

## Declining Pool of Copper Projects

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***A research report published this week identifies a significant shortfall in major copper discoveries, and describes the mining industry as unsuccessful in its exploration efforts for the red metal.***

The mining industry has been "mostly unsuccessful" in locating major new copper discoveries over the past decade. This is the main conclusion of a report published this week by S&P Global Market Intelligence (SPGMI). The report's author, Kevin Murphy, notes that this failure has been despite "historically significant investments in copper exploration".

The discoveries dataset in SPGMI's Reserve Replacement Report (RRR) for copper includes all deposits containing over 500,000 t of copper in reserves, resources and past production. The RRR concludes that over the past 10 years, US\$25.8 billion has been allocated to all stages of copper exploration, which is well above the US\$15.4 billion allocated from 1990 to 2008. However, Mr Murphy notes that this increased funding has "so far failed to identify more new discoveries, with only 102.4 Mt of copper defined in 21 discoveries over the past 10 years, compared with 992.5 Mt in 199 discoveries in the preceding 19 years".

In terms of return in copper discovered for exploration dollars spent, the 1990s were a considerably more successful decade than the 2000s. Indeed, of the 220 major discoveries in the past 29 years, 107 were made in the 1990s, and they contain over half of the discovered copper.

Mr Murphy comments that the copper discoveries in the early 2000s were also quite impressive, despite the depressed metal prices and reduced copper exploration budgets that characterised 2000 to 2003. These years benefited, however, from the discovery of a few massive deposits, notably Oyu Tolgoi's Hugo Dummett in 2001 and Collahuasi's Rosario Oeste in 2002.

The report concludes that while the amount of copper discovered annually varied widely from year to year, through 2009 it roughly followed the trend of annual spending on copper exploration. The decline in copper prices and exploration budgets that marked 2013 through 2016 had only a minor impact on new copper discoveries, which were already at record-low levels.

Although SPGMI believes the sharp decline reflects a lack of new significant deposits being found, a portion of the shortfall is attributable to the fact that additional exploration may still be required to expand the known endowment of recently found deposits above SPGMI's 'major discovery' threshold.

To account for this shortfall, SPGMI forecasts the potential amount of copper in discoveries that could be expected to meet its criteria in the future (based on historic patterns of exploration, discovery rates and success). Nevertheless, the total projected copper in discoveries from the past decade remains far below the amounts discovered prior to the financial crisis of 2008.

Mr Murphy argues that a factor contributing to the lack of major discoveries is a key shift in focus within the exploration sector. Since the 1990s, he says, the industry has almost halved its share of copper budgets devoted to grassroots exploration. The juniors, which have historically been considered the grassroots exploration specialists, have increasingly focused on expanding known deposits, while producers have progressively concentrated on exploration at their existing operations.

Although some new major discoveries have been found at late-stage projects and existing mining camps, Mr Murphy argues that "the probability of finding major new discoveries at such projects is lower than at riskier, early-stage prospects".

## Copper Targets

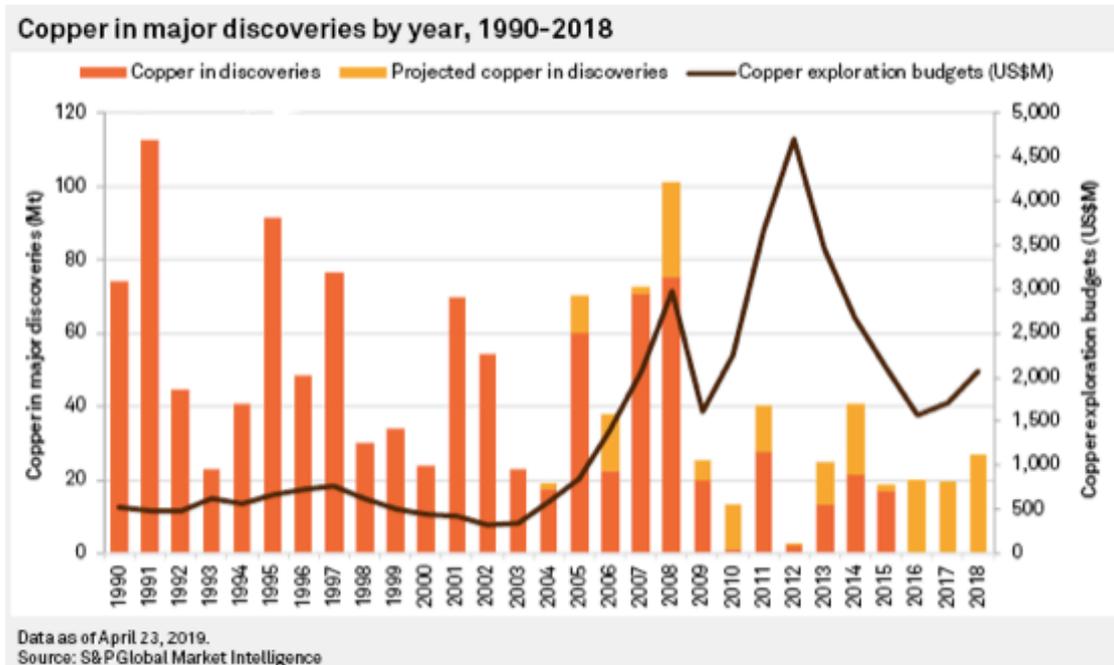
Hosting many of the world's largest copper mines and accounting for 42% of global copper production in 2018, Latin America is unsurprisingly the primary location for copper exploration, attracting over one-third of copper budgets over the past two decades.

RRR notes that this significant effort has resulted in more than half of the world's discovered copper being found in Latin America. Chile and Peru alone account for 80% of the 615.8 Mt discovered in Latin America, and 45% of the global total found since 1990.

At the other end of the spectrum, discovery rates in Canada continue to lag behind other producing nations. Canada has generated only 14.4 Mt of copper in 10 discoveries, none of which were in the past decade. Although the US has been historically successful, with 89.3 Mt of copper in seven discoveries over the 29-year period, there have been no major copper discoveries in the past decade.

While major discoveries are clearly declining, SPGMI does not expect it to have an immediate impact on the near-term pipeline. There is, the report notes, "a significant number of developing copper assets that can feed the short-to-medium-term supply pipeline, although many of these require additional investment to bring them to fruition". Mr Murphy believes, however, that "the longer-term pipeline is at risk from the reduced discovery rates".

SPGMI's research suggests that a major copper asset takes about 20 years to advance from discovery to production. This implies that the reduced discovery rates of the past decade will limit the pool of projects that could come online in 15 to 20 years, when many major copper mines are currently scheduled to be producing much less, and a host of smaller producers will have closed.



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Previously editorial director of Mining Journal, and more recently head of S&P Global Market Intelligence's metals and mining team, Chris is now Mining Beacon's editor-in-chief and lead commentator. He posts two blogs every week, one on Monday reviewing market conditions over the prior week, and a second on Thursday looking at issues on the global mining scene. There is also a quarterly blog on business opportunities in the sector.