

## RARE EARTHS<sup>1</sup>

[Data in metric tons, rare-earth-oxide (REO) equivalent, unless otherwise specified]

**Domestic Production and Use:** Rare earths were mined and processed domestically in 2024. An estimated 45,000 tons of REO in mineral concentrates were produced and were valued at \$260 million. Bastnaesite (or bastnaesite), a rare-earth fluorocarbonate mineral, was mined as a primary product at a mine in Mountain Pass, CA. Monazite, a phosphate mineral, was stockpiled as a separated concentrate or included as an accessory mineral in heavy-mineral-sand concentrates in the southeastern United States. Mixed rare-earth compounds also were produced in the Western United States. The estimated value of rare-earth compounds and metals imported by the United States in 2024 was \$170 million, an 11% decrease from \$186 million in 2023. The estimated leading domestic end use of rare earths was catalysts. Significant amounts of rare earths are imported as permanent magnets embedded in finished goods. Other end uses were ceramics and glass, metallurgical applications and alloys, and polishing.

<b>Salient Statistics—United States:</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024<sup>e</sup></b>
Production: <sup>e</sup>					
Mineral concentrates <sup>2</sup>	39,000	42,400	42,500	41,600	45,000
Compounds and metals	—	120	95	250	1,300
Imports: <sup>e, 3</sup>					
Compounds	6,510	7,690	10,700	8,920	8,000
Metals:					
Ferrocerium, alloys	270	330	395	259	220
Rare-earth metals, scandium, and yttrium	363	580	487	476	90
Exports: <sup>e, 3</sup>					
Ores and compounds	40,000	44,200	45,900	20,700	43,000
Metals:					
Ferrocerium, alloys	626	825	1,520	817	1,100
Rare-earth metals, scandium, and yttrium	25	20	24	63	320
Consumption, apparent, compounds and metals <sup>4</sup>	6,490	7,900	10,200	10,100	6,600
Price, average, dollars per kilogram: <sup>5</sup>					
Cerium oxide, 99.5% minimum	2	2	1	1	1
Dysprosium oxide, 99.5% minimum	261	410	382	330	260
Europium oxide, 99.99% minimum	31	31	30	27	27
Lanthanum oxide, 99.5% minimum	2	2	1	1	1
Mischmetal, 65% cerium, 35% lanthanum	5	6	7	5	5
Neodymium oxide, 99.5% minimum	49	98	134	78	56
Terbium oxide, 99.99% minimum	670	1,346	2,051	1,298	810
Employment, mine and mill, annual average, number	185	293	350	450	570
Net import reliance <sup>6</sup> as a percentage of apparent consumption: <sup>7</sup>					
Compounds and metals	100	>95	>95	>95	80
Mineral concentrates	E	E	E	E	E

**Recycling:** Limited quantities of rare earths were recovered from batteries, permanent magnets, and fluorescent lamps.

**Import Sources (2020–23):** Rare-earth compounds and metals: China,<sup>8</sup> 70%; Malaysia, 13%; Japan, 6%; Estonia, 5%; and other, 6%. Compounds and metals imported from Estonia, Japan, and Malaysia were derived from mineral concentrates and chemical intermediates produced in Australia, China, and elsewhere.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b><u>12–31–24</u></b>
	Rare-earth metals	2805.30.0000	5% ad valorem.
	Cerium compounds	2846.10.0000	5.5% ad valorem.
	Other rare-earth compounds:		
	Oxides or chlorides	2846.90.2000	Free.
	Carbonates	2846.90.8000	3.7% ad valorem.
	Ferrocerium and other pyrophoric alloys	3606.90.3000	5.9% ad valorem.

**Depletion Allowance:** Monazite, 22% on thorium content and 14% on rare-earth content (domestic), 14% (foreign); bastnaesite and xenotime, 14% (domestic and foreign).

## RARE EARTHS

**Government Stockpile:**<sup>9</sup> In the addition to the materials listed below, the fiscal year (FY) 2024 and 2025 potential acquisitions included varying amounts of neodymium-praseodymium oxide, neodymium-iron-boron magnet block, and samarium-cobalt alloy.

<u>Material</u>	FY 2024		FY 2025	
	<u>Potential acquisitions</u>	<u>Potential disposals</u>	<u>Potential acquisitions</u>	<u>Potential disposals</u>
Cerium	550	—	—	—
Lanthanum	1,300	—	1,100	—

**Events, Trends, and Issues:** Global mine production was estimated to have increased to 390,000 tons of REO equivalent largely owing to increased mining and processing in China, Nigeria, and Thailand.

**World Mine Production and Reserves:** Reserves for Russia, South Africa, the United States, and Vietnam were revised based on company and Government reports.

	Mine production <sup>e</sup>		Reserves <sup>10</sup>
	<u>2023</u>	<u>2024</u>	
United States	41,600	45,000	1,900,000
Australia	<sup>11</sup> 16,000	<sup>11</sup> 13,000	<sup>12</sup> 5,700,000
Brazil	140	20	21,000,000
Burma	<sup>11</sup> 43,000	<sup>11</sup> 31,000	NA
Canada	—	—	830,000
China	<sup>13</sup> 255,000	<sup>13</sup> 270,000	44,000,000
Greenland	—	—	1,500,000
India	2,900	2,900	6,900,000
Madagascar	<sup>11</sup> 2,100	<sup>11</sup> 2,000	NA
Malaysia	<sup>11</sup> 310	<sup>11</sup> 130	NA
Nigeria	<sup>11</sup> 7,200	<sup>11</sup> 13,000	NA
Russia	2,500	2,500	3,800,000
South Africa	—	—	860,000
Tanzania	—	—	890,000
Thailand	<sup>11</sup> 3,600	<sup>11</sup> 13,000	4,500
Vietnam	<sup>11</sup> 300	<sup>11</sup> 300	3,500,000
Other	<u>1,440</u>	<u>1,100</u>	<u>NA</u>
World total (rounded)	376,000	390,000	>90,000,000

**World Resources:**<sup>10</sup> Rare earths are relatively abundant in the Earth's crust, but minable concentrations are less common than for most other mineral commodities. In North America, measured and indicated resources of rare earths were estimated to include 3.6 million tons in the United States and more than 14 million tons in Canada.

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

<sup>e</sup>Estimated. E Net exporter. NA Not available. — Zero.

<sup>1</sup>Data include lanthanides and yttrium but exclude most scandium. See also the Scandium and Yttrium chapters.

<sup>2</sup>Excludes monazite concentrates for 2021–24.

<sup>3</sup>REO equivalent or content of various materials were estimated. Source: U.S. Census Bureau.

<sup>4</sup>Defined as production + imports – exports.

<sup>5</sup>Source: Argus Media Group, Argus Non-Ferrous Markets.

<sup>6</sup>Defined as imports – exports.

<sup>7</sup>In 2020, all domestic production of mineral concentrates was exported or held in inventory, and all compounds and metals consumed were assumed to be imported material.

<sup>8</sup>Includes Hong Kong.

<sup>9</sup>Gross weight. See Appendix B for definitions.

<sup>10</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>11</sup>Estimated based on reported import data for China. Source: Zen Innovations, Global Trade Tracker.

<sup>12</sup>For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 3.3 million tons.

<sup>13</sup>Production quota; does not include undocumented production.