RARE EARTHS[1]

[Data in metric tons of rare-earth-oxide (REO) equivalent content unless otherwise noted]

Domestic Production and Use: Rare earths were mined domestically in 2019. Bastnaesite (or bastnäsite), a rare-earth fluorocarbonate mineral, was mined as a primary product at a mine in Mountain Pass, CA, which was restarted in the first quarter of 2018 after being put on care-and-maintenance status in the fourth quarter of 2015. Monazite, a phosphate mineral, was produced as a separated concentrate or included as an accessory mineral in heavy-mineral concentrates. The estimated value of rare-earth compounds and metals imported by the United States in 2019 was $170 million, an increase from $160 million in 2018. The estimated distribution of rare earths by end use was as follows: catalysts, 75%; metallurgical applications and alloys, 5%; ceramics and glass, 5%; polishing, 5%; and other, 10%.

Salient Statistics—United States:	2015	2016	2017	2018	2019[e]
Production, bastnaesite concentrates[e]	5,900	—	—	18,000	26,000
Imports:[2]					
Compounds	9,160	11,500	11,000	10,800	14,000
Metals:					
Ferrocerium, alloys	356	268	309	301	310
Rare-earth metals, scandium, and yttrium	385	404	524	527	590
Exports:[2]					
Ores and compounds	4,980	590	1,740	16,800	26,000
Metals:					
Ferrocerium, alloys	1,220	943	982	1,210	1,400
Rare-earth metals, scandium, and yttrium	60	103	55	28	100
Consumption, apparent[3]	9,550	10,500	9,060	11,600	13,000
Price, dollars per kilogram, average:[4]					
Cerium oxide, 99.5% minimum	3	2	2	2	2
Dysprosium oxide, 99.5% minimum	279	198	187	179	240
Europium oxide, 99.99% minimum	344	74	77	53	35
Lanthanum oxide, 99.5% minimum	3	2	2	2	2
Mischmetal, 65% cerium, 35% lanthanum	7	5	6	6	6
Neodymium oxide, 99.5% minimum	48	40	50	50	45
Terbium oxide, 99.99% minimum	564	415	501	455	510
Employment, mine and mill, annual average	351	—	24	190	220
Net import reliance[5] as a percentage of apparent consumption:[6]					
Compounds and metals	38	100	100	100	100
Mineral concentrates	XX	XX	XX	E	E

Recycling: Limited quantities of rare earths from batteries, permanent magnets, and fluorescent lamps are recycled.

Import Sources (2015–18): Rare-earth compounds and metals: China, 80%; Estonia, 6%; Japan and Malaysia, 3% each; and other, 8%. Compounds and metals imported from Estonia, Japan, and Malaysia were derived from mineral concentrates and chemical intermediates produced in Australia, China, and elsewhere.

Tariff: Item	Number	Normal Trade Relations 12–31–19
Rare-earth metals, scandium, and yttrium, whether or not intermixed or interalloyed	2805.30.0000	5.0% ad val.
Cerium compounds:		
Oxides	2846.10.0010	5.5% ad val.
Other	2846.10.0050	5.5% ad val.
Other rare-earth compounds:		
Lanthanum oxides	2846.90.2005	Free.
Other oxides	2846.90.2040	Free.
Lanthanum carbonates	2846.90.8070	3.7% ad val.
Other carbonates	2846.90.8075	3.7% ad val.
Other rare-earth compounds	2846.90.8090	3.7% ad val.
Ferrocerium and other pyrophoric alloys	3606.90.3000	5.9% ad val.

Depletion Allowance: Monazite, 22% on thorium content and 14% on rare-earth content (Domestic), 14% (Foreign); bastnäsite and xenotime, 14% (Domestic and foreign).

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RARE EARTHS

Government Stockpile:[7]

Material	Inventory As of 9–30–19	FY 2019 Potential Acquisitions	FY 2019 Potential Disposals	FY 2020 Potential Acquisitions	FY 2020 Potential Disposals
Cerium	—	—	—	900	—
Dysprosium	0.2	0.5	—	—	—
Europium	20.9	35	—	—	—
Ferrodysprosium, gross weight	0.5	—	—	—	—
Lanthanum, gross weight	—	—	—	4,100	—
Rare earths	—	416	—	—	—
Rare-earth-magnet feedstock	—	100	—	100	—
Yttrium oxide	25	10	—	—	—

Events, Trends, and Issues: Global mine production was estimated to have increased to 210,000 tons of rare-earth-oxide equivalent, an 11% increase compared with that of 2018. In the United States, domestic production of mineral concentrates, all of which were exported, increased to 26,000 tons, a 44% increase compared with that of 2018. China continued to dominate the global supply of rare earths. According to China's Ministry of Industry and Information Technology, the mine and separation production quotas for 2019 were 132,000 tons and 127,000 tons, respectively.

World Mine Production and Reserves: Reserves for Canada, Greenland, Tanzania, and South Africa were previously included with "Other countries."

	Mine production[e] 2018	Mine production[e] 2019	Reserves[8]
United States	18,000	26,000	1,400,000
Australia	21,000	21,000	[9]3,300,000
Brazil	1,100	1,000	22,000,000
Burma (Myanmar)	19,000	22,000	NA
Burundi	630	600	NA
Canada	—	—	830,000
China	[10]120,000	[10]132,000	44,000,000
Greenland	—	—	1,500,000
India	2,900	3,000	6,900,000
Madagascar	2,000	2,000	NA
Russia	2,700	2,700	12,000,000
South Africa	—	—	790,000
Tanzania	—	—	890,000
Thailand	1,000	1,800	NA
Vietnam	920	900	22,000,000
Other countries	60	—	310,000
World total (rounded)	190,000	210,000	120,000,000

World Resources: Rare earths are relatively abundant in the Earth's crust, but minable concentrations are less common than for most other ores. In North America, measured and indicated resources of rare earths were estimated to include 2.7 million tons in the United States and more than 15 million tons in Canada.

Substitutes: Substitutes are available for many applications but generally are less effective.

[e]Estimated. E Net exporter. NA Not available. XX Not applicable. — Zero.

[1]Data include lanthanides and yttrium but exclude most scandium. See also Scandium and Yttrium.

[2]REO equivalent or content of various materials were estimated. Source: U.S. Census Bureau.

[3]Defined as production + imports – exports.

[4]Price range from Argus Media group – Argus Metals International.

[5]Defined as imports – exports.

[6]In 2015, domestic production of mineral concentrates was included with apparent consumption of compounds and metals. In 2018 and 2019, all domestic production of mineral concentrates was exported, and all compounds and metals consumed were assumed to be imported material.

[7]See Appendix B for definitions.

[8]See Appendix C for resource and reserve definitions and information concerning data sources.

[9]For Australia, Joint Ore Reserves Committee-compliant reserves were 1.9 million tons.

[10]Production quota; does not include undocumented production.