



**Cover image:** Pictured is liquid nickel emerging from a smelter in Sudbury, Ontario. Thomas Graedel and Jing Cao examined industrial life cycles and use of seven metals, or “materials metabolism,” and found that, in some of the more-developed countries, per capita metal use is 10 times the global average. Based on gross domestic product, the authors estimate that the demand for industrial metals in 2050 could be 5–10 times today’s level. See the article by Graedel and Cao on pages 20905–20910. Image courtesy of Xstrata Nickel.

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