UNITED RESEARCH FORUM
(CONNECT WITH RESEARCH WORLD)

4th International Congress on Earth and Geological Sciences

July 21-22, 2025 | Paris, France

Maria Holuszko

University of British Columbia, Vancouver, Canada

Urban mining for the recovery of critical metals from e-waste

With the expansion of renewable energy, development of the digital economies and electrification of industries, global demand for critical metals and minerals grows expotentially. As a result, often questtions are being asked how and from where the projected minerals demands will be met. The most likely, increased mining will be needed to supply growing metals demands, but this will face a significant environmental challenges. At the same time, electronic waste is one of the the fastest growing form of garbage on the planet, with over 60 milion tonnes of waste generated in 2022 (GEM, 2024) and this stream consists of a wide range of electronic products at the end of their life, including small electronics such as cellphones. These small electronics are manufactured using an array of specialty metals including Cu, Au, and REE. Therefore, e-waste is highly enriched in critical metals, with concentrations that exceed many times that of metal content of rocks from which they were intially extracted. For example, Au is usually extracted from geological deposit that contain 5-10g/t of Au, on the other hand a tonne of printed circuit boards (PCB) contains 300g/t of this precious metal. In addition, the smartphones are known to conatin more than 60 different metals, some precious, while others considered highly critical or even strategic. For this reason, recycling of e-waste could turn millions of waste into billions of monetary wealth, while addressing future critical metals supply gap. This presentation will take a deep dive into addressing the opportunites and challenges in recovering of critical metals from urban mines around the towns and cities.

Keywords: urban mine, critical minerals, e-waste, circular economy

Biography

Dr. Maria Holuszko, Mineral Process Engineer, Mining Engineering, University of British Columbia (UBC), Vancouver, Canada. She has more than 30 years of experience working with the governments, industry and academia. She is a co-funder of Urban Mining Innovation Center at UBC, carrying out research on recovery of value from waste, with the focus on the industrial waste and e-waste specifically. Her research focuses on the waste characterization and evaluation of primary and secondary resources for recovery of critical minerals. She is co-chair on the UNESCO chair in Green and Sustainable Electronics in collaboration with Prof. Santato from Polytechnic Montreal.

ISBN: 978-1-917892-13-1

doi.org/10.51219/URForum.2025.Maria-Holuszko