

Use of Minerals and Materials in the United States From 1900 Through 2006

Since the beginning of the 20th century, the types and quantities of raw materials used by U.S. manufacturers and consumers have changed significantly as the economy has moved from one that is predominantly agricultural to one that is primarily industrial. This fact sheet quantifies the materials (other than food and fuel) input into the U.S. economy from 1900 through 2006.

Previous studies have tracked the flow of minerals and materials by monetary value as a way of determining their effect on the U.S. economy. This information is the first attempt to document the flow of these materials in physical terms, which can help in assessing their potential adverse effect on the physical environment. This fact sheet presents the amounts (by weight) of raw minerals and materials used in the four categories of physical goods that support the U.S. economy. These four categories are agriculture, forestry, metals and minerals, and nonrenewable organics.

Table 1 is a listing of the amount of minerals and materials used, and figures 1 and 2 are graphical representations of these data. Figure 3 is a listing of those minerals and materials used in the United States from 1900 through 2006. Note that the data in the table are only for materials that are ready for use or manufacture in products that were actually made in the United States, not for materials contained in finished goods that were imported into or exported out of the country. These data represent the annual apparent inputs to the use phase (domestic production plus imports plus recycling minus exports) aggregated by category. For example, even though a significant amount of cadmium metal is contained in electronic goods imported into the country, the cadmium data provided in this study are only for the cadmium used in products that were produced in the United States. In an industrial economy such as that of the United States, where the volume of goods flowing into and out of the country is large, tracking the flow of materials embedded in imported products is not only difficult but virtually impossible. The data provided are for the first point of consumption; ultimate consumption in the form of manufactured products could be significantly different.

Throughout the lifecycle of any material, the potential exists for losses to and adverse effects on the environment through

emissions, losses, wastes, or dissipation of materials into the environment.

Many sources were used to compile the data for this fact sheet. The following is a list of the primary ones used:

- U.S. Department of Agriculture, Agricultural Statistics (for agriculture statistics)
- National Oceanic and Atmospheric Administration, Fisheries of the United States (for fisheries statistics)
- U.S. Bureau of Mines and U.S. Geological Survey, Mineral Resources of the United States, and Minerals Yearbook (for metal and mineral statistics)
- U.S. Census Bureau, Statistical Abstract of the United States (for agriculture statistics)
- Resources for the Future, Natural Resource Commodities—A Century of Statistics (for agriculture statistics)
- U.S. Energy Information Administration, Annual Energy Review (for nonrenewable organics statistics)
- U.S. Forest Service, U.S. Timber Production, Trade, Consumption, and Price Statistics (for forestry and paper statistics)
- U.S. International Trade Commission, Synthetic Organic Chemicals (for nonrenewable organics statistics, and statistics on primary products made from petroleum and natural gas)

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Table 1. Raw materials used in the United States from 1900 through 2006.

[In thousand metric tons. --, negligible or no data]

Year	Agriculture	Forestry			Metals and minerals				Nonrenewable organics	Total of materials
		Wood	Paper and paperboard	Recycled paper	Primary metals	Recycled metals	Industrial minerals	Construction materials		
1900	3,040	60,300	2,640	--	10,300	--	10,800	55,300	1,590	144,000
1901	3,460	62,800	2,670	--	13,100	--	11,300	61,000	1,670	156,000
1902	3,660	65,600	2,690	--	14,800	--	13,300	70,000	1,760	172,000
1903	3,300	67,100	2,720	--	14,100	--	14,000	67,000	1,880	170,000
1904	3,560	69,000	2,750	--	12,900	--	20,100	70,100	1,900	180,000
1905	3,680	70,600	2,720	--	17,800	--	23,000	81,200	1,960	201,000
1906	3,740	75,800	2,690	--	20,800	12	27,400	95,200	2,040	228,000
1907	3,310	80,800	2,670	--	21,100	44	28,700	90,000	2,130	229,000
1908	3,570	74,200	2,640	--	12,900	29	25,400	81,900	2,170	203,000
1909	3,490	78,800	3,720	--	20,900	83	31,000	109,000	2,260	249,000
1910	3,380	78,800	3,680	--	23,000	123	34,900	125,000	2,370	271,000
1911	3,710	75,900	3,650	--	20,400	133	35,500	122,000	2,590	264,000
1912	4,090	77,700	3,610	--	26,200	184	38,300	124,000	2,930	277,000
1913	3,800	76,200	3,570	--	26,400	180	39,300	141,000	3,310	294,000
1914	3,890	72,400	4,890	--	18,800	152	37,300	130,000	3,560	271,000
1915	4,000	69,300	4,840	--	23,200	219	38,800	131,000	4,230	276,000
1916	4,140	73,000	4,800	--	29,700	295	43,800	132,000	4,870	293,000
1917	4,120	69,200	5,490	--	30,500	297	45,400	114,000	5,360	274,000
1918	4,050	65,200	5,690	--	29,200	277	40,600	93,300	5,250	244,000
1919	3,860	67,400	5,670	--	23,300	290	38,900	97,600	5,530	243,000
1920	3,750	67,200	6,900	--	30,300	307	48,200	115,000	5,790	277,000
1921	3,520	58,200	5,470	--	14,100	243	36,500	104,000	5,160	228,000
1922	4,170	64,100	7,130	--	26,700	382	47,800	125,000	6,380	282,000
1923	4,220	70,100	8,340	--	34,100	486	57,900	173,000	8,390	357,000
1924	4,260	67,200	8,420	--	29,000	495	59,500	194,000	10,000	373,000
1925	4,560	66,300	9,450	--	34,500	558	65,900	214,000	10,400	406,000
1926	4,600	65,100	10,500	--	36,600	653	67,100	232,000	10,600	427,000
1927	4,860	61,300	10,800	--	33,800	653	66,000	255,000	11,200	444,000
1928	4,750	59,500	11,300	--	38,400	715	68,200	249,000	12,900	444,000
1929	4,930	61,700	12,200	--	42,000	750	69,600	282,000	14,400	487,000
1930	4,410	49,500	11,200	--	30,600	619	60,000	255,000	13,900	425,000
1931	4,280	36,200	10,300	--	20,300	506	46,800	193,000	12,300	324,000
1932	3,640	27,500	8,830	--	11,300	387	32,000	149,000	10,600	243,000
1933	4,180	31,200	9,900	--	17,500	506	33,100	143,000	11,100	250,000
1934	3,620	32,900	10,200	--	19,400	540	37,100	168,000	12,500	284,000
1935	4,070	38,000	11,600	--	25,000	657	42,100	165,000	13,200	300,000
1936	4,360	44,500	13,300	--	35,500	682	54,500	249,000	15,900	418,000
1937	5,010	46,800	14,500	--	39,200	739	59,800	259,000	17,400	442,000
1938	4,040	41,300	12,300	--	25,000	520	48,300	250,000	17,200	398,000
1939	5,280	46,000	14,500	--	39,300	573	58,600	304,000	18,900	487,000
1940	6,420	48,700	15,200	--	44,900	660	65,000	319,000	19,200	519,000
1941	7,280	56,300	18,500	--	61,200	922	83,900	380,000	22,400	631,000
1942	6,410	56,300	17,900	--	59,300	936	89,200	402,000	22,300	655,000
1943	6,640	52,100	17,600	--	59,200	1,040	95,600	325,000	21,700	579,000
1944	6,260	50,400	17,600	--	59,000	1,090	88,500	281,000	23,100	527,000
1945	6,070	44,500	17,800	--	56,400	1,090	89,800	279,000	25,600	520,000
1946	6,800	51,400	20,400	--	48,600	1,020	107,000	353,000	27,500	616,000
1947	6,800	53,000	22,400	--	60,500	1,280	131,000	394,000	28,900	698,000
1948	7,310	54,500	23,700	--	39,100	30,700	140,000	437,000	29,500	761,000
1949	6,630	47,700	22,400	--	37,500	23,800	131,000	438,000	28,300	735,000
1950	7,100	56,200	26,300	--	45,300	32,600	151,000	501,000	31,500	851,000
1951	6,860	53,600	27,700	--	54,000	31,700	165,000	555,000	34,600	928,000
1952	6,710	53,800	26,300	--	38,900	32,600	162,000	600,000	33,100	954,000
1953	6,820	53,500	28,400	--	54,300	31,700	170,000	605,000	34,700	985,000

Table 1. Raw materials used in the United States from 1900 through 2006.—Continued

[In thousand metric tons. --, negligible or no data]

Year	Agriculture	Forestry			Metals and minerals				Nonrenewable organics	Total of materials
		Wood	Paper and paperboard	Recycled paper	Primary metals	Recycled metals	Industrial minerals	Construction materials		
1954	6,680	52,900	28,500	--	42,200	24,600	172,000	813,000	35,300	1,180,000
1955	6,880	54,700	31,500	--	55,600	33,700	193,000	881,000	38,700	1,300,000
1956	6,830	55,100	33,100	--	49,100	38,600	201,000	942,000	41,500	1,370,000
1957	5,990	48,700	32,000	--	53,400	29,500	190,000	976,000	40,900	1,380,000
1958	5,800	49,800	31,900	--	42,400	22,200	185,000	1,030,000	42,700	1,410,000
1959	6,390	54,600	35,100	--	51,300	27,600	211,000	1,100,000	46,300	1,530,000
1960	6,380	49,100	27,200	8,400	52,800	24,900	206,000	1,120,000	47,300	1,540,000
1961	6,740	48,500	28,200	8,400	49,700	24,100	206,000	1,100,000	48,600	1,520,000
1962	7,220	50,600	30,000	8,460	55,600	24,400	217,000	1,140,000	51,800	1,580,000
1963	7,400	54,200	30,700	8,970	58,200	28,300	230,000	1,270,000	52,800	1,740,000
1964	7,650	57,000	33,000	9,190	65,300	30,600	244,000	1,340,000	55,500	1,840,000
1965	7,060	60,700	31,700	9,560	75,300	34,400	258,000	1,420,000	59,400	1,960,000
1966	7,540	61,000	34,900	9,880	73,600	35,300	272,000	1,480,000	64,000	2,030,000
1967	8,050	58,600	34,900	9,280	64,200	38,300	270,000	1,430,000	64,500	1,970,000
1968	9,130	60,900	37,200	9,600	78,200	38,300	280,000	1,460,000	70,600	2,050,000
1969	6,890	61,000	38,200	11,200	61,600	42,000	290,000	1,520,000	75,700	2,100,000
1970	6,530	60,200	36,800	11,400	60,300	38,100	286,000	1,530,000	80,400	2,110,000
1971	6,790	64,700	37,300	11,700	64,200	38,900	289,000	1,510,000	81,800	2,110,000
1972	7,590	66,900	40,500	12,400	61,900	46,600	308,000	1,540,000	85,400	2,170,000
1973	5,420	66,700	42,100	13,800	71,300	53,000	321,000	1,730,000	92,600	2,390,000
1974	4,830	57,900	40,900	14,200	63,800	57,100	315,000	1,650,000	91,500	2,300,000
1975	5,770	53,500	34,900	11,900	45,600	44,100	276,000	1,420,000	79,900	1,980,000
1976	5,860	60,300	39,700	14,000	55,900	47,200	296,000	1,500,000	89,200	2,110,000
1977	5,660	66,100	40,800	14,800	63,800	46,600	313,000	1,590,000	97,000	2,230,000
1978	5,410	68,800	43,100	15,200	70,700	48,300	331,000	1,730,000	99,100	2,410,000
1979	5,730	67,500	44,200	16,300	32,100	55,300	339,000	1,750,000	106,000	2,420,000
1980	5,070	58,800	42,500	16,300	48,000	49,800	311,000	1,500,000	112,000	2,140,000
1981	5,140	54,700	44,000	16,100	60,500	46,600	294,000	1,330,000	105,000	1,960,000
1982	5,410	55,300	41,800	15,500	55,100	34,100	257,000	1,180,000	94,700	1,740,000
1983	5,320	66,400	46,100	17,000	46,700	40,400	274,000	1,300,000	93,500	1,880,000
1984	5,740	71,500	49,500	18,600	57,900	44,000	310,000	1,480,000	98,700	2,130,000
1985	6,590	72,900	48,800	18,500	52,900	47,100	309,000	1,540,000	97,600	2,190,000
1986	6,170	77,900	50,200	20,400	46,400	47,900	299,000	1,630,000	102,000	2,280,000
1987	6,480	82,700	52,700	21,800	46,000	53,000	308,000	1,800,000	111,000	2,480,000
1988	5,940	80,300	52,900	23,700	48,400	57,300	322,000	1,870,000	115,000	2,570,000
1989	5,730	81,000	51,700	24,600	43,900	55,700	318,000	1,810,000	114,000	2,510,000
1990	5,530	77,900	51,300	26,400	41,900	58,900	318,000	1,840,000	114,000	2,540,000
1991	5,300	71,000	45,100	31,200	38,800	52,800	299,000	1,620,000	119,000	2,280,000
1992	5,020	74,800	48,600	30,800	44,200	54,600	309,000	1,790,000	125,000	2,480,000
1993	7,590	76,200	50,400	32,200	30,100	58,700	314,000	1,890,000	132,000	2,590,000
1994	7,920	77,400	50,300	36,000	55,800	62,900	338,000	2,020,000	138,000	2,780,000
1995	5,800	77,100	48,900	38,300	54,200	64,000	341,000	2,060,000	135,000	2,830,000
1996	6,160	77,800	46,400	39,100	66,000	62,200	354,000	2,140,000	138,000	2,930,000
1997	6,080	78,800	50,100	39,900	69,300	64,500	359,000	2,260,000	140,000	3,060,000
1998	5,630	80,600	50,700	40,900	79,900	61,400	368,000	2,470,000	135,000	3,290,000
1999	5,330	83,100	52,700	42,500	81,900	58,600	382,000	2,530,000	150,000	3,390,000
2000	5,150	82,300	50,600	42,900	82,400	61,400	371,000	2,560,000	144,000	3,400,000
2001	4,890	80,100	45,600	42,600	65,200	59,700	363,000	2,600,000	135,000	3,390,000
2002	4,650	82,600	45,000	43,200	68,000	60,700	355,000	2,520,000	136,000	3,320,000
2003	4,410	82,200	46,300	44,700	75,400	60,700	373,000	2,580,000	133,000	3,400,000
2004	4,190	90,100	48,900	45,600	85,300	63,800	391,000	2,750,000	141,000	3,620,000
2005	3,980	91,400	45,900	46,500	75,000	62,800	402,000	2,850,000	138,000	3,720,000
2006	3,780	91,900	45,800	46,700	89,700	63,300	390,000	2,910,000	136,000	3,780,000

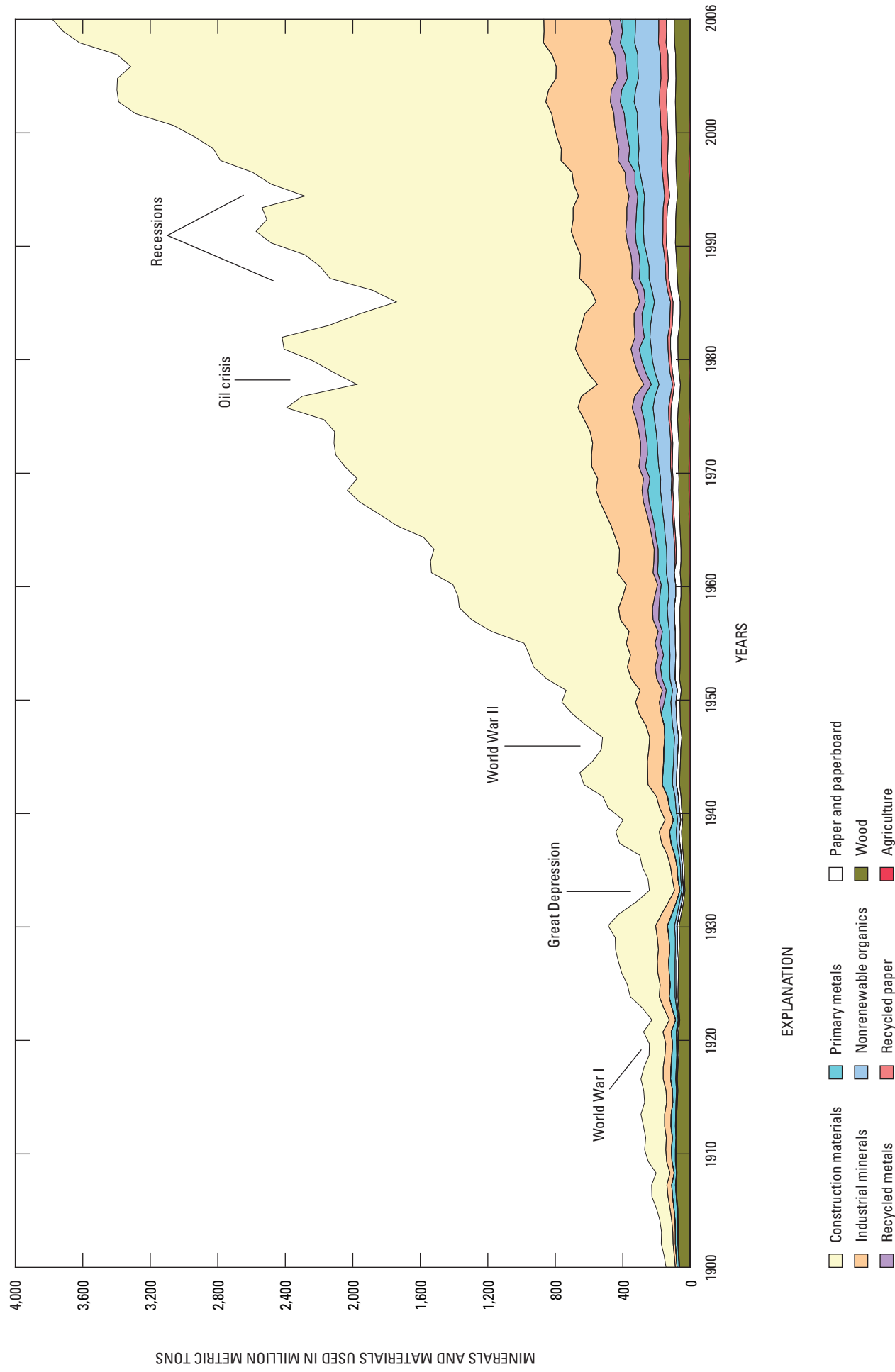


Figure 1. Minerals and materials used for physical goods in the United States from 1900 through 2006. Mineral and materials embedded in imported goods are not included. [In million of metric tons]

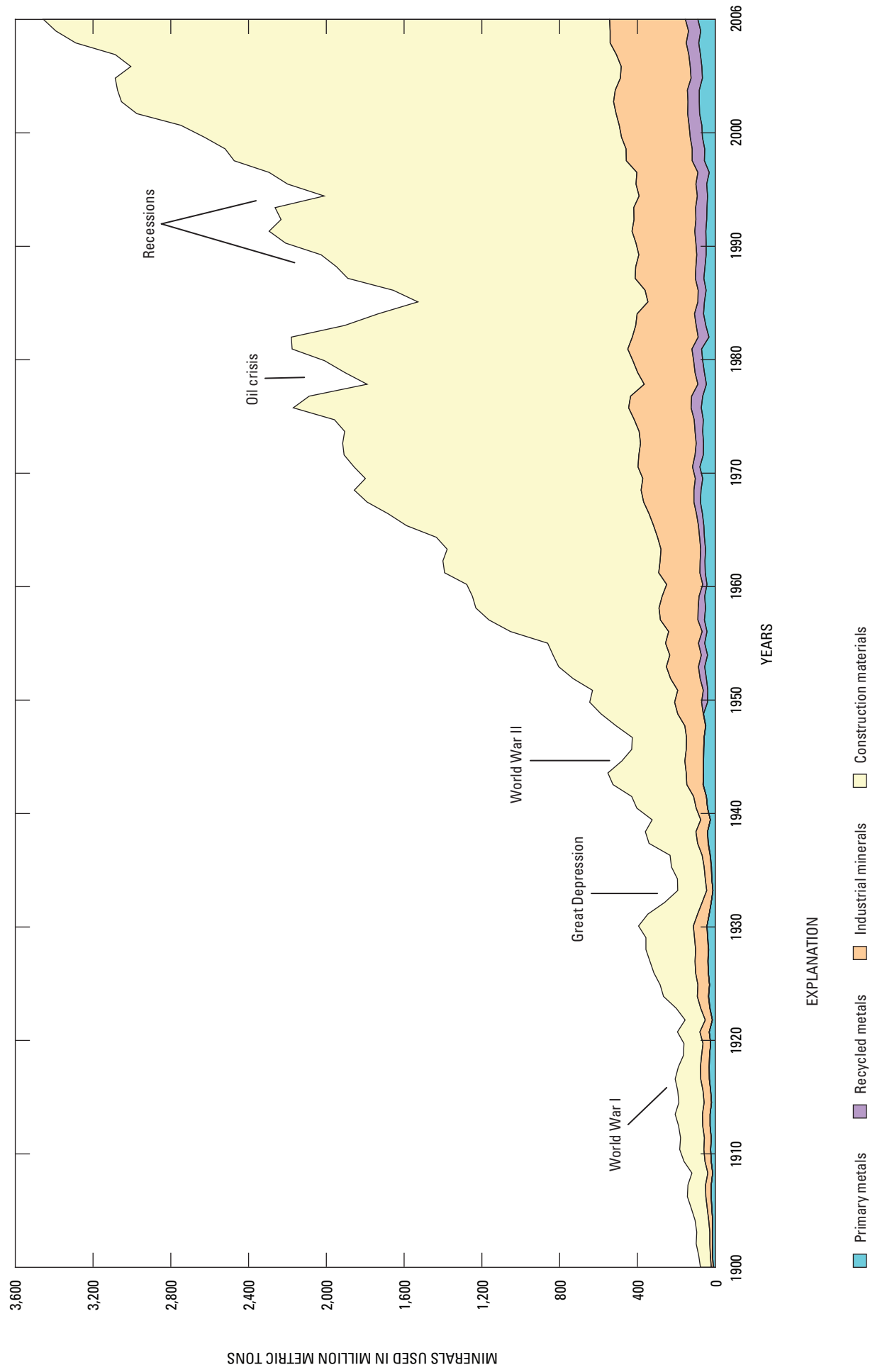


Figure 2. Minerals used for physical goods in the United States from 1900 through 2006. Minerals embedded in imported goods are not included. [In million of metric tons]

Agriculture	Forestry	Metals (includes recycling)	Minerals	Nonrenewable organics
Cotton	Paper and paperboard, all grades:	Aluminum	Abrasives, manufactured	Asphalt and road oil:
Cottonseed	Paper and paperboard, primary:	Antimony	Asbestos	All asphalts
Fishery	Insulating board	Arsenic	Barite	All road oils (grades 0 to 5)
Flax seed	Hardboard	Beryllium	Boron	Coal (1977–2006)
Fur	Wet machine board	Bismuth	Bromine	Coal for chemical use (1900–1976)
Leather hides	Recycled paper, secondary,	Cadmium	Cement	Lubricants:
Mohair	1960–2006:	Cesium	Clays	All lubricating oils
Natural rubber	Recovered paper at paper and	Chromium	Diamond, industrial	Lubricants in greases
Raw wool	paperboard mills	Cobalt	Diatomite	Liquefied petroleum gases (1980–2006)
Silk, raw and waste	Recovered paper for other uses	Copper	Feldspar	Miscellaneous oils, waxes, and other
Tobacco	Plywood and veneer	Gallium	Flourspar	products:
	Other forestry:	Germanium	Garnet, industrial	All waxes
	Cooperage	Gold	Gemstones	Absorption oil
	Fence posts	Indium	Graphite, natural	All other nonfuel oils
	Hewn ties	Iron and steel	Gypsum	Petrolatum
	Poles and piling	Lead	Hafnium	Natural gas for carbon black
	Other miscellaneous products	Magnesium	Helium	Pentanes plus (1984–2006)
	Wood	Manganese	Iron oxide pigments	Petrochemicals feedstock (1980–2006)
		Mercury	Kyanite and related materials	Petroleum coke
		Molybdenum	Lime	Primary products from petroleum and
		Nickel	Lithium	natural gas (1900–1979):
		Niobium (columbium)	Magnesium compounds	1,3-butadiene for rubber
		Platinum group	Mica	1-butene
		Rare earths	Nitrogen	Acetylene
		Rhenium	Peat	All other aromatics
		Selenium	Perlite	All other C4 hydrocarbons
		Silicon	Phosphate	All other C5 hydrocarbons
		Silver	Potash	Alpha olefins, C6–C10
		Tantalum	Pumice and pumicite	Benzene
		Tellurium	Quartz crystal	Butadiene and butylene fractions
		Thallium	Salt	Dodecene
		Tin	Sand and gravel, construction	Ethane, propane, butane
		Titanium	Sand and gravel, industrial	Ethylene
		Tungsten	Soda ash	Hexane
		Vanadium	Sodium sulfate	Higher alpha olefins
		Zinc	Stone, crushed	Isobutane
			Stone, dimension	Isobutylene
			Strontium	Isoprene
			Sulfur	n-Heptane
			Talc and pyrophyllite	Nonene
			Thorium	n-parrafin
			Titanium dioxide	Pentenes, mixed
			Vermiculite	Piperylene
			Wollastonite	Propylene
			Zirconium	Toulene
				Xylenes
				All others
				Special naphthas (1980–2006)

Figure 3. Minerals and materials used in the United States from 1900 through 2006, by category.