Sources: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

U.S. Bureau of Mines, Minerals Yearbook, 1964-1973

SILICON - MAJOR U.S. IMPORT SOURCE
(Short Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Norway	490	4.7	2,244	17.7	9,306	34.0	31,971	44.8
Sweden	--	--	2,307	18.2	3,742	13.7	11,656	16.3
France	2,304	22.0	2,370	18.6	4,210	15.4	7,553	10.6
Canada	5,749	54.8	1,814	14.3	2,539	9.3	6,235	7.3
TOTAL IMPORTS	10,495		12,714		27,379		71,420	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

SILICON - MAJOR U.S. IMPORT SOURCE INFORMATION
(1973)

Country	% of World Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves
Norway	10.0	16.3	4.9	N.A.
Sweden	2.0	30.0	1.8	
France	5.3	7.8	1.2	
Canada	4.3	7.1	.9	
(United States)	(29.5)			
(U.S.S.R.)	(27.1)			

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

SILVER - U.S. CONSUMPTION
(Million Troy Ounces)

<u>Year</u>	<u>Industrial Consumption</u> ¹	<u>Total Consumption</u>	<u>Consumption of Primary Materials</u> ²
1950	110.00	154.60 ^x	145.91
1951	105.00	154.40 ^x	114.37
1952	96.50	152.30 ^x	112.97
1953	106.00	147.80 ^x	118.05
1954	86.00	138.20 ^x	126.15
1955	101.40	108.20 ^x	116.82
1956	100.00	131.20 ^x	196.05
1957	95.40	147.40	233.98
1958	85.50	123.70	197.35
1959	101.00	142.40	91.10
1960	102.00	148.00	64.84
1961	105.50	161.40	45.22
1962	110.40	187.77	100.10
1963	110.00	221.49	62.81
1964	123.00	326.00	-21.40
1965	137.00	457.32	54.85
1966	183.70	237.50	21.16
1967	171.03	214.30	17.09
1968	145.29	182.13	-22.32
1969	141.54	160.95	24.88
1970	128.40	129.11	79.70
1971	129.15	131.62	87.30
1972	151.06	153.35	72.98
1973	195.94	196.86	157.30
1974	177.70 ^{xx}	178.40 ^{xx}	149.20

¹Excludes coinage

Sources: U.S. Bureau of Mines, Minerals Yearbook

^{xx}U.S. Bureau of Mines, Commodity Data Summaries, 1975

^xAnnual Report of the Director of the Mint

²Consumption of primary materials = U.S. mine production + net imports

SILVER - U.S. SUPPLY
(Million Troy Ounces)

Year	Mine Production (%)		Old Scrap (%)		Total Scrap	Imports ¹ (%)		Exports ¹	Net Imports (%)	Total Supply ²
1950	42.46	22.2			45.3	108.05	56.5	4.60	103.45	191.21
1951	39.76	24.7			46.7	81.00	50.3	6.39	74.61	161.07
1952	39.45	28.6			25.0	75.52	54.7	2.00	73.52	137.97
1953	37.57	27.3			19.4	81.50	59.3	1.02	80.48	137.45
1954	36.94	25.5			18.6	90.90	62.8	1.69	89.21	144.75
1955	37.20	26.8			22.1	84.52	60.8	4.90	79.62	138.92
1956	38.72	17.1	N.A.		30.0	162.83	72.0	5.50	157.33	226.05
1957	38.16	14.8			23.0	206.12	80.2	10.30	195.82	256.98
1958	34.11	14.6			36.0	165.97	71.1	2.73	163.24	233.35
1959	31.19	23.4			42.0	69.09	51.9	9.18	59.91	133.10
1960	30.77	27.0			49.0	60.66	53.3	26.59	34.07	113.84
1961	34.79	36.4			50.3	50.26	52.6	39.83	10.43	95.52
1962	36.80	21.6			70.4	76.36	44.8	13.06	63.30	170.50
1963	35.24	22.4			94.5	59.06	37.5	31.49	27.57	157.31
1964	36.33	66.4			76.1	51.67	94.5	109.40	-57.73	54.70
1965	39.81	34.4			61.0	54.71	47.2	39.67	15.04	115.85
1966	43.67	58.3	36.6	48.9	53.7	63.03	84.2	85.54	-22.51	74.86
1967	32.34	29.6	57.5	52.7	92.1	55.52	50.8	70.77	-15.25	109.19
1968	32.73	45.4	62.5	86.7	94.4	70.71	98.1	125.76	-55.05	72.08
1969	41.91	29.8	79.8	56.8	115.6	71.88	51.2	88.91	-17.03	140.48
1970	45.01	28.2	56.0	35.1	80.0	62.30	39.0	27.61	34.69	159.70
1971	41.56	31.0	30.1	22.5	46.6	57.96	43.3	12.22	45.74	133.90
1972	37.23	27.4	31.10	22.9	62.9	65.41	48.1	29.66	35.75	135.88
1973	37.83	16.2	34.6	14.8	75.9	130.68	56.0	11.22 ^x	119.46	233.19
1974	33.80 ^x		55.2 ^x			133.60 ^x		18.20 ^x	115.40	

¹Excludes coinage.

²Total supply = mine production - total scrap + net imports

Sources: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

SILVER - CONSUMPTION BY END USE CATEGORY
(Millions Troy Ounces)

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Silverware	3914	43.6	33.0	30.6	32.6	36.4	45.1
Jewelry and arts	3911	4.5	3.0	5.1	3.4	5.9	7.3
Photography	3861	41.6	41.4	38.0	36.1	38.2	52.0
Refrigeration	3585	8.0	10.0	8.6	9.0	10.1	12.3
Coinage		36.8	19.4	.7	2.5	2.3	.9
Appliances & equipment	363	9.5	11.2	9.4	9.0	11.3	14.0
Batteries	3692	5.8	3.8	6.3	5.6	6.0	4.2
Electrical equipment	3613	15.0	19.0	14.5	15.2	19.7	25.6
Electronic components	367	8.0	9.3	6.8	9.0	11.2	14.2
Other		<u>9.3</u>	<u>10.9</u>	<u>9.1</u>	<u>9.2</u>	<u>12.2</u>	<u>21.3</u>
TOTAL		182.1	161.0				

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

SILVER - MAJOR U.S. IMPORT SOURCES
(Thousand Troy Ounces)

<u>Country</u>	<u>1973</u>		<u>1972</u>		<u>1971</u>		<u>1970</u>	
	<u>Amount</u>	<u>% of Total U.S. Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	36,064	27.6	32,777	50.1	32,675	56.4	36,965	59.3
Peru	13,461	10.3	16,221	24.8	12,776	22.0	11,232	18.0
Mexico	55,927	42.8	7,518	11.5	3,261	5.6	5,355	8.6
Australia	2,805	2.2	2,780	4.3	1,026	1.7	3,680	5.9
Honduras	3,152	2.4	2,685	4.1	3,101	5.3	1,769	2.8

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970, 1971, 1972, 1973

SILVER - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

<u>Country</u>	<u>% of World Mine Production</u>	<u>% of Country's Production Exported to U.S.</u>	<u>% of U.S. Demand Supplied</u>	<u>% of World Reserves^x</u>
Canada	15.3	75.6	22.7	11.7
Peru	13.4	33.5	8.9	10.0
Mexico	13.0	46.3	11.8	13.3
Australia	7.8	11.0	1.7	N.A.
Honduras	1.2	75.4	1.8	N.A.

Source: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

SILVER - RESERVES AND RESOURCES
(Million Troy Ounces)

DOMESTIC

Reserves ^{xx, 1}	- 1,500
Identified Resources (Reserves)	- 2,193
Hypothetical Resources	- 3,415

FOREIGN

Reserves ^{xx, 2}	- 4,500
Identified Resources	- 5,400
Hypothetical Resources	- 11,300

Source: U.S. Geological Survey (Professional Paper 820), United States Mineral Resources, 1973

^xU.S. Bureau of Mines (Bulletin 650), Mineral Facts and Problems, 1970

^{xx}U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹At the 1974 consumption of primary material level, this amounts to a forward reserve of 10.1 years.

²At the 1974 mine production level, this amounts to a forward reserve of 17 years.

SILVER - FOREIGN PRODUCTION AND CONSUMPTION
(Million Troy Ounces)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption^{1,3}</u>	<u>Total Consumption^{3,xx}</u>
1950	160.58	47.4	67.04
1951	159.39	60.0	105.10
1952	175.57	45.6	102.60
1953	184.04	62.3	110.30
1954	178.84	74.8	105.00
1955	187.95	91.4	133.80
1956	186.82	115.9	145.80
1957	192.39	117.2	144.40
1958	202.19	105.0	146.30
1959	199.27	111.9	157.70
1960	204.44	122.6	180.50
1961	202.17	134.0	215.10
1962	208.97	148.1	197.70
1963	214.74	150.7	205.10
1964	207.22	176.2	240.30
1965	217.61	99.6	155.10
1966	223.06	171.4	226.90
1967	225.86	177.7	231.00
1968	242.53	205.5	250.80
1969	253.81	225.0	247.70
1970	255.98	228.7	248.30
1971	247.32	230.7	248.00
1972	254.16	230.9	278.20
1973	268.10	267.0	286.0
1974	265.20 ^x	243.0 ^{xxx}	275.00 ^{xxx}

Sources: ^xU.S. Bureau of Mines, Minerals Yearbook
^{xx}U.S. Bureau of Mines, Commodity Data Summaries, 1975
^{xxx}Handy & Harman, The Silver Market
^{xxx}Engineering & Mining Journal, March 1975

¹Excludes Coinage

²Free World Only

TIN - U.S. CONSUMPTION
(Long Tons)

<u>Year</u>	<u>Total Consumption</u>	<u>Primary Consumption</u>	<u>Industrial Consumption^x</u>
1950	104,464	71,191	
1951	88,169	56,884	
1952	78,418	45,323	
1953	85,640	53,959	
1954	82,891	54,427	
1955	90,483	59,828	
1956	90,324	60,470	
1957	82,507	54,429	
1958	72,587	47,998	
1959	77,373	45,833	
1960	80,560	51,530	
1961	78,250	50,288	
1962	79,085	54,602	
1963	78,303	55,209	
1964	82,847	58,543	73,079
1965	83,966	58,505	73,899
1966	85,462	60,185	75,465
1967	80,638	57,848	71,431
1968	81,961	58,859	72,893
1969	80,790	57,730	71,686
1970	73,837	52,957	65,728
1971	69,950	51,980	61,130
1972	69,201	53,501	60,241
1973	74,640	58,142	65,889

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

^xU.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

TIN - U.S. CONSUMPTION BY MAJOR END USE CATEGORY
(Long Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Cans and containers	3411	26,942	25,034	23,435	22,186	20,091	20,766
Transportation	37	8,509	8,389	7,888	7,537	8,127	9,358
Machinery	35	7,845	8,288	7,319	6,322	6,595	7,492
Electrical	36	12,246	12,491	11,072	10,410	10,239	11,472
Construction	343	11,043	11,441	10,319	8,995	9,004	9,512
Chemicals	2821	3,190	3,132	3,146	3,670	4,053	4,857
Other		3,118	2,911	2,549	2,010	2,132	2,392
TOTAL		72,893	71,686	65,728	61,130	60,241	65,889

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

TIN - U.S. SUPPLY
(Long Tons)

Year	Mine Production	% of Total Supply	Old Scrap	%	Total Scrap	Imports	Net Imports	%	Total Supply ¹
1953	56	<.1	21,439	16.3	30,914	110,543	110,340	83.7	131,835
1954	205	.2	19,053	18.0	29,334	87,739	86,917	82.0	106,175
1955	99	<.1	21,797	20.6	31,743	84,927	83,820	79.3	105,716
1956	--	--	19,747	20.1	32,973	79,278	78,388	79.9	98,135
1957	--	--	16,504	23.2	27,174	56,252	54,701	76.8	71,205
1958	--	--	13,580	23.1	22,810	46,589	45,248	76.9	58,828
1959	50	<.1	13,465	20.3	23,410	54,351	52,980	79.7	66,495
1960	10	<.1	12,270	18.9	22,050	53,564	52,707	81.1	64,987
1961	12	<.1	11,785	19.7	21,690	48,810	48,010	80.3	59,807
1962	12	<.1	11,667	20.1	21,040	46,765	46,330	79.9	58,009
1963	12	<.1	12,649	22.6	22,332	44,933	43,283	77.4	55,944
1964	65	.1	13,740	29.2	23,508	37,322	33,281	70.7	47,086
1965	47	.1	15,009	26.6	25,076	44,142	41,313	73.3	56,369
1966	97	.2	15,352	26.2	25,349	46,071	43,224	73.6	58,673
1967	72 ^x	.1	13,460	20.9	22,667	53,478	50,999	79.0	64,531
1968	72 ^x	.1	13,427	19.5	22,495	59,797	55,302	80.4	68,801
1969	72 ^x	.1	13,671	20.8	22,775	54,950	52,047	79.1	65,790
1970	72 ^x	.1	11,892	19.0	20,001	55,221	50,769	80.9	62,733
1971	72 ^x	.1	11,276	19.2	20,096	50,000	47,438	80.7	58,786
1972	72 ^x	.1	11,220	16.8	20,180	56,667	55,533	83.1	66,825
1973	72 ^x	.1	11,686	19.9	20,477	50,325	46,919	80.0	58,677

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973
^xYearbook of the American Bureau of Metal Statistics, 1974 (estimated average)

¹Total supply = mine production + old scrap + net imports

TIN - MAJOR U.S. IMPORT SOURCES
(Long Tons)

Country	1970		1971		1972		1973	
	Amount	% of Total U.S. Imports	Amount	%	Amount	%	Amount	%
Malaysia	31,819	57.6	27,746	55.5	32,645	57.6	28,255	56.1
Thailand	15,395	27.9	13,861	27.7	11,727	20.7	7,964	15.8
Bolivia	--	--	864	1.7	5,320	9.4	5,312	10.6
Indonesia	1,360	2.5	1,420	2.8	1,997	3.5	2,829	5.6
Australia	441	.1	1,116	2.2	2,184	3.4	1,963	3.9
China (People's Republic)	--	--	--	--	160	.3	1,727	3.4
TOTAL IMPORTS	55,221		50,000		56,667		50,325	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

TIN - MAJOR U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Production	% of Country's Production Exported to U.S.	% of U.S. Primary Demand Supplied	% of World Reserves
Malaysia	31.5	41.0	55.6	8.3
Thailand	9.1	57.2	22.4	12.0
Bolivia	12.8	9.6	5.3	9.8
Indonesia	8.7	9.4	3.5	24.0
Australia	4.4	14.0	2.6	1.9
China (People's Republic)	8.6	2.4	.9	15.0 ^x
(U.S.)	N.A.			(.4)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

^xU.S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973

TIN - RESERVES AND RESOURCES

DOMESTIC

Identified Resources ¹	41,535 long tons
Conditional Resources	43,000 long tons
Hypothetical Resources	40,000 long tons
Speculative Resources	70,000 long tons

FOREIGN

Identified Resources ²	9,936,230 long tons
Conditional Resources	10,218,000 long tons
Hypothetical Resources	9,249,000 long tons
Speculative Resources	7,434,700 long tons

Sources: U.S. Geological Survey, United States Mineral Resources (Professional Paper 820), 1973

¹At 1973 consumption levels this is a forward reserve of 8.5 months

²At 1973 mine production levels this is a forward reserve of 42.8 years

TIN - FOREIGN PRODUCTION AND CONSUMPTION
(Long Tons)

<u>Year</u>	<u>Mine Production</u> ¹	<u>Primary Consumption</u> ¹
1950	174,000	152,000
1951	168,000	140,000
1952	162,000	125,000
1953	174,000	126,000
1954	176,600	134,200
1955	169,800	143,900
1956	166,900	150,100
1957	158,200	143,000
1958	121,100	136,200
1959	114,000	148,200
1960	145,900	162,200
1961	136,500	157,600
1962	144,700	160,800
1963	143,500	161,600
1964	141,000	171,200
1965	148,200	167,700
1966	154,200	171,100
1967	174,200	169,800
1968	184,100	174,200
1969	177,800	182,000
1970	178,600	178,300
1971	183,700	182,600
1972	190,100 ^x	--
1973	201,300 ^x	--

Sources: American Metal Market, Metal Statistics, 1973

^xU.S. Bureau of Mines, Minerals Yearbook, 1973

¹Excludes People's Republic of China, USSR,
East Germany and Rumania

TUNGSTEN - U.S. CONSUMPTION
(Thousand Pounds of Contained Tungsten)

<u>Year</u>	<u>Consumption</u>
1951	11,410
1952	8,634
1953	7,734
1954	4,037
1955	8,967
1956	9,061
1957	8,544
1958	5,320
1959	9,835
1960	11,605
1961	11,128
1962	13,691
1963	11,061
1964	12,311
1965	13,868
1966	18,058
1967	13,860
1968	13,108
1969	16,056
1970	16,700
1971	11,622
1972	14,107
1973	15,386

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

TUNGSTEN - CONSUMPTION BY MAJOR END USE CATEGORIES

<u>Category</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Machinery	3545,353						
Metalworking machinery		6,670	8,150	8,520	5,940	7,720	8,080
Construction & mining machinery & equip.		<u>2,370</u>	<u>2,910</u>	<u>3,010</u>	<u>2,085</u>	<u>2,709</u>	<u>2,840</u>
Total		9,040	11,060	11,530	8,025	10,429	10,920
Transportation	37	1,960	2,470	2,510	1,745	1,602	1,845
Lamps & lighting	3641	788	938	1,000	695	957	1,076
Electrical	3694	525	642	665	465	564	615
Chemicals	2819	395	445	495	345	407	460
Other		400	501	500	347	148	470
TOTAL		13,108	16,056	16,700	11,622	14,107	15,386

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

TUNGSTEN - U.S. SUPPLY
(Thousand Pounds)

Year	Mine Shipments	% of Total Supply	Total Scrap	Imports	%	Exports	Net Imports	%	Total Supply
1951	5,973	52.3 ¹	N.A.	6,377	55.9 ¹				
1952	7,244	83.9 ¹		17,416	201.7 ¹				
1953	9,128	118.0 ¹		28,061	362.8 ¹				
1954	13,030	322.8 ¹		24,188	599.2 ¹				
1955	15,619	174.2 ¹		20,700	230.8 ¹				
1956	14,027	154.8 ¹	382	20,860	230.2 ¹				
1957	5,254	61.5 ¹	717	14,018	164.1 ¹				
1958	3,605	67.8 ¹	473	6,542	123.0 ¹	N.A.	N.A.		N.A.
1959	3,473	35.3 ¹	964	5,438	55.3 ¹				
1960	6,967	60.0 ¹	561	3,525	30.4 ¹				
1961	7,847	70.5 ¹	640	2,123	19.1 ¹				
1962	8,021	58.6 ¹	752	4,030	29.4 ¹				
1963	5,384	48.7 ¹	670	3,060	27.7 ¹				
1964	8,798	71.5 ¹	639	3,148	25.6 ¹				
1965	7,566	63.7 ¹	710	3,618	30.4	11	3,607	30.4	11,883
1966	7,166	58.4	906	4,298	35.0	101	4,197	34.2	12,269
1967	7,842	82.0	998	1,699	17.8	974	725	7.6	9,565
1968	9,042	84.8	500 ^{xx}	1,743	16.3 ¹	623	1,120	10.5 ¹	10,662
1969	7,910	68.1 ¹	N.A.	1,503	12.9 ¹	7,151	-5,648	-46.8 ¹	N.A.
1970	9,312	55.8 ¹	N.A.	1,284	7.7 ¹	19,470	-18,186	-108.9 ¹	N.A.
1971	6,827	117.3	582	418	7.2	2,006	-1,588	-27.3	5,821
1972	7,045	52.6	615	5,739	43.1	95	5,644	42.4	13,304
1973	7,059	39.2	500	10,552	58.6	90	10,462	58.1	18,021
1974	7,750 ^x								

Source: U.S. Bureau of Mines, Minerals Yearbook

^x U.S. Bureau of Mines, Commodity Data Summaries, 1975

^{xx} U.S. Bureau of Mines, Mineral Facts and Problems, 1970

¹ Percentage of U.S. consumption

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TUNGSTEN - MAJOR U.S. IMPORT SOURCES
(Thousand Pounds)

Country	1970		1971		1972		1973	
	Amount	%	Amount	%	Amount	%	Amount	%
Canada	1,234	96.1	203	48.6	1,634	28.5	3,189	30.2
Thailand					883	15.4	843	8.0
Peru	38	3.0	76	18.2	814	14.2	1,039	9.8
Bolivia					780	13.6	2,183	20.7
Australia			58	13.9	392	6.8	320	3.0
Mexico	27	2.1	81	19.4	90	1.6	333	3.2
TOTAL IMPORTS	1,284		418		5,739		10,552	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

TUNGSTEN - U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of World Mine Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of World Reserves*
Canada	4.5	42.5	10.8	13.3
Thailand	6.1	8.5	3.0	1.1
Peru	2.3	27.8	3.4	N.A.
Bolivia	5.7	16.1	5.1	2.4
Australia	4.0	6.4	1.3	2.1
Mexico	1.0	17.1	1.0	N.A.
(People's Republic of China)	18.6			~60.0
(U.S.)	10.4			6.7

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973
 *U.S. Bureau of Mines, Commodity Data Summaries, 1975

TUNGSTEN - RESERVES AND RESOURCES
(Thousand Pounds)

DOMESTIC

Reserves ¹	240,000
Resources	480,000 - 720,000

FOREIGN

Reserves ²	3,360,000
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Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹At 1973 consumption levels, this is a forward reserve of 15.6 years.

²At 1973 consumption levels, this is a forward reserve of 48.6 years.

TUNGSTEN - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Pounds)

<u>Year</u>	<u>Primary Production</u>	<u>Concentrate Consumption</u>
1964	53,130	45,906
1965	52,066	46,766
1966	54,603	47,383
1967	54,260	48,768
1968	59,717	53,372
1969	63,949	63,597
1970	61,735	68,938
1971	71,262	56,791
1972	76,320	62,476
1973	77,745	69,118

Source: U.S. Bureau of Mines, Minerals Yearbook

WOOD PRODUCTS (ROUNDWOODS) - U. S. SUPPLY¹
(billions of cubic feet)

<u>Year</u>	<u>Domestic Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>TOTAL</u>
1950	10.8	88.53	1.5	12.30	1.4	11.47	12.2
51	11.0	90.16	1.5	12.30	1.2	9.84	12.2
52	10.8	90.00	1.4	11.67	1.2	10.00	12.0
53	10.7	89.92	1.4	11.77	1.2	10.08	11.9
54	10.6	89.83	1.5	12.71	1.2	10.17	11.8
55	11.0	89.43	1.6	13.01	1.3	10.57	12.3
56	11.3	89.68	1.6	12.70	1.3	10.32	12.6
57	10.2	89.47	1.5	13.16	1.2	10.53	11.4
58	10.0	89.29	1.5	13.39	1.2	10.71	11.2
59	10.8	89.26	1.7	14.05	1.3	10.74	12.1
1960	10.2	89.47	1.7	14.91	1.2	10.53	11.4
61	10.0	89.29	1.7	15.18	1.2	10.71	11.2
62	10.2	87.93	1.9	16.38	1.4	12.07	11.6
63	10.6	88.33	2.0	16.67	1.4	11.67	12.0
64	11.2	89.60	2.0	16.00	1.3	10.40	12.5
65	11.5	89.15	2.1	16.28	1.4	10.85	12.9
66	11.5	89.15	2.2	17.05	1.4	10.85	12.9
67	11.2	90.32	2.2	17.74	1.2	9.68	12.4
68	11.7	90.00	2.4	18.46	1.3	10.00	13.0
69	11.6	89.23	2.5	19.23	1.4	10.77	13.0
1970	11.7	92.13	2.4	18.90	1.0	7.87	12.7
71	11.8	88.72	2.7	20.30	1.5	11.28	13.3
72	12.6	88.73	2.9	20.42	1.6	11.27	14.2

Source: U. S. Department of Agriculture, The Outlook for Timber in the United States, 1974 (FRR 20).

¹There are no records of imports on exports for "miscellaneous timber products," i.e., domestic production = apparent consumption. For the supply of pulpwood, see tables on Wood Products in this Appendix.

WOOD PRODUCTS - U. S. CONSUMPTION

(billions of cubic feet)

<u>Year</u>	<u>Round- woods</u>	<u>Pulpwood</u>	<u>Paper</u> (thousand tons)	<u>Misc. Timber Products</u>	<u>Poles</u> *	<u>Crossarms</u> *
1950	12.2	2.4	16.8	.8		
51	12.2	2.8	17.6	.7		
52	11.9	2.7	16.8	.7		
53	11.9	2.8	17.7	.7	.073	.004
54	11.8	2.7	17.9	.7	.064	.004
55	12.2	3.0	19.4	.6	.075	.004
56	12.6	3.5	20.5	.6	.086	.005
57	11.3	3.1	19.8	.6	.084	.005
58	11.2	2.9	19.6	.6	.074	.003
59	12.1	3.1	21.5	.5	.078	.004
1960	11.4	3.3	22.1	.5	.075	.004
61	11.2	3.2	22.5	.5	.076	.004
62	11.6	3.3	23.2	.5	.079	.004
63	12.0	3.4	24.0	.5	.077	.003
64	12.5	3.6	25.3	.5	.081	.004
65	12.8	3.9	27.0	.6	.084	.005
66	12.9	4.1	28.7	.6	.087	.006
67	12.4	4.0	28.8	.5	.084	.005
68	13.0	4.1	30.2	.5	.076	.003
69	13.0	4.4	31.8	.5	.074	.003
1970	12.7	4.4	31.7	.4	.077	.004
71	13.4	4.3	32.4	.5	.074	.003
72	14.2	4.3	34.1	.5	.075	.003

Sources: U. S. Department of Agriculture, The Outlook for Timber in the United States, 1974 (FRR 20)

*American Wood-Preservers' Association, Wood Preservation Statistics, 1974.

WOOD PRODUCTS (PULPWOOD) - U. S. SUPPLY
(billions of cubic feet)

<u>Year</u>	<u>Domestic Production</u>	<u>% of Total Supply</u>	<u>Imports</u>	<u>%</u>	<u>Net Imports</u>	<u>%</u>	<u>TOTAL</u>
1950	1.5	62.50	.9	37.50	.9	37.50	2.4
51	1.8	66.67	1.0	37.04	.9	33.33	2.7
52	1.8	69.23	.9	34.62	.8	30.77	2.6
53	1.9	70.37	.9	33.33	.8	29.63	2.7
54	2.0	71.43	.9	32.14	.8	28.57	2.8
55	2.2	73.33	1.0	33.33	.8	26.67	3.0
56	2.5	75.76	1.0	30.30	.8	24.24	3.3
57	2.4	75.00	1.0	31.30	.8	25.00	3.2
58	2.2	75.86	.9	31.04	.7	24.14	2.9
59	2.4	75.00	1.0	31.25	.8	25.00	3.2
1960	2.6	78.79	1.0	30.30	.7	21.21	3.3
61	2.5	78.13	1.0	31.25	.7	21.87	3.2
62	2.6	76.47	1.1	32.35	.8	23.53	3.4
63	2.7	77.14	1.1	31.43	.8	22.86	3.5
64	2.9	78.38	1.1	29.73	.8	21.62	3.7
65	3.1	79.49	1.2	30.77	.8	20.51	3.9
66	3.2	78.05	1.3	31.71	.9	21.95	4.1
67	3.2	82.05	1.2	30.77	.7	17.95	3.9
68	3.4	80.95	1.3	30.95	.8	19.05	4.2
69	3.6	83.72	1.3	30.23	.7	16.28	4.3
1970	3.8	86.36	1.3	29.55	.6	13.64	4.4
71	3.6	83.72	1.3	30.23	.7	16.28	4.3
72	3.7	86.05	1.2	27.91	.6	13.95	4.3

Source: U. S. Department of Agriculture, The Outlook for Timber in the United States, 1974 (FRR 20)

WOOD PRODUCTS (ROUNDWOODS) - U. S. IMPORT SOURCE INFORMATION
(million board feet)

<u>Country</u>	1969		1970		1971		1972	
	<u>Amount</u>	<u>% of Total Imports</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>	<u>Amount</u>	<u>%</u>
Canada	5,963.4	94.65	5,867.6	95.97	7,331.9	96.39	9,029.1	95.75
Mexico	6.7	.11	7.5	.12	6.5	.10	20.8	.22
TOTAL IMPORTS	6,300.6		6,114.3		7,606.8		9,430.1	

Source: U. S. Department of Agriculture, The Outlook for Timber in the United States, 1974
(FRR 20).

WOOD PRODUCTS (ROUNDWOOD) - FOREIGN CONSUMPTION AND PRODUCTION
(billion cubic feet)

<u>Year</u>	<u>Production</u>	<u>Consumption</u>
1969	64.1	62.7

Source: U. S. Department of Agriculture, The Outlook for
Timber in the United States, 1974 (FRR-20).

ZINC - U.S. CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Total Consumption</u>	<u>Slab Zinc Consumption</u>	<u>Industrial Demand</u> *
1950	1,343	967	
1951	1,326	934	
1952	1,212	853	
1953	1,342	986	
1954	1,181	884	
1955	1,459	1,120	
1956	1,323	1,009	
1957	1,232	936	
1958	1,142	868	
1959	1,278	956	
1960	1,159	878	
1961	1,208	931	
1962	1,333	1,032	
1963	1,414	1,105	
1964	1,536	1,207	1,179
1965	1,742	1,354	1,431
1966	1,820	1,424	1,553
1967	1,606	1,251	1,402
1968	1,745	1,351	1,491
1969	1,814	1,385	1,582
1970	1,572	1,187	1,388
1971	1,651	1,254	1,303
1972	1,844	1,418	1,519
1973	1,932	1,504	1,649

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

*U.S. Bureau of Mines, Minerals in the U. S. Economy, 1975.

ZINC - U.S. INDUSTRIAL CONSUMPTION BY MAJOR END-USE CATEGORY
(Thousand Short Tons)

<u>End Use</u>	<u>SIC Code</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Metal							
Construction	343, 344	496	526	459	409	489	533
Transportation	37	351	372	325	285	335	367
Electrical	363	175	186	162	135	166	180
Machinery	35	131	139	121	105	126	140
Other		<u>161</u>	<u>171</u>	<u>148</u>	<u>139</u>	<u>169</u>	<u>185</u>
Total Metal		1,314	1,394	1,215	1,073	1,285	1,405
Nonmetal							
Paint	2851	30	30	28	35	35	37
Chemicals	281, 3861	37	43	39	55	57	60
Rubber products	30	92	98	90	123	125	130
Other		<u>18</u>	<u>17</u>	<u>16</u>	<u>17</u>	<u>17</u>	<u>17</u>
Total Nonmetal		177	188	173	230	234	244
Other (ore, etc.)		254	232	184	348	325	283
TOTAL		1,745	1,814	1,572	1,651	1,844	1,932

Source: U.S. Bureau of Mines, Minerals in the U.S. Economy, 1975

ZINC - U.S. SUPPLY
(Short Tons)

Year	Mine Production	%	Old Scrap	%	Total Scrap	Imports ¹	%	Net Imports	%	Total Supply
1950	623,375	55.8	74,097	6.6	326,030	434,547	31.7	420,497	37.6	1,117,969
1951	681,189	61.9	68,174	6.2	314,377	390,820	29.0	351,220	31.9	1,100,583
1952	666,001	53.5	74,665	6.0	310,423	565,341	38.2	504,257	40.5	1,244,750
1953	547,430	40.9	64,235	4.8	294,678	748,300	47.7	727,378	54.3	1,339,043
1954	473,471	41.7	72,657	6.4	271,774	615,565	46.1	590,571	52.0	1,136,699
1955	514,671	41.1	83,549	6.7	304,775	673,740	45.7	655,671	52.2	1,136,699
1956	542,340	39.4	73,746	5.4	281,355	770,328	48.6	760,661	55.2	1,376,747
1957	531,735	38.2	76,789	5.5	264,104	795,021	50.3	784,229	56.3	1,392,753
1958	412,005	36.3	69,926	6.2	230,332	656,759	50.6	654,686	57.6	1,136,617
1959	425,303	37.2	73,848	6.5	276,254	657,078	48.8	645,448	56.3	1,144,599
1960	435,427	43.3	68,369	6.8	265,820	577,922	48.0	502,765	49.9	1,000,656
1961	464,390	45.7	59,407	5.9	237,967	543,262	45.5	491,537	48.4	1,015,334
1962	505,491	44.3	61,753	5.4	262,017	609,355	45.5	573,117	50.3	1,140,361
1963	529,254	49.2	62,564	5.8	268,255	517,526	40.4	483,656	45.0	1,075,474
1964	574,858	52.7	68,064	6.2	298,394	475,485	36.0	448,931	41.1	1,091,853
1965	611,153	48.2	82,009	6.5	353,364	581,030	37.7	575,091	45.3	1,268,253
1966	572,558	39.3	86,285	5.9	360,211	799,495	46.2	798,089	54.8	1,456,932
1967	549,413	40.1	80,309	5.9	319,849	756,204	47.0	739,395	54.0	1,369,117
1968	529,446	37.2	79,797	5.6	354,723	847,942	49.9	814,931	57.2	1,424,174
1969	553,124	35.6	81,627	5.3	376,391	926,896	50.2	917,598	59.1	1,552,349
1970	534,136	38.1	72,153	5.2	339,527	796,172	35.7	795,883	56.7	1,402,172
1971	502,543	40.8	80,043	6.5	359,153	662,089	43.8	648,742	52.7	1,231,328
1972	478,318	35.9	79,377	6.0	387,761	777,480	47.4	773,156	58.1	1,330,851
1973	478,850	35.6	93,337	6.9	387,539	787,778	48.1	773,212	57.5	1,345,399

Source: U.S. Bureau of Mines, Minerals Yearbook, 1950-1973

¹Excludes scrap

²Total Supply = Mine Production + Old Scrap + Net Imports

ZINC - U. S. IMPORT SOURCES
(Thousand Short Tons)

Country	1 9 7 0			1 9 7 1		1 9 7 2		1 9 7 3	
	Amount	% of Total U.S. Imports		Amount	%	Amount	%	Amount	%
Canada	438.6	55.1		360.0	54.4	406.6	52.3	433.1	55.0
Mexico	136.3	17.1		100.0	15.1	65.7	8.9	32.7	4.2
Peru	113.7	14.3		38.9	5.9	45.9	5.9	31.8	4.0
Australia	32.6	4.1		41.5	6.3	45.5	5.9	42.7	5.4
Belgium-Luxembourg	14.4	1.8		9.4	1.4	39.6	5.1	39.4	5.0
Japan	32.5	4.1		8.7	1.3	30.6	3.9	42.7	5.4
Honduras	19.3	2.4		21.5	3.2	17.4	2.2	16.0	2.0

Source: U. S. Bureau of Mines, Minerals Yearbook, 1970-1973.

ZINC - U. S. IMPORT SOURCE INFORMATION
(1970 - 197)

Country	% of World Mine Production	% of Country's Pro- duction Exported to U.S.	% of U. S. Demand Supplied	% of World * Reserves (1974)
Canada	22.9	28.9	23.4	26.0
Mexico	4.8	28.3	4.8	3.1
Peru	6.3	14.8	3.3	n.a.
Australia	8.6	7.7	2.3	6.7
Belgium-Luxembourg	-	-	1.5	-
Japan	5.0	9.3	1.6	n.a.
Honduras	.4	78.4	1.1	n.a.
(U. S.)	(8.1)			(22.9)

Source: U. S. Bureau of Mines, Minerals Yearbook
U. S. Bureau of Mines, Commodity Data Summaries, 1975.

ZINC - RESERVES AND RESOURCES

(Thousand Short Tons)

D o m e s t i c

Reserves ^{1, x}	30,000
Identified Resources	49,500
Hypothetical Resources	66,000
Subeconomic, but identified	82,500
Subeconomic and Speculative	<u>343,750</u>
TOTAL	541,750

F o r e i g n

Reserves ^{2, x}	101,000
Identified Resources	209,000
Hypothetical Resources	313,500
Subeconomic, but identified	1,320,000
Subeconomic and Speculative	<u>3,300,000</u>
TOTAL	5,243,500

Source: U. S. Geological Survey (Professional Paper 820), United States Mineral Resources, 1973.

^xU. S. Bureau of Mines, Commodity Data Summaries, 1975.

¹At the 1972 consumption of primary material level, this is a forward reserve of 24.4 years.

²At the 1972 level of production, this is a forward reserve of 17.9 years.

ZINC - FOREIGN PRODUCTION AND CONSUMPTION
(Thousand Short Tons)

<u>Year</u>	<u>Mine Production</u>	<u>Consumption</u>
1950	1,747	
51	1,919	
52	2,184	
53	2,393	
54	2,456	
55	2,685	
56	2,888	
57	2,938	
58	2,958	
59	3,015	
1960	3,245	
61	3,381	
62	3,424	
63	3,507	
64	3,865	
65	4,131	
66	4,369	
67	4,781	
68	4,954	4,000*
69	5,335	
1970	5,489	
71	5,652	
72	5,680	
73	5,898	
74	5,635	

Source: U. S. Bureau of Mines, Minerals Yearbook, 1973.

* Estimated by the Bureau of Mines, Mineral Facts & Problems, 1970.

ZIRCON¹ - U.S. CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Consumption</u> ¹
1966	132,000
1967	134,000
1968	143,000
1969	160,000
1970	145,000
1971	166,000
1972	168,000
1973	175,000

Sources: U.S. Bureau of Mines, Minerals
Yearbook

U.S. Bureau of Mines, Commodity
Data Summaries, 1975

¹Zircon equals about 49% zirconium

ZIRCON - MAJOR USES
(Short Tons)

End Use	1971		1972		1973		1974	
	Amount	%	Amount	%	Amount	%	Amount	%
Foundry Sands	99,600	60	104,160	62	96,250	55	95,400	53
Refractories	26,560	16	25,200	15	26,250	15	27,000	15
Ceramics	26,560	16	16,800	10	31,500	18	23,400	13
Zirconium Metal	13,280	8	18,480	11	21,000	12	34,200	19

Source: U.S. Bureau of Mines, Commodity Data Summaries, 1971-1975.

ZIRCON - U.S. SUPPLY
(Short Tons)

Year	Est. Mine Production	% of U.S. Consumption	Imports	% of U.S. Consumption	Exports	Net Imports	% of U.S. Consumption	Total
1966	78,400 ^{xx}	58.5 ¹	57,976	43.2 ¹	2,311	55,665	41.5 ¹	134,085
1967			59,303	44.3	2,729	56,574	42.2	
1968			59,900	41.9	2,026	57,874	40.5	
1969			95,414	59.6	5,395	90,019	56.3	
1970			94,759	65.4	4,335	90,460	62.4	
1971	W		96,387	58.1	9,429	86,958	52.4	
1972			67,537	40.2	17,360	50,177	29.9	
1973		46.4 ¹	98,023	75.9 ¹	28,921	69,102	53.5	
1974			65,000	36.1	20,000 ^x	45,000	25.0	N.A.

Sources: U.S. Bureau of Mines, Minerals Yearbook

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

^{xx}U.S. Bureau of Mines, Mineral Facts and Problems, 1970

W - withheld

¹Percent of total supply

ZIRCON - U.S. IMPORT SOURCES
(Short Tons)

Country	1970		1971		1972		1973	
	Amount	%	Amount	%	Amount	%	Amount	%
Australia	86,816	91.6	93,402	96.9	66,064	97.8	90,353	92.2
Canada	3,104	3.3	2,114	2.2	844	1.3	1,179	1.2
Rep. of S. Africa	355	.4	871	.9	385	.6	1,019	1.1
TOTAL IMPORTS	94,759		96,387		67,537		98,023	

Source: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

ZIRCON - U.S. IMPORT SOURCE INFORMATION
(1970-1973)

Country	% of Foreign Mine Production	% of Country's Production Exported to U.S.	% of U.S. Demand Supplied	% of Free World Reserves ^x
Australia	95.6	20.1	51.5	39.0
Canada	--	--	1.1	--
Rep. of S. Africa ¹ (U.S.)	.3	59.1	.4	~7.0 (~35.0)

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1970-1973

^xU.S. Bureau of Mines, Commodity Data Summaries, 1975

¹Actual production figures are not available. Figures used are the total imported by the U.S. and Japan.

ZIRCON¹ - RESERVES AND RESOURCES
(Thousand Short Tons)

DOMESTIC

Reserves ²	12,000
Identified Resources	>14,000

FOREIGN

Identified Resources ³	>26,000
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Source: U.S. Bureau of Mines, Commodity Data Summaries, 1975

¹Note zircon is 49% zirconium

²At 1974 consumption levels, this is a forward reserve of 66.7 years.

³At 1973 mine production levels, this is a forward reserve of 62.6 years.

ZIRCON - FOREIGN PRODUCTION AND CONSUMPTION
(Short Tons)

<u>Year</u>	<u>Mine Production</u> ¹	<u>Consumption</u>
1966	268,954	
1967	323,222	
1968	340,857	204,000 ^e
1969	425,319	
1970	439,493	
1971	467,991	
1972	417,261	
1973	415,302	

Sources: U.S. Bureau of Mines, Minerals Yearbook, 1972, 1973

¹Includes only the free world

^eU.S. Bureau of Mines, Mineral Facts and Problems, 1970

APPENDIX 6-A

INDUSTRY-LEVEL HISTORICAL DATA

VARIABLE CODE DEFINITIONS

IP&E58\$26 = Gross Investment in Plant and Equip. (1958 \$) - SIC26
IP&E58\$28 = Gross Investment in Plant and Equip. (1958 \$) - SIC28
IP&E58\$29 = Gross Investment in Plant and Equip. (1958 \$) - SIC29
IP&E58\$32 = Gross Investment in Plant and Equip. (1958 \$) - SIC32
IP&E58\$331 = Gross Investment in Plant and Equip. (1958 \$) - SIC331
IP&E58\$333 = Gross Investment in Plant and Equip. (1958 \$) - SIC333
JFRB26 = FRB Production Index - SIC26
JFRB28 = FRB Production Index - SIC28
JFRB29 = FRB Production Index - SIC29
JFRB32 = FRB Production Index - SIC32
JFRB331 = FRB Production Index - SIC331
JFRB333 = FRB Production Index - SIC333
KE26 = Effective Stock of Plant and Equip. (1958 \$) - SIC26
KE28 = Effective Stock of Plant and Equip. (1958 \$) - SIC28
KE29 = Effective Stock of Plant and Equip. (1958 \$) - SIC29
KE32 = Effective Stock of Plant and Equip. (1958 \$) - SIC32
KE331 = Effective Stock of Plant and Equip. (1958 \$) - SIC331
KE333 = Effective Stock of Plant and Equip. (1958 \$) - SIC333
KGP&E58\$26 = Gross Stock of Plant and Equip. (1958 \$) - SIC26
KGP&E58\$28 = Gross Stock of Plant and Equip. (1958 \$) - SIC28
KGP&E58\$29 = Gross Stock of Plant and Equip. (1958 \$) - SIC29
KGP&E58\$32 = Gross Stock of Plant and Equip. (1958 \$) - SIC32
KGP&E58\$331 = Gross Stock of Plant and Equip. (1958 \$) - SIC331
KGP&E58\$333 = Gross Stock of Plant and Equip. (1958 \$) - SIC333
RCU26 = Capacity Utilization - SIC26
RCU28 = Capacity Utilization - SIC28
RCU29 = Capacity Utilization - SIC29
RCU32 = Capacity Utilization - SIC32

VARIABLE CODE DEFINITIONS (cont.)

RCU331 = Capacity Utilization - SIC331

RCU333 = Capacity Utilization - SIC333

Sources: Investment* - U.S. Department of Commerce, Bureau of Economic Analysis.

Production* - Board of Governors of the Federal Reserve System, Division of Research and Statistics.

Gross Capital Stocks* - Derived by Data Resources, Inc., from the investment series' contained in this Appendix.

Effective Capital Stocks - Derived as described in Chapter 6 - Methodology.

Capacity Utilization - Derived as described in Chapter 6 - Methodology.

* Retrieved from Data Resources, Inc., computer data banks.

DATA: PAPER

	JFRB26#	RCJ26#	IP&E58#26 #	KE26#	KGP&E58#2 6#
58: 1	0.576333	0.826405	0.674671	9.643234	9.643234
58: 2	0.573667	0.812774	0.571424	9.754741	9.754741
58: 3	0.601667	0.844657	0.579519	9.839776	9.839776
58: 4	0.624000	0.867940	0.475915	9.926330	9.926330
59: 1	0.640000	0.884394	0.529588	9.986471	9.986471
59: 2	0.669667	0.918200	0.546827	10.059673	10.059673
59: 3	0.674333	0.917112	0.613190	10.136751	10.136751
59: 4	0.676000	0.910550	0.682058	10.229963	10.229963
60: 1	0.687333	0.915523	0.699281	10.339840	10.339840
60: 2	0.682000	0.898108	0.746237	10.453371	10.453371
60: 3	0.675000	0.877985	0.785002	10.577967	10.577967
60: 4	0.672000	0.882757	0.746237	10.711517	10.711517
61: 1	0.681333	0.864376	0.701545	10.834584	10.834584
61: 2	0.707333	0.887808	0.657603	10.945748	10.945748
61: 3	0.725000	0.901338	0.575919	11.045268	11.045268
61: 4	0.755000	0.931549	0.563326	11.123777	11.123777
62: 1	0.754000	0.923637	0.584276	11.198672	11.198672
62: 2	0.760000	0.923953	0.612361	11.278361	11.278361
62: 3	0.762000	0.918901	0.631497	11.364599	11.364599
62: 4	0.766333	0.916372	0.698474	11.455110	11.455110
63: 1	0.786333	0.931150	0.601518	11.561828	11.561828
63: 2	0.798000	0.937860	0.675757	11.643675	11.643675
63: 3	0.815333	0.949611	0.732091	11.743596	11.743596
63: 4	0.821000	0.946593	0.704310	11.857009	11.857009
64: 1	0.832000	0.950330	0.795295	11.962804	11.962804
64: 2	0.854333	0.965041	0.839114	12.090718	12.090718
64: 3	0.871667	0.973022	0.901347	12.228829	12.228829
64: 4	0.879333	0.968986	1.085740	12.381680	12.381680
65: 1	0.896000	0.971331	1.088330	12.579723	12.579723
65: 2	0.899000	0.959047	1.082753	12.777239	12.777239
65: 3	0.932000	0.978829	1.144015	12.972190	12.972190
65: 4	0.959667	0.991410	1.171343	13.181301	13.181301
66: 1	0.982000	0.997733	1.167792	13.396005	13.396005
66: 2	0.997333	0.996997	1.274802	13.608548	13.608548
66: 3	1.018333	1.000000	1.297968	13.846584	13.846584
66: 4	1.014333	0.978455	1.372514	14.089000	14.089000
67: 1	1.004333	0.950814	1.518499	14.348616	14.348616
67: 2	0.995000	0.924423	1.432538	14.613958	14.613958
67: 3	0.993000	0.906945	1.372923	14.858377	14.914526
67: 4	1.005667	0.904092	1.136464	15.088036	15.169352
68: 1	1.020667	0.906664	1.053578	15.262189	15.363551
68: 2	1.055667	0.927914	1.178433	15.416515	15.535878
68: 3	1.075000	0.933396	1.051764	15.599035	15.738398
68: 4	1.090333	0.937085	1.131036	15.751576	15.908050

DATA: PAPER (cont.)

	JFRB26#	RCJ26#	IP&E58\$26 #	KE26#	KGP&E58\$2 6#
69: 1	1.126000	0.956926	1.156453	15.921789	16.096514
69: 2	1.135333	0.953882	1.269579	16.097160	16.290215
69: 3	1.155000	0.957987	1.281195	16.297899	16.511050
69: 4	1.154000	0.944947	1.327028	16.500461	16.733479
70: 1	1.148333	0.927913	1.313260	16.712728	16.966049
70: 2	1.138667	0.906745	1.248071	16.920896	17.193797
70: 3	1.128667	0.888241	1.252918	17.113113	17.403899
70: 4	1.119000	0.871961	1.155260	17.305605	17.613967
71: 1	1.143667	0.882129	0.970491	17.474712	17.798375
71: 2	1.140333	0.874467	0.843114	17.567924	17.935498
71: 3	1.163333	0.888221	0.848673	17.636186	18.039964
71: 4	1.186333	0.901786	0.914472	17.705740	18.145200
72: 1	1.245667	0.942029	0.890505	17.788452	18.266263
72: 2	1.258667	0.947239	0.968629	17.866582	18.380616
72: 3	1.305333	0.976763	0.878901	17.960259	18.513822
72: 4	1.320000	0.983095	1.077118	18.036337	18.623807
73: 1	1.343333	0.993639	1.163108	18.151624	18.782694
73: 2	1.344333	0.986707	1.231520	18.283912	18.962137
73: 3	1.357000	0.987648	1.324209	18.429691	19.157619
73: 4	1.360667	0.981107	1.228539	18.593713	19.375114
74: 1	1.388333	0.992827	1.453929	18.738778	19.567403
74: 2	1.357333	0.960480	1.548694	18.928224	19.814900
74: 3	1.345333	0.941188	1.528112	19.136201	20.084621
74: 4	1.247667	0.863251	1.649134	19.339909	20.347597
75: 1	1.094333	0.748003	1.634995	19.567264	20.639270
75: 2	1.070333	0.722960	1.478221	19.791547	20.925680
75: 3	1.173667	0.784721	1.528251	19.984608	21.171198
75: 4	1.280333	0.847038	1.594624	20.187261	21.427769

DATA: CHEMICALS AND ALLIED PRDS.

	JFRB28#	RCJ28#	IP&E58\$28 #	KE28#	KGP&E58\$2 8#
58: 1	0.418000	0.815757	1.620861	19.126746	19.126746
58: 2	0.415667	0.793393	1.423434	19.373155	19.373155
58: 3	0.444667	0.832499	1.248995	19.568162	19.568162
58: 4	0.467667	0.860929	1.081017	19.717939	19.717939
59: 1	0.489667	0.888426	1.079456	19.824479	19.824479
59: 2	0.512333	0.916303	1.084705	19.929743	19.929743
59: 3	0.517333	0.912139	1.110530	20.035446	20.035446
59: 4	0.516667	0.897907	1.277470	20.146728	20.146728
60: 1	0.531333	0.908430	1.380408	20.298820	20.298820
60: 2	0.532333	0.894438	1.532752	20.475385	20.475385
60: 3	0.528667	0.871539	1.581257	20.688569	20.688569
60: 4	0.520333	0.841371	1.503649	20.912109	20.912109
61: 1	0.524000	0.832064	1.394490	21.114392	21.114392
61: 2	0.547333	0.854739	1.568294	21.287705	21.287705
61: 3	0.560000	0.858592	1.537759	21.503030	21.503030
61: 4	0.588333	0.886086	1.577685	21.708934	21.708934
62: 1	0.600333	0.887981	1.572961	21.923110	21.923110
62: 2	0.612000	0.889304	1.475532	22.134326	22.134326
62: 3	0.621667	0.888628	1.475532	22.319431	22.319431
62: 4	0.628667	0.884167	1.485113	22.503000	22.503000
63: 1	0.640000	0.885697	1.654179	22.687439	22.687439
63: 2	0.668000	0.908147	1.620510	22.912614	22.912614
63: 3	0.682333	0.911829	1.656946	23.127502	23.127502
63: 4	0.701333	0.921093	1.677704	23.349714	23.349714
64: 1	0.710333	0.916873	1.650207	23.575272	23.575272
64: 2	0.732333	0.929505	1.822987	23.792082	23.792082
64: 3	0.747000	0.930830	2.041410	24.050287	24.050287
64: 4	0.765667	0.934836	2.241590	24.360954	24.360954
65: 1	0.794333	0.948847	2.405279	24.719086	24.719086
65: 2	0.807000	0.941543	2.467529	25.115168	25.115168
65: 3	0.834333	0.950810	2.552677	25.523523	25.523523
65: 4	0.848000	0.943567	2.651874	25.949775	25.949775
66: 1	0.892000	0.968824	2.680666	26.397286	26.397286
66: 2	0.917667	0.972702	2.893000	26.848281	26.848281
66: 3	0.942333	0.973565	3.017029	27.348614	27.348614
66: 4	0.961000	0.967153	3.119508	27.876000	27.876000
67: 1	0.968000	0.948668	3.084171	28.424427	28.424427
67: 2	0.986333	0.943166	2.815326	28.927854	28.927854
67: 3	1.005333	0.940503	2.593114	29.363094	29.363094
67: 4	1.038667	0.952692	2.292145	29.741844	29.741844
68: 1	1.059333	0.955231	2.484459	30.045651	30.045651
68: 2	1.087000	0.962369	2.478844	30.393349	30.393349
68: 3	1.111333	0.966329	2.332895	30.737142	30.737142
68: 4	1.137000	0.972318	2.258164	31.043408	31.043408

DATA: CHEMICALS (cont.)

	JFRB28#	RCJ28#	IP&E58\$28 #	KE28#	KGP&E58\$2 8#
69: 1	1.172333	0.986752	2.457805	31.329505	31.521391
69: 2	1.202000	0.994483	2.385411	31.661364	31.874125
69: 3	1.228667	0.999998	2.539843	31.973408	32.205832
69: 4	1.212333	0.969734	2.531315	32.320165	32.573393
70: 1	1.200000	0.943642	2.568790	32.662294	32.935771
70: 2	1.194667	0.923527	2.622478	33.010855	33.304508
70: 3	1.211333	0.920400	2.759474	33.369679	33.683606
70: 4	1.204000	0.898523	2.433530	33.758657	34.093805
71: 1	1.216667	0.894071	2.506280	34.066561	34.419112
71: 2	1.256000	0.909346	2.451706	34.359523	34.759906
71: 3	1.278667	0.912563	2.420171	34.638302	35.084227
71: 4	1.298667	0.913954	2.525919	34.908231	35.397971
72: 1	1.340667	0.929895	2.329168	35.200624	35.735547
72: 2	1.384667	0.947899	2.322147	35.446422	36.021133
72: 3	1.420333	0.959810	2.362400	35.689144	36.302592
72: 4	1.439333	0.960014	2.636047	35.939569	36.591778
73: 1	1.468000	0.964677	2.667899	36.250788	36.946974
73: 2	1.494667	0.968066	2.822324	36.567302	37.307184
73: 3	1.521333	0.970191	3.125822	36.916978	37.703010
73: 4	1.534000	0.961626	3.317240	37.333528	38.171423
74: 1	1.552333	0.955681	3.460056	37.790951	38.683802
74: 2	1.564333	0.945254	3.292706	38.277882	39.227631
74: 3	1.569333	0.931910	3.800091	38.723465	39.725107
74: 4	1.491000	0.867765	3.379211	39.281642	40.345299
75: 1	1.357333	0.776364	3.478682	39.740209	40.855122
75: 2	1.355667	0.761812	3.524631	40.218351	41.385579
75: 3	1.461667	0.806969	3.471586	40.703731	41.923119
75: 4	1.544333	0.838111	3.199296	41.173740	42.442935

DATA: PETRO AND PRDS.

	JFRB29#	RCJ29#	IP&E58\$29 #	KE29#	KGP&E58\$2 9#
58: 1	0.665667	0.872273	3.189803	65.130412	65.130412
58: 2	0.692667	0.899078	2.766182	65.511946	65.511946
58: 3	0.715000	0.920855	2.478153	65.785138	65.785138
58: 4	0.723667	0.925838	2.550364	65.984579	65.984579
59: 1	0.749000	0.951675	2.712176	66.200798	66.200798
59: 2	0.735000	0.926957	2.642896	66.456090	66.456090
59: 3	0.735667	0.921200	2.723049	66.692431	66.692431
59: 4	0.746000	0.927264	2.725692	66.947302	66.947302
60: 1	0.748333	0.923356	2.639850	67.201205	67.201205
60: 2	0.762333	0.934091	2.955588	67.432027	67.432027
60: 3	0.778000	0.945600	2.712529	67.740309	67.740309
60: 4	0.778000	0.938871	2.897254	67.985858	67.985858
61: 1	0.778333	0.932004	2.833156	68.276020	68.276020
61: 2	0.793000	0.942492	2.969297	68.548304	68.548304
61: 3	0.799000	0.942132	2.891564	68.852885	68.852885
61: 4	0.819333	0.958813	2.916157	69.136088	69.136088
62: 1	0.841333	0.977092	3.068820	69.423630	69.423630
62: 2	0.829667	0.955766	2.892893	69.747502	69.747502
62: 3	0.837333	0.957473	3.133166	70.025324	70.025324
62: 4	0.851000	0.965139	2.940948	70.361440	70.361440
63: 1	0.870333	0.979720	2.877787	70.647355	70.647355
63: 2	0.877000	0.980148	2.917410	70.915654	70.915654
63: 3	0.881333	0.977344	3.057983	71.192146	71.192146
63: 4	0.883333	0.972522	3.166107	71.502015	71.502015
64: 1	0.898333	0.981115	3.274897	71.836936	71.836936
64: 2	0.909667	0.985226	3.433270	72.196916	72.196916
64: 3	0.910667	0.977634	3.354240	72.594191	72.594191
64: 4	0.913000	0.971856	3.504996	72.969171	72.969171
65: 1	0.920000	0.970600	3.541639	73.379445	73.379445
65: 2	0.915000	0.956698	3.618494	73.796261	73.796261
65: 3	0.939000	0.972842	3.822368	74.229628	74.229628
65: 4	0.946667	0.971262	3.960500	74.711196	74.711196
66: 1	0.966667	0.981792	4.161385	75.224222	75.224222
66: 2	0.963333	0.968006	4.236989	75.784193	75.784193
66: 3	0.969667	0.963883	4.316542	76.359489	76.359489
66: 4	0.972667	0.956322	4.345962	76.951000	76.951000
67: 1	0.977667	0.950778	4.480323	77.546088	77.546088
67: 2	0.990333	0.952865	4.619935	78.126163	78.170967
67: 3	1.004333	0.955762	4.256413	78.736763	78.826758
67: 4	1.025000	0.965924	4.511015	79.256947	79.387480
68: 1	1.030667	0.961148	4.461919	79.835566	80.008273
68: 2	1.045667	0.965218	4.415434	80.399387	80.612827
68: 3	1.053333	0.962629	4.517783	80.949107	81.201899
68: 4	1.057667	0.956780	4.472508	81.520515	81.812797

DATA: PETRO AND PRDS. (cont.)

	JFRB29#	RCJ29#	IP&E58\$29 #	KE29#	KGP&E58\$2 9#
69: 1	1.059333	0.948779	4.184691	82.078044	82.408475
69: 2	1.067000	0.947042	4.437005	82.563551	82.928394
69: 3	1.089333	0.957534	4.833604	83.107068	83.508072
69: 4	1.120667	0.974545	4.776080	83.742881	84.183198
70: 1	1.112333	0.957218	4.052096	84.361461	84.839632
70: 2	1.113333	0.950134	4.407104	84.802944	85.310878
70: 3	1.120000	0.947012	4.365422	85.327290	85.867866
70: 4	1.160667	0.972541	4.331294	85.838810	86.410877
71: 1	1.166667	0.970440	4.517406	86.351380	86.954389
71: 2	1.145000	0.942643	4.468606	86.830599	87.528457
71: 3	1.147667	0.936917	4.317136	87.297257	88.086660
71: 4	1.166667	0.944863	3.983047	87.728178	88.603431
72: 1	1.186000	0.953755	3.610169	88.082226	89.033379
72: 2	1.164333	0.946643	3.985170	88.350966	89.367362
72: 3	1.209333	0.959876	3.559445	88.703791	89.792963
72: 4	1.245667	0.982908	3.837097	88.959323	90.109414
73: 1	1.249667	0.979484	3.670451	89.288253	90.505758
73: 2	1.283667	1.000000	3.600655	89.567207	90.845409
73: 3	1.278333	0.989976	3.704455	89.829584	91.165442
73: 4	1.284667	0.988734	4.018744	90.114674	91.509382
74: 1	1.182333	0.903760	4.649461	90.469920	91.929697
74: 2	1.264000	0.958071	5.164639	90.966488	92.505007
74: 3	1.252000	0.939865	4.963248	91.577585	93.205439
74: 4	1.260667	0.937823	5.191731	92.140704	93.851049
75: 1	1.235333	0.910235	5.935610	92.753194	94.549657
75: 2	1.203667	0.876955	6.090487	93.531276	95.429774
75: 3	1.261333	0.908427	5.927426	94.341037	96.342990
75: 4	1.280333	0.911996	5.632890	95.110441	97.209609

DATA: STONE/CLAY/GLASS

	JFRB32#	RCJ32#	IP&E58\$32 #	KE32#	KGP&E58\$3 2#
58: 1	0.695667	0.831669	0.764564	8.067384	8.067884
58: 2	0.697333	0.821390	0.571137	8.205036	8.205036
58: 3	0.751000	0.876909	0.449553	8.292913	8.292913
58: 4	0.751667	0.873542	0.446447	8.349806	8.349806
59: 1	0.805000	0.931195	0.559972	8.405542	8.405542
59: 2	0.871333	1.000002	0.655650	8.489287	8.489287
59: 3	0.851667	0.967209	0.829372	8.596390	8.596390
59: 4	0.835667	0.934675	0.664143	8.746207	8.746207
60: 1	0.836667	0.926311	0.740120	8.853714	8.853714
60: 2	0.822333	0.899519	0.777567	8.979496	8.979496
60: 3	0.803333	0.867555	0.719249	9.113798	9.113798
60: 4	0.784000	0.837490	0.670651	9.232622	9.232622
61: 1	0.774667	0.819815	0.595775	9.338501	9.338501
61: 2	0.794667	0.834979	0.620853	9.424953	9.424953
61: 3	0.824333	0.859532	0.703408	9.517095	9.517095
61: 4	0.834333	0.861599	0.786360	9.629260	9.629260
62: 1	0.841333	0.858838	0.605889	9.761412	9.761412
62: 2	0.858000	0.869988	0.701391	9.847563	9.847563
62: 3	0.862333	0.866566	0.672566	9.957012	9.957012
62: 4	0.868000	0.865255	0.691783	10.058522	10.058522
63: 1	0.876000	0.865956	0.671283	10.164157	10.164157
63: 2	0.912667	0.895296	0.650242	10.263961	10.263961
63: 3	0.924000	0.900080	0.659178	10.357836	10.357836
63: 4	0.920333	0.890183	0.611993	10.453317	10.453317
64: 1	0.937667	0.901692	0.704267	10.536363	10.536363
64: 2	0.956000	0.912121	0.701509	10.641922	10.641922
64: 3	0.969333	0.917810	0.670636	10.746110	10.746110
64: 4	0.972667	0.914764	0.734683	10.841857	10.841857
65: 1	0.985667	0.919532	0.758675	10.952976	10.952976
65: 2	0.995333	0.920740	0.848385	11.069349	11.069349
65: 3	1.024333	0.937090	0.892517	11.207370	11.207370
65: 4	1.043667	0.945139	0.885961	11.355501	11.355501
66: 1	1.063333	0.952800	1.039985	11.501002	11.501002
66: 2	1.072667	0.948134	0.949331	11.684035	11.684035
66: 3	1.049000	0.916720	1.040294	11.843180	11.843180
66: 4	1.026000	0.885038	1.146542	12.024000	12.024000
67: 1	1.003667	0.853014	0.986356	12.230172	12.230172
67: 2	0.977333	0.822937	0.884698	12.371246	12.394919
67: 3	0.995333	0.832005	0.831679	12.488764	12.533148
67: 4	1.023667	0.850393	0.719729	12.593829	12.657198
68: 1	1.011000	0.836427	0.698770	12.673182	12.752430
68: 2	1.056667	0.871007	0.778357	12.747510	12.841784
68: 3	1.073333	0.880322	0.721511	12.839557	12.950438
68: 4	1.097000	0.896200	0.722676	12.918395	13.044153

DATA: STONE/CLAY/GLASS (cont.)

	JFRB32#	RCJ32#	IP&E58\$32 #	KE32#	KGP&E58\$3 2#
69: 1	1.144333	0.931241	0.854811	12.997197	13.137532
69: 2	1.136333	0.919102	0.909934	13.105557	13.263320
69: 3	1.113667	0.894539	0.921007	13.225916	13.402047
69: 4	1.108000	0.883779	0.806259	13.348254	13.542614
70: 1	1.079000	0.856403	0.833594	13.444119	13.653554
70: 2	1.069000	0.843969	0.814263	13.545751	13.770584
70: 3	1.053333	0.827535	0.719522	13.642569	13.881999
70: 4	1.056000	0.826935	0.687460	13.717552	13.968983
71: 1	1.074333	0.839047	0.648171	13.784971	14.047369
71: 2	1.120667	0.873819	0.529742	13.838204	14.115409
71: 3	1.099000	0.857159	0.655936	13.865460	14.153386
71: 4	1.104000	0.859600	0.664670	13.920240	14.222657
72: 1	1.146333	0.890955	0.809817	13.976781	14.293648
72: 2	1.163667	0.900794	0.783616	14.064843	14.400451
72: 3	1.199667	0.925367	0.871465	14.146885	14.499989
72: 4	1.236333	0.949044	0.969402	14.247818	14.620823
73: 1	1.274333	0.972119	0.975358	14.369756	14.765333
73: 2	1.309667	0.992868	1.030101	14.492523	14.910365
73: 3	1.302333	0.980484	1.048922	14.626756	15.068112
73: 4	1.301000	0.972560	1.042973	14.764560	15.229509
74: 1	1.295667	0.961940	0.884071	14.900504	15.388338
74: 2	1.286333	0.950783	0.931322	15.001208	15.506379
74: 3	1.251000	0.920015	0.949461	15.111816	15.635443
74: 4	1.195333	0.874505	0.850844	15.225925	15.768178
75: 1	1.091000	0.795214	0.765653	15.318033	15.875370
75: 2	1.050667	0.763947	0.851653	15.391162	15.960547
75: 3	1.087333	0.787760	0.734729	15.482756	16.066655
75: 4	1.124000	0.812777	0.769839	15.548440	16.142821

DATA: STEEL

	JFRB331#	RCJ331#	IP&E58\$33 1#	KE331#	KGP&E58\$3 31#
65: 1	1.105000	0.944827	1.319329	25.892188	25.892188
65: 2	1.096667	0.931528	1.386430	25.975125	25.975125
65: 3	1.115333	0.941436	1.483485	26.074046	26.074046
65: 4	0.923667	0.774035	1.535285	26.196287	26.196287
66: 1	1.001667	0.833108	1.475913	26.330313	26.330313
66: 2	1.063000	0.878000	1.561759	26.448218	26.448218
66: 3	1.129333	0.925647	1.528223	26.586460	26.586460
66: 4	1.095000	0.890988	1.538066	26.715000	26.715000
67: 1	0.987000	0.797264	1.655875	26.844775	26.844775
67: 2	0.918000	0.736998	1.708804	26.943567	27.002765
67: 3	0.998667	0.796549	1.645889	27.053525	27.172480
67: 4	1.103333	0.874775	1.620040	27.149729	27.324849
68: 1	1.093333	0.861866	1.661660	27.240206	27.469302
68: 2	1.108000	0.868145	1.570419	27.339437	27.622783
68: 3	0.954333	0.743772	1.740413	27.418877	27.751990
68: 4	0.956667	0.740663	1.704643	27.534626	27.922463
69: 1	1.057667	0.813702	1.608236	27.642317	28.082369
69: 2	1.100667	0.842108	1.530454	27.729002	28.216647
69: 3	1.160000	0.883151	1.419341	27.798814	28.330200
69: 4	1.201333	0.910927	1.322930	27.844720	28.414892
70: 1	1.055333	0.797586	1.316648	27.870036	28.474674
70: 2	1.088333	0.819357	1.304138	27.894211	28.532315
70: 3	1.101000	0.826786	1.241061	27.915909	28.586279
70: 4	1.031667	0.772652	1.158134	27.924305	28.623959
71: 1	1.065667	0.796488	1.154384	27.915233	28.640548
71: 2	1.103000	0.822700	0.946553	27.906642	28.656041
71: 3	0.807000	0.601645	0.887520	27.853762	28.619429
71: 4	0.836000	0.623254	0.953175	27.788905	28.568408
72: 1	0.960333	0.715556	0.865904	27.738962	28.534287
72: 2	1.018667	0.759109	0.867449	27.670937	28.478674
72: 3	1.108667	0.826248	0.847629	27.604053	28.423977
72: 4	1.218000	0.907933	0.866293	27.533704	28.364846
73: 1	1.156333	0.862017	0.899220	27.468184	28.310946
73: 2	1.150667	0.857607	0.917845	27.410519	28.265791
73: 3	1.295000	0.964815	0.909502	27.357570	28.225724
73: 4	1.342667	1.000000	0.936573	27.303500	28.183952
74: 1	1.192333	0.887539	1.083539	27.255925	28.149348
74: 2	1.177667	0.875104	1.206636	27.240569	28.151814
74: 3	1.271667	0.942394	1.227811	27.252057	28.185030
74: 4	1.234333	0.912096	1.459837	27.268269	28.223224
75: 1	1.091333	0.802642	1.505872	27.334497	28.319060
75: 2	0.897000	0.656394	1.618662	27.410375	28.425491
75: 3	0.912333	0.663635	1.593086	27.510176	28.559104
75: 4	0.950333	0.687420	1.471417	27.603964	28.685050

DATA: NONFERROUS METALS

	JFRB333#	RCJ333#	IP&E58\$33 3#	KE333#	KGP&E58\$3 33#
65: 1	0.977333	0.916207	0.622265	6.625563	6.625563
65: 2	0.983667	0.911431	0.591305	6.718803	6.718803
65: 3	1.016333	0.932121	0.681565	6.803426	6.803426
65: 4	1.067000	0.965740	0.785560	6.909818	6.909818
66: 1	1.054667	0.938926	0.792246	7.041208	7.041208
66: 2	1.024000	0.896941	0.911308	7.173034	7.173034
66: 3	1.067333	0.916574	0.866398	7.333385	7.333385
66: 4	1.134333	0.957108	0.918739	7.481000	7.481000
67: 1	1.142333	0.945958	0.945595	7.640312	7.640312
67: 2	1.096667	0.892262	0.975708	7.794437	7.804839
67: 3	0.893000	0.713605	0.929980	7.954468	7.975369
67: 4	0.829667	0.652434	0.869029	8.102180	8.132840
68: 1	0.828000	0.642200	0.897931	8.234063	8.273593
68: 2	1.049000	0.502115	0.889431	8.371729	8.420247
68: 3	1.150000	0.872518	0.948479	8.506136	8.563396
68: 4	1.326000	0.985540	0.896779	8.653604	8.719961
69: 1	1.298333	0.952540	0.843894	8.787400	8.862127
69: 2	1.224000	0.888013	0.896500	8.907407	8.989736
69: 3	1.296667	0.929251	0.874286	9.038957	9.129295
69: 4	1.411333	1.000003	0.870560	9.164065	9.261988
70: 1	1.355000	0.949627	0.955686	9.287206	9.392501
70: 2	1.260000	0.871800	0.843204	9.429629	9.543068
70: 3	1.312333	0.899294	0.897997	9.543937	9.664099
70: 4	1.384000	0.938265	0.975757	9.670352	9.797689
71: 1	1.319000	0.883218	0.778068	9.814258	9.949462
71: 2	1.243000	0.828966	0.866951	9.877958	10.050386
71: 3	1.130667	0.749719	0.710320	9.959168	10.172580
71: 4	1.336333	0.883820	0.712014	10.009098	10.254468
72: 1	1.300000	0.857587	0.885447	10.059313	10.336009
72: 2	1.293000	0.847932	0.727486	10.143849	10.460141
72: 3	1.355333	0.886365	0.825605	10.196792	10.543614
72: 4	1.353667	0.881205	0.837415	10.269089	10.650833
73: 1	1.397000	0.905098	0.965723	10.343504	10.759995
73: 2	1.371333	0.882171	1.036638	10.443111	10.900208
73: 3	1.413000	0.901451	1.203920	10.556372	11.056830
73: 4	1.398667	0.882327	1.181557	10.702299	11.253799
74: 1	1.404333	0.876578	1.265963	10.843088	11.443325
74: 2	1.390667	0.857807	1.445066	10.999925	11.652170
74: 3	1.347333	0.818899	1.427428	11.191473	11.903326
74: 4	1.438000	0.861796	1.417266	11.378511	12.148704
75: 1	1.265333	0.748126	1.237467	11.562531	12.388739
75: 2	1.118667	0.654732	1.481482	11.709909	12.581566
75: 3	1.097000	0.633134	1.096526	11.904872	12.833583
75: 4	1.122333	0.643047	1.069200	12.022430	12.986991

APPENDIX 6-B - PRODUCT-LEVEL HISTORICAL DATA

PORTLAND CEMENT

(000 000 St/yr)

<u>Date</u>	(1) <u>Shipments</u>	(2) <u>Capacity</u> (end-of-year)
1960	587.1	813.9
1961	603.0	832.9
1962	623.8	881.7
1963	656.6	897.7
1964	688.7	901.7
1965	703.3	907.0
1966	715.7	930.9
1967	703.2	956.8
1968	747.2	957.0
1969	770.5	953.7
1970	734.1	836.8
1971	790.1	857.9
1972	814.3	854.0
1973	866.0	837.0
1974	777.5	950.0
1975	682.0	995.0

Sources: (1) and (2) - U.S. Department of the Interior, Bureau of Mines, Minerals Yearbook (Vol. I), 1972; Commodity Data Summaries (1974,75).

SPECIALITY PORCELAIN

(000 000 lbs/yr)

<u>Date</u>	<u>Consumption</u>
1960	126.0
1961	243.0
1962	322.6
1963	314.3
1964	368.5
1965	434.2
1966	486.2
1967	502.6
1968	683.9
1969	724.9
1970	766.0
1971	753.4
1972	872.4
1973	908.0
1974	904.2
1975	563.1

Source: Consumption of Specialty Porcelain Products in the production of electrical distribution equipment. Derived by applying historical equipment shipments to the Task 3 input coefficient matrix.

GLASS
(1967 = 1.0)

<u>Date</u>	(1)	(2)
	<u>FRB Production Index Pressed & Blown Glass (SIC322)</u>	<u>Index of Consumption Glass Fiber*</u>
1960	0.67	
1961	0.70	
1962	0.73	
1963	0.77	
1964	0.82	
1965	0.89	
1966	0.98	
1967	1.00	1.00
1968	1.03	1.30
1969	1.15	1.58
1970	1.16	1.40
1971	1.14	1.79
1972	1.20	2.24
1973	1.25	2.67
1974	1.26	2.47
1975	1.27	2.11

- Sources: (1) - Board of Governors of the Federal Reserve System, Statistical Release G.12.3, 'Business Indexes,' and supplements thereto.
- (2) - Consumption of glass fiber in production of reinforced plastics. Derived from consumption of reinforced plastics as presented in W. Fallwell, "Reinforced Plastics Finally Resume Growth," Chemical and Engineering News, (Feb. 2, 1976), p. 8.

BENZENE
(000 000 gal/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u> (end of year)
1960	457	-
1961	543	572
1962	542	821
1963	648	951
1964	731	951
1965	827	-
1966	955	-
1967	969	-
1968	1021	1269
1969	1185	1269
1970	1134	-
1971	1076	-
1972	1221	1472
1973	1453	1800
1974	1513	1800
1975	1045	1850

Sources: (1) and (2) - Stanford Research Institute, Chemical Economics Handbook, (618.5022 and 5021A);
Chemical and Engineering News, (May 3, 1976),
p. 32.

(2) - Chemical and Engineering News, (May 10, 1976), p. 13;
Fortune, (Feb., 1976), p. 99.

ETHYLENE
(000 000 lbs/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u> (end of year)
1960	5448	-
1961	5656	-
1962	6283	-
1963	7518	-
1964	8614	-
1965	9570	-
1966	11241	-
1967	11855	-
1968	13151	15000
1969	16436	17000
1970	18089	18500
1971	18450	22000
1972	20852	23500
1973	22326	24700
1974	23890	25200
1975	19782	25457

Sources: (1) and (2) - Stanford Research Institute, Chemical Economics Handbook, (648.5051 - 5033);
Modern Plastics (May, 1976), p. 16.

(1) - Chemical and Engineering News, (May 3, 1976), p. 32.

CHLORINE GAS (100% CL₂)
(000 ST/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u>
1960	4637	-
1961	4601	-
1962	5143	-
1963	5464	-
1964	5945	-
1965	6517	-
1966	7204	-
1967	7608	-
1968	8444	-
1969	9376	-
1970	9764	-
1971	9352	-
1972	9869	-
1973	10402	9700
1974	10616	10735 (est.)
1975	9029	10900

Sources: (1) - U.S. Department of Commerce, Bureau of Economic Analysis, Business Statistics, (various years); Chemical and Engineering News, (May 3, 1976), p. 32.

(2) - Modern Plastics, (May, 1974), p. 44;
(May, 1976), p. 13.

POLYETHYLENE^{*}
(000 000 lbs/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u> (end of year)
1960	1337.2	
1961	1606.3	
1962	2016.2	
1963	2269.9	
1964	2613.4	
1965	3047.4	
1966	3558.0	
1967	3798.6	
1968	4567.7	
1969	5489.9	
1970	5844.1	
1971	6395.8	
1972	7699.0	8135
1973	8440.0	8900
1974	8810.0	9950
1975	7190.0	10300

^{*} low plus high-density polyethylene

Sources: (1) and (2) - Chemical and Engineering News, (Nov. 17, 1975), p. 12; Modern Plastics, (Jan. 1976), p. 50; (Jan. 1975), p. 57.

(1) - U.S. Department of Commerce, Bureau of Economic Analysis, Business Statistics (various issues).

POLYPROPYLENE
(000 000 lbs/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u> (end of year)
1963	196.9	-
1964	270.2	-
1965	374.1	-
1966	553.5	-
1967	662.3	-
1968	878.2	-
1969	1089.9	-
1970	1030.9	-
1971	1256.7	-
1972	1726.3	1803.8
1973	2162.0	2104.3
1974	2249.0	2724.9
1975	1902.0	2991.6

Sources: (1) and (2) - Modern Plastics (Jan. 1976), p. 50;
(Jan. 1975), p. 57, Chemical and Engineering News, (Feb. 16, 1976), p. 12.

(1) - U.S. Department of Commerce, Bureau of Economic Analysis, Business Statistics, (various issues).

VINYL AND POLYVINYL CHLORIDE

(000 000 lbs/yr)

<u>Date</u>	<u>Vinyl</u>		<u>Poly</u>		
	(1) <u>Production</u>	(2) <u>Capacity</u>	(3) <u>Production</u> (old series)	(4) <u>Production</u> (new series)	(5) <u>Capacity</u> (end of yr.)
1960			1203		
1961			1260		
1962			1566		
1963			1760		
1964			2067		
1965			2312		
1966			2670		
1967			2672		
1968			3215		
1969			3032		
1970			3756		
1971			4076	3437	
1972				4259	4439
1973	5351	6003		4562	4801
1974	5620	6709		4850	5838
1975	4196	6840		3640	6603

* includes "other vinyls"

Sources: (1) thru (5) - Modern Plastics, (Jan. 1976), p. 50; (Jan. 1975), p. 57, Chemical and Engineering News, (August, 1975), p. 8.

(3) and (4) - U.S. Department of Commerce, Bureau of Economic Analysis, Business Statistics, (various issues).

PHENOL AND PHENOLIC RESINS

(000 000 lbs/yr)

<u>Date</u>	<u>Phenol</u>		<u>Phenolic</u> [*]	
	(1) <u>Production</u>	(2) <u>Capacity</u>	(3) <u>Production</u>	(4) <u>Capacity</u>
1960	-	-	651	
1961	-	-	665	
1962	-	-	690	
1963	-	-	741	
1964	1063	-	833	
1965	-	-	922	
1966	-	-	1047	
1967	-	-	983	
1968	-	-	1097	
1969	-	-	1181	
1970	-	-	1186	
1971	-	-	1142	
1972	2052	-	1453	
1973	2241	2637	1387	1598
1974	2302	2637	1335	1598 (est.)
1975	1722	2674	1050	1764

* includes molding compounds

Sources: (1), (2), (3) and (4) - Modern Plastics, (Jan. 1975), p. 57.

(3) - U.S. Department of Commerce, Bureau of Economic Analysis,
Business Statistics, (various issues).

SYNTHETIC RUBBER

(000 LT/yr)

<u>Date</u>	(1)	(2)
	<u>Production</u>	<u>Capacity</u>
1960	1436	
1961	1404	
1962	1575	
1963	1609	
1964	1765	
1965	1813	
1966	1970	
1967	1912	
1968	2131	
1969	2251	
1970	2197	
1971	2241	2700
1972	2417	
1973	2585	
1974	2477	2857
1975	1911	

Sources: (1) - U.S. Department of Commerce, Bureau of Economic Analysis, Business Statistics, (various issues) and Survey of Current Business, (various issues).

(2) - Arthur D. Little, Inc., Material Shortage Study, (20 Dec. 1974), p. 336, (prepared for the Department of Commerce).

PAINTS (SIC285)

(1967 = 1.0)

<u>Date</u>	<u>Production Index</u>
1960	0.73
1961	0.71
1962	0.75
1963	0.82
1964	0.89
1965	0.96
1966	1.05
1967	1.00
1968	1.08
1969	1.13
1970	1.08
1971	1.04
1972	1.22
1973	1.20
1974	1.26
1975	1.19

Source: Board of Governors of the Federal Reserve System, Statistical Release G.12.3, 'Business Indexes,' and supplements thereto.

STAINLESS STEEL
(000 ST/yr)

<u>Date</u>	<u>Net Shipments of Mill Products</u>	<u>Imports</u>
1960	592.6	
1961	584.3	
1962	640.5	
1963	669.9	
1964	810.6	
1965	886.9	
1966	944.5	
1967	850.4	
1968	849.2	
1969	917.4	
1970	748.0	177.2
1971	754.2	193.2
1972	896.9	146.4
1973	1159.1	128.3
1974	1485.6	176.1

Source: Bureau of Census, Current Industrial Reports,
MA33-B, (various issues).

NON-ORIENTED ELECTRICAL STEEL SHEETS

(000 ST/yr)

<u>Date</u>	(1)	(2)
	<u>Shipments</u>	<u>Domestic Receipts</u> *
1960	337.3	316.7
1961	334.0	311.7
1962	339.4	310.3
1963	308.6	283.7
1964	352.1	322.1
1965	390.3	365.5
1966	393.8	374.6
1967	355.9	339.3
1968	307.0	291.9
1969	328.9	304.2
1970	321.1	283.0
1971	267.4	247.6
1972	337.1	357.4
1973	360.4	362.9
1974	312.3	311.8
1975	222.0 (est.)	241.0 (est.)

* Domestic Receipts = Shipments + Net Imports

Source: (1) and (2) - F.B. O'Brien and S.J. Campbell,
 "Outlook for Energy, Electricity, and
 Alloy Electrical Steel," (Dec. 1975),
 Armco Steel Corporation, Economic
 Research Department (internal report).

ORIENTED ELECTRICAL STEEL SHEETS

(000 ST/yr)

<u>Date</u>	(1)	(2)
	<u>Shipments</u>	<u>Domestic Receipts</u>
1960	187.2	146.3
1961	171.8	148.6
1962	181.8	158.0
1963	196.8	176.0
1964	242.8	217.2
1965	278.0	254.2
1966	275.3	260.2
1967	293.1	283.0
1968	291.9	286.3
1969	305.1	297.9
1970	329.5	320.1
1971	293.0	296.0
1972	278.3	290.3
1973	375.6	377.3
1974	400.6	391.9
1975	260.0 (est.)	250.0 (est.)

Source: (1) and (2) - F.P. O'Brien and S.J. Campbell,
 "Outlook for Energy, Electricity,
 and Alloy Electrical Steel," (Dec.
 1975), Armco Steel Corporation,
 Economic Research Department
 (internal report).

ALUMINUM (U.S. plus Canada)

(Primary ingot; 0000 ST/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Capacity</u> (end of year)
1960	277.7	334.2
1961	256.7	336.2
1962	280.8	337.7
1963	303.2	339.7
1964	339.6	351.0
1965	358.5	370.8
1966	385.8	402.6
1967	423.3	438.4
1968	423.4	473.1
1969	487.2	497.8
1970	503.7	543.1
1971	503.0	567.8
1972	512.2	592.5
1973	555.9	608.0
1974	601.3	612.6
1975	479.0	624.0

Source: (1) and (2) - American Bureau of Metal
Statistics; Yearbook (various
years); Department of the Interior,
Bureau of Mines, Commodity Data
Summaries (various years).

COPPER

(Primary plus Secondary Refined, 0000 ST/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Consumption</u>	(3) <u>Capacity</u> (end of year)
1960	181.1	135.0	233.2
1961	182.1	146.3	234.2
1962	190.1	160.0	233.5
1963	189.8	174.4	233.5
1964	300.8	182.5	233.5
1965	215.7	200.5	242.1
1966	220.2	236.0	243.1
1967	154.0	193.6	252.2
1968	184.4	188.0	264.3
1969	224.2	214.2	267.6
1970	227.7	204.3	267.6
1971	199.2	201.9	279.3
1972	229.7	223.9	279.3
1973	233.3	243.7	279.3
1974	215.2	219.4	289.0
1975	184.5	150.0	303.0 (est.)

Sources: (1), (2) and (3) - Department of the Interior, Bureau of Mines, Mineral Yearbook (Vol. I, 1972), p. 474; Commodity Data Summaries, (various years); Fairchild Publications, Inc., Metal Statistics (various years).

LEAD
(0000 ST/yr)

<u>Date</u>	<u>Production</u> (primary)	<u>Consumption</u>	<u>Capacity</u> (end of year)
1960		102.1	
1961		102.7	
1962		111.0	
1963		116.3	
1964		120.2	
1965		124.2	
1966		132.4	
1967		126.1	
1968		132.9	
1969		138.9	
1970		136.1	
1971	66.6	143.1	
1972	68.8	148.5	
1973	68.8	154.1	
1974	68.3	159.9	
1975	63.7	122.6	85.0

Sources: (1) and (2) - American Bureau of Metal Statistics, Yearbook, (various years); Department of Interior, Bureau of Mines, Commodity Data Summaries (various years).

(3) - Engineering and Mining Journal, (June 1976), p. 85.

SLAB ZINC
(0000 ST/yr)

<u>Date</u>	(1) <u>Production</u>	(2) <u>Consumption</u>	(3) <u>Capacity</u> (end of year)
1960	86.8	87.8	126.1
1961	90.2	93.1	127.1
1962	93.8	103.2	129.9
1963	95.3	110.5	133.0
1964	102.6	120.7	132.7
1965	107.8	135.4	133.8
1966	110.8	135.6	133.7
1967	101.2	123.7	136.7
1968	110.1	133.4	137.3
1969	111.1	136.8	135.0
1970	95.5	118.7	129.6
1971	84.7	125.4	107.1
1972	70.7	141.8	103.4
1973	66.6	150.4	96.9
1974	63.4	128.8	91.6
1975	49.4	95.0	85.8 (est.)

Sources: (1), (2) and (3) - American Bureau of Metal Statistics, Yearbook, (various years); Department of Interior, Bureau of Mines, Commodity Data Summaries (various years).

APPENDIX 6-C

PRODUCT-LEVEL FORECAST EQUATIONS

VARIABLE CODE DEFINITIONS

BZ = Benzene production (000 000 gal/yr)
CG = Chlorine gas (100% CL₂) production (000 St/yr)
DDTS = Domestic transformer shipments (MVA) - Distribution
ETH = Ethylene production (000 000 lbs/yr)
EX58 = Exports of goods and services (1958 \$)
IC58 = Investment in construction - total (1958 \$)
JFRB = FRB production index - total
JFRB19&G = FRB production index - ordinance
JFRB20 = FRB production index - foods
JFRB23 = FRB production index - apparel
JFRB282 = FRB production index - synthetic materials
JFRB285 = FRB production index - paints
JFRB29 = FRB production index - petro.
JFRB322 = FRB production index - pressed and blown glass
JFRB335 = FRB production index - nonferrous mill products
JFRB336 = FRB production index - nonferrous castings
JFRB35 = FRB production index - nonelectrical machinery
JFRB361&2 = FRB production index - major electrical equip. and parts
JFRB363 = FRB production index - household appliances
JFRB364&7&9 = FRB production index - lighting and Misc. Elect. Prds.
JFRB371 = FRB production index - motor vehicles and parts
JFRB372 = FRB production index - aircraft and parts

JFRBMD = FRB production index - durable manufacturing
KREGCARS = Registration of cars (public and private)
NOESR = Domestic receipts (consumption) of non-oriented electrical steel
(000 st/yr)
OESR = Domestic receipts (consumption) or oriented electrical steel
(000 st/yr)
PE = Polyethylene production (000 000 lbs/yr)

PP = Polypropylene production (000 000 lbs/yr)
 PR = Phenolic Resin (including molding compounds) production
 (000 000 lbs/yr)
 PRES = PE + PR + PVC
 PVC = Polyvinyl Chloride production (000 000 lbs/yr)
 SPC = Portland Cement shipments (000 ST/yr)
 SR = Synthetic Rubber production (000 LT/yr)
 SSNS = Net Shipments of Stainless Steel Products (000 ST/yr)
 Time = Time Trend (1947 = 1.0)
 WPI = Wholesale Price Index - all commodities
 WPIOS = Wholesale Price Index - fuels, related prds., power

FUNCTION NAMES

EXP = Exponential (antilog)
 LOG = "log to base e"
 (-1) = Indicates that the variable has been lagged one period

EQUATIONS (see VARIABLE CODE DEFINITIONS)

(EQ1) CG = EXP(4.4374 + .507329 * log(PVVC) + .019776 * Time)
 (6.60) (4.22) (1.49)

Method: OLS (Ordinary Least Squares Regression)

Interval: Annual, 1960-75

$\bar{R}^2 = .97$, D-W = 1.22

(EQ2) ETH = EXP(.356952 + 1.01216 * log(PRES))
 (1.63) (41.4)

Method: OLS

Interval: Annual, 1960-75

$\bar{R}^2 = .99$, D-W = 1.55

$$(EQ3) \quad BZ = \frac{EXP(6.82017 + .496215 * \log(JFRB282) + 1.19502 * \log(JFRB23) - .416901 * \log(WPIO5NS(-1)/WPI(-1)))}{(282.4) \quad (6.66) \quad (2.78) \quad (-1.44)}$$

Method: OLS

Interval: Annual, 1960-75

$$\bar{R}^2 = .97, D-W = 1.85$$

$$(EQ4) \quad PE = \frac{EXP(4.7606 + 1.44956 * \log(JFRB) + .952656 * \log(EX58))}{(4.66) \quad (3.77) \quad (3.59)}$$

Method: OLS

Interval: Annual, 1960-75

$$\bar{R}^2 = .97, D-W = 0.95$$

$$(EQ5) \quad PP = \frac{EXP(2.08839 + 3.35058 * \log(JFRB) + 1.17902 * \log(EX58))}{(1.61) \quad (5.95) \quad (3.49)}$$

Method: OLS

Interval: Annual 1963-75

$$\bar{R}^2 = .98, D-W = 1.72$$

$$(EQ6) \quad PVC = \frac{EXP(6.67046 + 1.55636 * \log(JFRB) + .341146 * \log(EX58))}{(7.91) \quad (4.89) \quad (1.56)}$$

Method: OLS

Interval: 1960-75

$$\bar{R}^2 = .98, D-W = 2.21$$

$$(EQ7) \quad PR = \frac{EXP(7.32301 + 1.48751 * \log(JFRB) - .0170764 * \text{Time}))}{(43.6) \quad (8.96) \quad (-2.28)}$$

Method: OLS

Interval: 1960-75

$$\bar{R}^2 = .97, D-W = 1.81$$

$$(EQ8) \quad SR = \frac{EXP(5.06947 + .572529 * \log(JFRB371) + .569002 * \log(KREGCARS(-1)))}{(9.90) \quad (4.46) \quad (4.82)}$$

Method: OLS

Interval: 1960-75

$$\bar{R}^2 = .90, D-W = 1.49$$

$$(EQ9) \quad SPC = 154.907 + 10.1783 * IC58 + 4.14544 * Time$$

(3.52) (7.34) (2.68)

Method: OLS

Interval: Annual, 1958-75

$$\bar{R}^2 = .93, D-W = 1.14$$

$$(EQ10) \quad JFRB322 = EXP(.572195 + 1.85422 * \log(JFRB20) + .176409 * \\ (1.38) \quad (2.92) \quad (2.65) \\ \log(JFRB364\&7\&9) - .0275172 * Time) \\ (-1.40)$$

Method: OLS

Interval: Annual, 1958-75

$$\bar{R}^2 = .99, D-W = 1.16$$

$$(EQ11) \quad SSNS = 219.156 + 1494.51 * (.3763 * JFRB35 + .2151 * JFRB371 + \\ (3.15) \quad (6.81) \\ .1936 * JFRB363 + .1398 * (ICER58/22.6) + .0753 * JFRB372) \\ - 40.0042 * Time \\ (-3.80)$$

Method: OLS

Interval: Annual, 1960-75

$$\bar{R}^2 = .90, D-W = 1.14$$

$$(EQ12) \quad OESR = EXP(10.4375 + .698810 * \log(DDTS) - .015265 * Time) \\ (29.31) \quad (2.11) \quad (0.414)$$

Method: OLS

Interval: 1960-74

$$\bar{R}^2 = .85, D-W = 1.00$$

$$(EQ13) \quad NOESR = 2.20 * 100 * JFRB361\&2$$

Method: The coefficient represents the asymptotic level for the secular decline in the ratio NOESR/JFRB361&2, as estimated by F.P. O'Brien and S.J. Campbell, "Outlook for Energy, Electricity and Alloy Electrical Steel," (ARMCO Steel Corp. internal memo dated December, 1975).

$$(EQ14) \quad ALP = -65.8683 + 272.955 * JFRBMD + 10.6371 * Time$$

$$(-2.61) \quad (3.32) \quad (3.31)$$

Method: OLS

Interval: 1957-75

$$\bar{R}^2 = .96, D-W = 1.56$$

$$(EQ15) \quad CONCU = 27.1071 + 106.194 * JFRB335 + 100.952 * JFRB336 -$$

$$(2.39) \quad (6.20) \quad (5.87)$$

$$1.83735 * Time$$

$$(-2.54)$$

Method: OLS

Interval: 1957-75

$$\bar{R}^2 = .97, D-W = 1.92$$

$$(EQ16) \quad CONLD = 24.8381 + 29.9714 * (.6 * JFRB371 + .18 * JFRB29 +$$

$$(6.07) \quad (3.42)$$

$$.07 * JFRB285 + .08 * JFRB19\&G + .07 * JFRB361\&2) +$$

$$.956364 * KREGCARS(-1)$$

$$(8.45)$$

Method: OLS

Interval: 1957-75

$$\bar{R}^2 = .98, D-W = 1.90$$

$$(EQ17) \quad CONZN = 27.1505 + 79.2568 * JFRB371 + 67.5077 * JFRBMD -$$

$$(3.98) \quad (5.20) \quad (2.50)$$

$$2.45664 * Time$$

$$(-3.08)$$

Method: OLS

Interval: 1957-75

$$\bar{R}^2 = .98, D-W = 2.10$$