Anders Hallberg (Geological Survey of Sweden) 18 April 2012
Update by Pasi Eilu (Geological Survey of Finland), 8 April 2019
Helge Reginiussen (Geological Survey of Sweden) 7 December 2022

Commodity	**Indium (In)**	**Data source**
Significance for the EU (2023)	*Not Critical nor Strategic*	
Uses of the commodity	Main uses: *Flat panel displays 60 %, Low temperature solders 11 %, Solar panels (CIGS PV cells) 9 %* Minor uses: *Thermal interface material, batteries, alloys, semiconductors, LEDs and laser diodes* Future uses: *Current uses may prevail; share of solar panels may increase*	Mudd et al. (2017), Werner et al. (2017), Latunussa et al. (2020), USGS (2023)
Resources and potential in Nordic countries	*There are no known primary indium ores in the Nordic countries (such ores are globally rare). Trace amounts of In are present in base metal sulphide ores, particularly in zinc ores. The potential resources of In in zinc-rich massive sulphide deposits in the Fennoscandian shield and greisen type W-Sn-Bi mineralization in Greenland are probably large, but quantitative data for the In content are generally missing. Indium can be, but is not commonly, recovered during the smelting process.*	Jonsson et al. (2013), Werner et al. (2015, 2017), Stensgaard et al. (2016), Mudd et al. (2017), Latunussa et al. (2020), Eilu et al (2021)
Anthropogenic resources and potential in Nordic countries	*Recycled LCD-displays, zinc mine and refinery tailings*	
Main deposit types in Nordic countries	*Zinc-dominated massive sulphide ores*	
Main global deposit types	*Zinc-dominated VMS, skarn, SEDEX and MVT Zn-Pb, and, some polymetallic epithermal deposits, porphyry Mo-W, and tin ores. Only extracted as a minor by-product.*	Werner et al. (2017), Goldfarb et al. (2017), Monecke et al. (2017)
Global production (2022)	*900 t In from primary refinery production. Mine production not known.*	USGS (2023)
Nordic production (2022)	*No mine production*	
Main producing countries (2022)	*China 58.9 %, Republic of Korea 22.2 %, Japan 7.3 %, Canada 6.1 %, France 2.2 %, Belgium 2.2 % (all figures are refinery production)*	USGS (2023)
Technological challenges in production	*Only a few smelters are capable of extracting indium and those that are capable have a low rate of recovery*	Mudd et al. (2017), Werner et al. (2015, 2017)
Recycling	Present: *Most commonly recovered from indium-tin-oxide (ITO) manufacturing waste. Detailed data on the amount recovered from waste are not available, but are estimated to be similar to primary production.*	Latunussa et al. (2020), USGS (2022)

Future:
Assumed to increase when large volumes of flat panel screens and solar cells are recycled. Smelting and refinery tailings, and smelter slags are another potential secondary source.

References

Eilu, P., Bjerkgård, T., Franzson, H., Gautneb, H., Häkkinen, T., Jonsson, E., Keiding, J.K., Pokki, J., Raaness, A., Reginiussen, H., Róbertsdóttir, B.G., Rosa, D., Sadeghi, M., Sandstad, J.S., Stendal, H., Þórhallsson, E.R. & Törmänen T. 2021. The Nordic supply potential of critical metals and minerals for a Green Energy Transition. Nordic Innovation Report. 93 p. https://norden.diva-portal.org/smash/get/diva2:1593571/FULLTEXT02

Goldfarb, R.J., Hofstra, A.H. & Simmons, S.F. 2017. Critical Elements in Carlin, Epithermal, and Orogenic Gold Deposits. Reviews in Economic Geology 18, 217–244.

Jonsson, E., Högdahl, K., Majka, J. & Lindeberg, T. 2013. Roquesite and associated indium-bearing sulfides from a Palaeoproterozoic carbonate-hosted mineralization: Lindbom´s Prospect, Bergslagen, Sweden. Canadian Mineralogist 51, 629-641.

Latunussa, C.E.L., Georgitzikis, K., Torres de Matos, C., Grohol, M., Eynard, U., Wittmer, D., Mancini, L., Unguru, M., Pavel, C., Carrara, S., Mathieux, F., Pennington, D. & Blengini, G.A. 2020. European Commission, Study on the EU's list of Critical Raw Materials, Factsheets on Critical Raw Materials. 819 p. https://rmis.jrc.ec.europa.eu/uploads/CRM_2020_Factsheets_critical_Final.pdf; doi: 10.2873/92480

Monecke, T., Petersen, S., Hannington, M.D., Grant, H. & Samson, I.M. 2017. The Minor Element Endowment of Modern Sea-Floor Massive Sulfides and Comparison with Deposits Hosted in Ancient Volcanic Successions. Reviews in Economic Geology 18, 245–306.

Mudd, G.M., Jowitt, S.M. & Werner, T.T. 2017. The world's by-product and critical metal resources part I: Uncertainties, current reporting practices, implications and grounds for optimism. Ore Geology Reviews 86, 924–938.

Stensgaard, B.M., Stendal, H. Kalvig, P. & Hanghøj K. 2016. MiMa rapport 2016/3. https://doi.org/10.22008/gpub/32046

USGS 2022. Mineral commodity summaries 2022. U.S. Geological Survey. 202 p. https://doi.org/10.3133/mcs2022

USGS 2023. Mineral commodity summaries 2023. U.S. Geological Survey. 210 p. pubs.usgs.gov/periodicals/mcs2023

Werner, T.T., Mudd, G.M. & Jowitt, S.M. 2015. Indium: key issues in assessing mineral resources and long-term supply from recycling. Appl. Earth Sci. (Trans. Inst. Min. Metall. B) 124, 213–226.

Werner, T.T., Mudd, G.M. & Jowitt, S.M. 2017. The world's by-product and critical metal resources part III: A global assessment of indium. Ore Geology Reviews 86, 939–956.