

Mineral Industry Surveys

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COBALT IN DECEMBER 2022

The amount of cobalt contained in U.S. imports of cobalt metals and chemicals in December 2022 was 12% more than that imported during November 2022. In 2022, cobalt imports totaled 10,500 metric tons (t) of contained cobalt, a 7% increase from 9,800 t in 2021. Based on contained cobalt, the following four countries supplied 69% of U.S. imports in 2022: Norway, 25%; Finland, 19%; Canada, 13%; and Japan, 12% (table 2).

The amount of cobalt contained in U.S. exports of unwrought cobalt and chemicals in December 2022 was 14% less than that exported during November 2022. In 2022, cobalt exports totaled 5,360 t of contained cobalt, a 9% increase from 4,930 t in 2021 (table 4).

Prices

During the past 2 years, London Metal Exchange (LME) stocks trended downward until October 2022 and then remained essentially unchanged through yearend. Monthly average cobalt prices fluctuated but generally trended upward into the second quarter of 2022 before sharply declining to annual year-to-date

lows in August. From September to December, monthly average LME cash mean prices remained unchanged. The December 2022 monthly average LME cash mean price was 26% lower than that in December 2021. Monthly average U.S. spot prices reported by S&P Global Platts Metals Week trended upward from August to October, then sharply declined through yearend (fig. 1, table 1). In December, the monthly average U.S. spot cobalt price decreased by 12% from that in November 2022 and was 37% lower than that in December 2021. The following listed prices are for cobalt metal in December, in dollars per pound.

| Type | Price range | Average price |
|----------------------------|-------------|---------------|
| U.S. spot ¹ | 18.75–23.85 | 20.61 |
| LME cash mean ² | 23.24–23.25 | 23.24 |

¹Source: S&P Global Platts Metals Week, minimum 99.8% cobalt cathode.

²London Metal Exchange, mean of the cash buyer and cash seller price, minimum 99.3% cobalt briquettes, cathode, ingot, or rounds (converted from dollars per metric ton and rounded to the nearest cent).

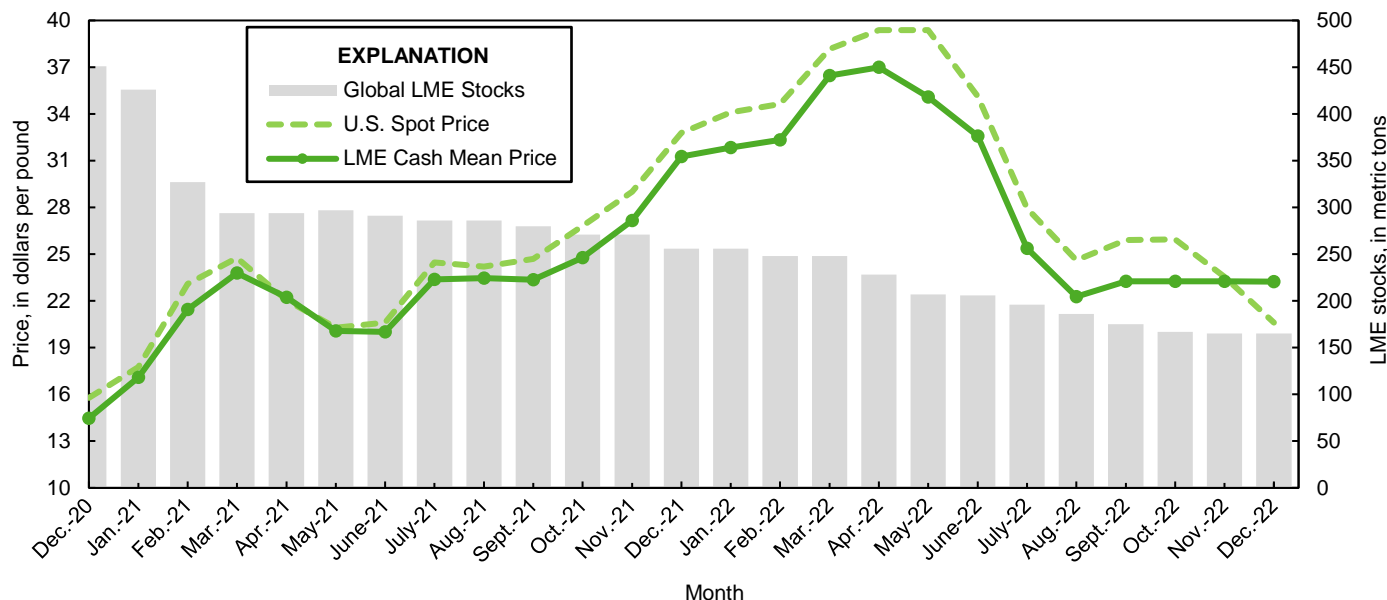


Figure 1. Global LME cobalt stocks, average U.S. spot cobalt prices, and average LME cash mean cobalt prices for December 2020 through December 2022. Sources: S&P Global Platts Metals Week and London Metal Exchange.

In 2022, the annual average U.S. spot price was \$30.78 per pound, 27% higher than the \$24.21 per pound in 2021 and the annual average LME cash mean price was \$28.83, 24% higher than the \$23.17 in 2021.

Annual Review of U.S. Mine Production

Preliminary estimated U.S. cobalt mine production in 2022 was 800 t of cobalt in concentrate, 23% more than estimated production of 650 t in 2021. In 2022, the Lundin Mining Corp. (Canada) nickel-copper Eagle Mine on the Upper Peninsula of Michigan produced cobalt-bearing nickel concentrate. Missouri Cobalt, LLC produced a nickel-copper-cobalt concentrate from a tailings reprocessing operation at the former Madison lead, copper, nickel, and cobalt mine near Fredericktown, MO. Sibanye Stillwater Ltd. (South Africa) recovered negligible amounts of cobalt in crude nickel sulfate from ores mined at its Stillwater and East Boulder platinum-group metals operations in southern Montana. At yearend, a fourth operation—the Jervois Global Ltd. (Australia) Idaho Cobalt Operations cobalt-copper-gold mine near Salmon, ID—was nearly finished with initial

mine development. Jervois was planning to begin final plant commissioning and commercial production of cobalt concentrate by March 31, 2023 (Jervois Global Ltd., 2023, p. 1, 3; Shedd, 2023).

References Cited

- Jervois Global Ltd., 2023, Quarterly activities report to 31 December 2022: Cremorne, Victoria, Australia, Jervois Global Ltd., January 30, 27 p. (Accessed February 7, 2023, at <https://wcsecure.weblink.com.au/pdf/JRV/02624884.pdf>.)
- Shedd, K.B., 2023, Cobalt: U.S. Geological Survey Mineral Commodity Summaries 2023, p. 60–61. (Accessed February 7, 2023, at <https://pubs.usgs.gov/periodicals/mcs2023/mcs2023-cobalt.pdf>.)

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TABLE 1
REPORTED STOCKS OF COBALT METAL, END OF PERIOD

(Metric tons, contained cobalt)

| Period | U.S. Government ¹ | LME ² | | Total |
|----------------|---------------------------------|-------------------|-----------------------|-------|
| | | U.S. warehouse | Non-U.S. warehouse | |
| 2021, December | 302 | 50 | 206 | 256 |
| 2022: | | | | |
| January | 302 | 50 | 206 | 256 |
| February | 302 | 54 | 194 | 248 |
| March | 302 | 54 | 194 | 248 |
| April | 302 | 54 | 174 | 228 |
| May | 302 | 39 | 168 | 207 |
| June | 302 | 39 | 167 | 206 |
| July | 302 | 39 | 157 | 196 |
| August | 302 | 39 | 147 | 186 |
| September | 302 | 34 | 141 | 175 |
| October | 302 | 34 | 133 | 167 |
| November | 302 | 34 | 131 | 165 |
| December | 302 | 34 | 131 | 165 |

¹Data from Defense Logistics Agency Strategic Materials.

²London Metal Exchange.

TABLE 2
U.S. IMPORTS FOR CONSUMPTION OF COBALT, BY COUNTRY OR LOCALITY¹

| Period and country or locality of origin | Metals ² | | Oxides and hydroxides | | Salts and compounds ³ | | Total cobalt content for the period ⁴ (metric tons) | Cobalt content, year to date ^{4,5} (metric tons) |
|---|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|---|---|
| | Gross weight (metric tons) | Value ⁶ (thousands) | Gross weight (metric tons) | Value ⁶ (thousands) | Gross weight (metric tons) | Value ⁶ (thousands) | | |
| 2021: | | | | | | | | |
| December | 440 | \$25,500 | 169 | \$6,410 | 410 | \$5,070 | 679 | 9,800 |
| January–December | 7,210 | 323,000 | 2,220 | 74,700 | 3,320 | 40,400 | 9,800 | XX |
| 2022: | | | | | | | | |
| January | 754 | 44,600 | 84 | 3,540 | 148 | 2,860 | 859 | 859 |
| February | 440 | 24,800 | 161 | 7,460 | 382 | 3,790 | 667 | 1,530 |
| March | 648 | 42,400 | 256 | 11,400 | 1,040 | 6,200 | 1,110 | 2,640 |
| April | 343 | 24,000 | 193 | 10,100 | 487 | 4,040 | 624 | 3,260 |
| May | 900 | 68,900 | 211 | 10,800 | 1,290 | 6,910 | 1,410 | 4,670 |
| June | 504 | 38,300 | 160 | 8,640 | 992 | 5,750 | 890 | 5,560 |
| July | 685 | 50,500 | 193 | 10,500 | 1,430 | 7,190 | 1,210 | 6,770 |
| August | 530 | 36,900 | 134 | 6,130 | 153 | 2,010 | 671 | 7,440 |
| September | 578 | 34,600 | 200 | 7,120 | 310 | 4,410 | 827 | 8,270 |
| October | 579 | 29,600 | 117 | 5,030 | 200 | 2,550 | 725 | 8,990 |
| November | 571 | 29,100 | 109 | 4,990 | 260 | 2,810 | 721 | 9,710 |
| December: | | | | | | | | |
| Australia | 100 | 5,410 | -- | -- | -- | -- | 100 | 153 |
| Belgium | -- | -- | 10 | 423 | -- | -- | 7 | 271 |
| Brazil | -- | -- | -- | -- | 144 | 1,020 | 41 | 248 |
| Canada | 283 | 15,400 | -- | -- | -- | -- | 283 | 1,390 |
| China | 15 | 255 | 17 | 302 | (7) | 2 | 27 | 174 |
| Finland | (7) | 36 | 22 | 732 | 9 | 104 | 19 | 2,050 |
| France | 1 | 64 | -- | -- | -- | -- | 1 | 6 |
| Germany | 3 | 196 | -- | -- | -- | -- | 3 | 167 |
| Hong Kong | -- | -- | -- | -- | -- | -- | -- | 49 |
| India | -- | -- | -- | -- | 15 | 124 | 4 | 28 |
| Italy | -- | -- | 1 | 41 | -- | -- | 1 | 6 |
| Japan | 125 | 6,410 | -- | -- | -- | -- | 125 | 1,270 |
| Korea, Republic of | (7) | 6 | -- | -- | -- | -- | (7) | 68 |
| Madagascar | -- | -- | -- | -- | -- | -- | -- | 252 |
| Mexico | -- | -- | -- | -- | -- | -- | -- | 30 |
| Morocco | 20 | 1,020 | -- | -- | -- | -- | 20 | 195 |
| Netherlands | -- | -- | -- | -- | -- | -- | -- | 17 |
| Norway | 104 | 5,090 | -- | -- | -- | -- | 104 | 2,580 |
| Russia | -- | -- | -- | -- | -- | -- | -- | 455 |
| South Africa | 16 | 126 | -- | -- | -- | -- | 16 | 224 |
| Spain | -- | -- | -- | -- | -- | -- | -- | 6 |
| Taiwan | -- | -- | 38 | 1,440 | 23 | 356 | 33 | 260 |
| Turkey | 8 | 206 | -- | -- | -- | -- | 8 | 32 |
| United Kingdom | 3 | 221 | 12 | 460 | 6 | 88 | 13 | 536 |
| Zambia | -- | -- | -- | -- | -- | -- | -- | 54 |
| Other | -- | -- | (7) | 4 | -- | -- | (7) | 6 |
| Total | 678 | 34,400 | 100 | 3,400 | 197 | 1,700 | 805 | 10,500 |
| January–December | 7,210 | 458,000 | 1,920 | 89,100 | 6,900 | 50,200 | 10,500 | XX |

XX Not applicable. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Unwrought cobalt, excluding alloys; includes cobalt cathode and cobalt metal powder; may include intermediate products of cobalt metallurgy.

³Includes cobalt acetates, cobalt carbonates, cobalt chlorides, and cobalt sulfates.

⁴Estimated from gross weights.

⁵May include revisions to previously published data.

⁶Customs value.

⁷Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF ADDITIONAL COBALT MATERIALS, BY COUNTRY OR LOCALITY¹

| Period and country or locality of origin | Unwrought cobalt alloys | | Cobalt waste and scrap | | Wrought cobalt and cobalt articles | |
|---|----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|
| | Gross weight (metric tons) | Value ² (thousands) | Gross weight (metric tons) | Value ² (thousands) | Gross weight (metric tons) | Value ² (thousands) |
| 2021: | | | | | | |
| December | 30 | \$1,460 | 135 | \$1,200 | 32 | \$4,710 |
| January–December | 210 | 9,800 | 1,560 | 19,800 | 315 | 45,500 |
| 2022: | | | | | | |
| January | 51 | 2,440 | 163 | 1,840 | 53 | 5,770 |
| February | 19 | 1,020 | 79 | 1,390 | 16 | 3,060 |
| March | 6 | 326 | 189 | 2,980 | 44 | 4,830 |
| April | 21 | 1,240 | 192 | 2,830 | 27 | 3,200 |
| May | 24 | 1,400 | 175 | 2,340 | 42 | 4,720 |
| June | 25 | 1,690 | 155 | 2,070 | 44 | 4,980 |
| July | 29 | 1,760 | 99 | 2,060 | 38 | 4,080 |
| August | 33 | 1,730 | 152 | 2,530 | 27 | 3,940 |
| September | 35 | 1,780 | 200 | 2,850 | 33 | 4,210 |
| October | 32 | 1,730 | 133 | 2,200 | 42 | 3,790 |
| November | 31 | 1,670 | 114 | 1,640 | 33 | 4,490 |
| December: | | | | | | |
| Austria | (3) | 5 | -- | -- | 1 | 143 |
| Belgium | 2 | 87 | 4 | 179 | -- | -- |
| Canada | 5 | 255 | 1 | 12 | 3 | 1,030 |
| China | (3) | 6 | 1 | 9 | 1 | 339 |
| France | -- | -- | 7 | 265 | 9 | 663 |
| Germany | -- | -- | (3) | 4 | 5 | 559 |
| Ireland | -- | -- | 23 | 16 | (3) | 31 |
| Korea, Republic of | -- | -- | 1 | 22 | (3) | 3 |
| Tunisia | -- | -- | 9 | 69 | -- | -- |
| United Kingdom | 32 | 1,620 | 44 | 1,410 | 16 | 1,710 |
| Other | -- | -- | (3) | 12 | 1 | 295 |
| Total | 39 | 1,970 | 90 | 1,990 | 36 | 4,780 |
| January–December | 344 | 18,800 | 1,740 | 26,700 | 434 | 51,800 |

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Customs value.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 4
U.S. EXPORTS OF COBALT MATERIALS¹

| Period | Unwrought cobalt, powders, matte, waste and scrap ² | | Oxides and hydroxides | | Salts and compounds ³ | | Total cobalt content for the period ⁴ (metric tons) | Cobalt content, year to date ^{4,5} (metric tons) |
|------------------|--|-----------------------------------|-------------------------------|-----------------------------------|----------------------------------|-----------------------------------|---|--|
| | Gross weight (metric tons) | Value ⁶ (thousands) | Gross weight (metric tons) | Value ⁶ (thousands) | Gross weight (metric tons) | Value ⁶ (thousands) | | |
| 2021: | | | | | | | | |
| December | 333 | \$10,000 | 2 | \$96 | -- | -- | 335 | 4,930 |
| January–December | 4,900 | 139,000 | 43 | 1,060 | 9 | \$133 | 4,930 | XX |
| 2022: | | | | | | | | |
| January | 454 | 14,400 | 2 | 83 | -- | -- | 456 | 456 |
| February | 293 | 11,600 | 1 | 50 | -- | -- | 293 | 749 |
| March | 597 | 16,600 | 3 | 94 | -- | -- | 599 | 1,350 |
| April | 378 | 13,200 | 1 | 44 | (7) | 5 | 379 | 1,730 |
| May | 493 | 17,600 | 7 | 304 | -- | -- | 498 | 2,220 |
| June | 400 | 12,200 | 2 | 79 | (7) | 6 | 402 | 2,630 |
| July | 381 | 14,600 | 3 | 145 | -- | -- | 384 | 3,010 |
| August | 410 | 12,000 | 7 | 297 | (7) | 4 | 416 | 3,430 |
| September | 344 | 12,200 | 7 | 298 | -- | -- | 349 | 3,780 |
| October | 584 | 16,900 | 2 | 64 | -- | -- | 585 | 4,360 |
| November | 529 | 13,900 | 7 | 281 | -- | -- | 535 | 4,890 |
| December | 460 | 13,600 | 1 | 31 | -- | -- | 460 | 5,360 |
| January–December | 5,320 | 169,000 | 43 | 1,770 | 1 | 16 | 5,360 | XX |

XX Not applicable. -- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²May include other intermediate products of cobalt metallurgy and unwrought cobalt alloys.

³Cobalt acetates and cobalt chlorides.

⁴Estimated from gross weights.

⁵May include revisions to previously published data.

⁶Free alongside ship (f.a.s.) value.

⁷Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF WROUGHT COBALT, COBALT ORE,
AND CONCENTRATES¹

| Period | Wrought cobalt and cobalt articles | | Cobalt ore and concentrates | |
|------------------|---------------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| | Gross weight (metric tons) | Value ² (thousands) | Gross weight (metric tons) | Value ² (thousands) |
| 2021: | | | | |
| December | 217 | \$18,600 | (3) | \$4 |
| January–December | 1,820 | 170,000 | 2 | 26 |
| 2022: | | | | |
| January | 139 | 15,400 | -- | -- |
| February | 103 | 13,300 | -- | -- |
| March | 105 | 15,300 | -- | -- |
| April | 204 | 19,200 | (3) | 4 |
| May | 143 | 16,600 | -- | -- |
| June | 164 | 16,400 | -- | -- |
| July | 201 | 23,000 | -- | -- |
| August | 114 | 18,500 | -- | -- |
| September | 185 | 25,500 | (3) | 8 |
| October | 121 | 17,200 | -- | -- |
| November | 181 | 24,300 | -- | -- |
| December | 182 | 21,000 | -- | -- |
| January–December | 1,840 | 226,000 | (3) | 12 |

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Free alongside ship (f.a.s.) value.

³Less than ½ unit.

Source: U.S. Census Bureau.