

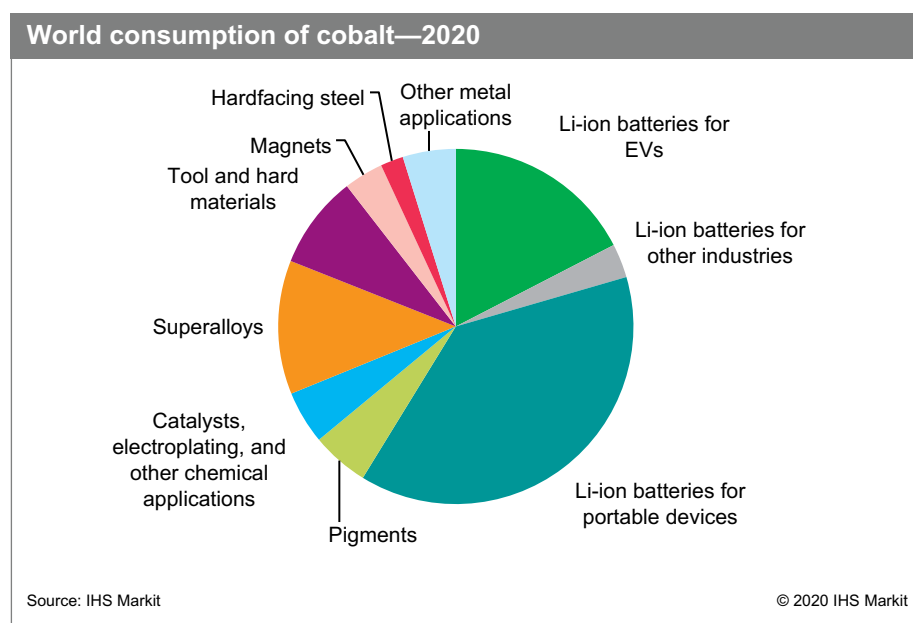
Cobalt, Cobalt Minerals, and Cobalt Chemicals

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Abstract

The market for cobalt and cobalt compounds has attracted attention in recent years. Cobalt's importance as a critical raw material in rechargeable lithium-ion batteries (LIBs) will result in a dramatic increase in demand over the next decade, as battery production has become the largest single end use for cobalt. For battery producers and end users in the automotive industry, and other industries that depend on lithium-ion batteries, questions arise around the availability and cost of this critical raw material, as well as the sustainability of cobalt supply, especially for raw material sourced from the Democratic Republic of Congo (DRC). This supply concentration of a critical part of cobalt raw material obviously poses a risk to the robustness of the entire supply chain. A second risk arises from the concentration of the subsequent steps—from concentration of raw materials to cathode, cell, and battery manufacturing—in Asia, and in mainland China, in particular. Only a minor amount is sourced from primary cobalt mines, and therefore, the cobalt market is strongly dependent on the copper and nickel markets.

The following chart presents consumption of cobalt and cobalt compounds by end use:



The increasing importance of the battery sector within the cobalt market has already altered the market and is expected to have a significant impact over the next years. There will be a continued shift from the main cobalt market demand being driven by industry and its use in superalloys and alloys towards a market that is dominated by the Li-ion battery industry and producers of its components, as well as the dynamics of the various battery end-use markets, and the transportation segment in particular.

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