ZINC
(Data in thousand metric tons of zinc content unless otherwise noted)

Domestic Production and Use: The value of zinc mined in 2016, based on zinc contained in concentrate, was about $1.70 billion. Zinc was mined in 5 States at 12 mines operated by 4 companies. Three smelter facilities, one primary and two secondary, operated by two companies, produced commercial-grade zinc metal. Of the total reported zinc consumed, most was used in galvanizing, followed by brass and bronze, zinc-based alloys, and other uses.

Production:
Zinc in ore and concentrate 738 784 832 825 780
Refined zinc 261 233 180 172 140
Imports for consumption:
Zinc in ore and concentrate 6 3 (2) (2) (2)
Refined zinc 655 713 805 771 710
Exports:
Zinc in ore and concentrate 591 669 644 709 500
Refined zinc 14 12 20 13 70
Shipments from Government stockpile — — — — —
Consumption, apparent, refined zinc 902 935 965 931 780

Price, average, cents per pound:
North American 95.8 95.6 107.1 95.5 99.0
London Metal Exchange (LME), cash 88.3 86.6 98.1 87.6 92.0

Reported producer and consumer stocks, refined zinc, yearend 74 74 88 91 80

Employment:
Mine and mill, number 2,310 2,560 2,620 2,680 2,320
Smelter, primary, number 252 257 259 250 250

Net import reliance as a percentage of apparent consumption (refined zinc) 71 75 81 81 82

Recycling: In 2016, about 25% (35,000 tons) of the refined zinc produced in the United States was recovered from secondary materials at both primary and secondary smelters. Secondary materials included galvanizing residues and crude zinc oxide recovered from electric arc furnace dust.

Import Sources (2012–15): Ore and concentrate: Canada, 69%; Mexico, 31%. Refined metal: Canada, 63%; Mexico, 13%; Australia, 10%; Peru, 7%; and other, 7%. Waste and scrap: Canada, 75%; Mexico, 23%; and other, 2%. Combined total: Canada, 64%; Mexico, 14%; Australia, 9%; Peru, 7%; and other, 6%.

Tariff: Item Number Normal Trade Relations 12–31–16
Zinc ores and concentrates, Zn content 2608.00.0030 Free.
Zinc oxide; zinc peroxide 2817.00.0000 Free.
Unwrought zinc, not alloyed:
Containing 99.99% or more zinc 7901.11.0000 1.5% ad val.
Containing less than 99.99% zinc:
Casting-grade 7901.12.1000 3% ad val.
Other 7901.12.5000 1.5% ad val.
Zinc alloys 7901.20.0000 3% ad val.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile:

Stockpile Status—9–30–16

<table>
<thead>
<tr>
<th>Material</th>
<th>Inventory</th>
<th>Disposal Plan FY 2016</th>
<th>Disposals FY 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7</td>
<td>7</td>
<td>—</td>
</tr>
</tbody>
</table>

Prepared by Amy C. Tolcin [(703) 648–4940, atolcin@usgs.gov]
Events, Trends, and Issues: Global zinc mine production in 2016 was 11.9 million tons, 7% less than that of 2015. Zinc mine production in Australia decreased by almost 50% as a result of the closure of the Century Mine in 2015 owing to reserves depletion and temporary production cutbacks at the George Fisher and Lady Loretta Mines. In a reversal from 2015, when production exceeded consumption, the zinc metal market fell into a sizable deficit during 2016, with consumption exceeding production. According to the International Lead and Zinc Study Group, global refined zinc production in 2016 decreased by 3% to 13.22 million tons, and metal consumption was essentially unchanged at 13.57 million tons, resulting in a production-to-consumption deficit of 349,000 tons of refined zinc. Domestic zinc mine production decreased by 5% in 2016 owing mostly to a decrease in production in Tennessee; in December 2015, the Middle Tennessee Mines (50,000-ton-per-year capacity) were closed in response to low zinc prices at the time. Refined zinc production decreased by 19% as a result of a decline in secondary zinc production; in January, the zinc recycling facility in Mooresboro, NC (140,000-ton-per-year capacity) closed as a result of low zinc prices and ongoing equipment and technical issues. A 16% decrease in calculated apparent consumption, as reflected by lower domestic refined production and imports, was thought to be artificially low, owing to a significant drawdown in unreported consumer and merchant stocks.

Coincident with increased investment interest and the growing production to consumption deficit, the monthly average North American Special High Grade zinc price increased by almost 50% in the first 9 months of 2016 to an average of $1.10 per pound in September from $0.75 per pound in January.

World Mine Production and Reserves: Reserves estimates for Bolivia, Canada, Kazakhstan, Mexico, and other countries were revised based on company data. The reserves estimate for China was revised based on data from Government reports.

<table>
<thead>
<tr>
<th></th>
<th>Mine production</th>
<th>Reserves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
<td>2016*</td>
</tr>
<tr>
<td>United States</td>
<td>825</td>
<td>780</td>
</tr>
<tr>
<td>Australia</td>
<td>1,600</td>
<td>850</td>
</tr>
<tr>
<td>Bolivia</td>
<td>440</td>
<td>460</td>
</tr>
<tr>
<td>Canada</td>
<td>277</td>
<td>310</td>
</tr>
<tr>
<td>China</td>
<td>4,300</td>
<td>4,500</td>
</tr>
<tr>
<td>India</td>
<td>821</td>
<td>650</td>
</tr>
<tr>
<td>Ireland</td>
<td>236</td>
<td>150</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>339</td>
<td>340</td>
</tr>
<tr>
<td>Mexico</td>
<td>680</td>
<td>710</td>
</tr>
<tr>
<td>Peru</td>
<td>1,420</td>
<td>1,300</td>
</tr>
<tr>
<td>Sweden</td>
<td>247</td>
<td>250</td>
</tr>
<tr>
<td>Other countries</td>
<td>1,610</td>
<td>1,600</td>
</tr>
<tr>
<td>World total (rounded)</td>
<td>12,800</td>
<td>11,900</td>
</tr>
</tbody>
</table>

World Resources: Identified zinc resources of the world are about 1.9 billion tons.

Substitutes: Aluminum and plastics substitute for galvanized sheet in automobiles; and aluminum alloys, cadmium, paint, and plastic coatings replace zinc coatings in other applications. Aluminum- and magnesium-based alloys are major competitors for zinc-based die-casting alloys. Many elements are substitutes for zinc in chemical, electronic, and pigment uses.

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9Estimated. — Zero.
1Includes primary and secondary refined production.
2Less than ¼ unit.
3Defined as refined production + refined imports – refined exports + adjustments for Government stock changes.
4Platts Metals Week price for North American SHG zinc; based on the LME cash price plus premium.
5Includes mine and mill employment at all zinc-producing mines. Source: Mine Safety and Health Administration.
6Defined as imports – exports + adjustments for Government stock changes.
7See Appendix B for definitions.
9Zinc content of concentrate and direct shipping ore.
10See Appendix C for resource and reserve definitions and information concerning data sources.
11For Australia, Joint Ore Reserves Committee-compliant reserves were about 24 million tons.