# facing facts

*By Dante Aranda, Senior Analyst, Mine Economics, Thomson Reuters, GFMS*

In light of surging silver prices and the consequent increase in margins, GFMS has sought to present silver producers' costs in a way that facilitates a clearer relationship between costs and margins than using by-product credit methodology. This has involved a reinterpretation of the data to present costs also on a co-product basis, including capital expenditure (capex). While cash costs net of by-product credits is a useful metric, it is vulnerable to swings in the pricing of silver's by-product metals, which can distort the picture.

### Using By-Product Methodology

Silver Total Cash Costs (TCC) net of by-product credits fell year-on-year from -$3.75/oz to -$4.12/oz led by higher production and by-product credits from Peru. The drop was partially offset by lower base metal production from KGHM Polska Miedź and Hindustan Zinc, shifting two of the world's lowest cost producers further up the cost curve. Over 2016, both operations averaged a TCC net of by-product credits of -$32.42/oz, a sharp contrast against -$42.17/oz in 2015.

If we exclude silver production from India and Poland, TCC net of by-product credits costs continued trending lower in 2016, averaging $1.45/oz, or 59% below the same period last year. This was driven by most countries including Peru, Argentina, Australia, the United States, Russia and Mexico, where higher grades, lower fuel costs and direct mining costs expressed in US dollars led to lower costs globally. Amongst the countries in the aforementioned group, Peru posted the largest drop in TCC net of by-product credits, falling from $4.57/oz to -$3.76/oz due to higher silver and copper production at Uchucchacua and El Brocal respectively.

As metal prices remained subdued over 2016, a common theme around costs savings took shape in Peru. Lower contractor and supplier costs, coupled with falling freight costs and technical services paved the way for miners to secure lower fixed costs. The demands of local communities became more lax and, with businesses looking to rent their equipment at any price, significant savings materialised. The significant drop in cash costs followed the remarkable surge in Peruvian silver and copper production at the country level, up 7% and 38% in 2016.

Turning to the world's largest silver producer, cash costs in Mexico dropped by $0.38/oz to $1.48/oz on the back of higher by-product credits at Dolores and higher grades at Palmarejo, partially offset by lower silver production.

### Using Co-Product Methodology

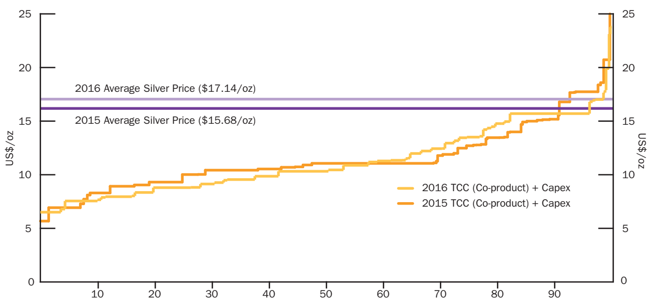
On a co-product accounting basis, TCC+capex in 2016 at the global level stood at $11.38/oz, up 5% from last year. The main driving force was a 13%, or 122 Moz, drop in silver equivalent ounces, partially offset by a 6% contraction in capital expenditure to $2 billion. KGHM Polska Miedź accounted for nearly 50% of the drop in silver equivalent ounces, while Mexico saw the largest contraction in capex, followed by the United States and Argentina. Under this cost measure, we note a change in trend following three years of downside pressure on costs.

However, if we exclude silver production from India and Poland, the falling trend comfortably extended into 2016, with costs dropping by 2% to $11.22/oz. Under this smaller sample size, capex dropped by 10% year-on-year, partially offset by a less pronounced drop in silver equivalent ounces, mostly explained by Penasquito. Contrary to this downward trend, costs at the second-largest silver-producing mine in Mexico jumped by 42% to $15.70/oz due to a 46% drop in gold production as a result of lower ore grades (-30%) and throughput (-16%). In addition, capex climbed 16% to $235mn as Penasquito's Pyrite Leach Project (PLP) gained company approval in July 2016. Goldcorp forecasts that the PLP will add approximately 5 Moz per year commencing in 2019 by increasing overall silver recoveries stemming from the treatment of zinc tailings.

A pronounced weakening of most 'producer currencies' versus the US dollar since 2014 has offered substantial cost benefit. Year-on-year, the Mexican peso, Peruvian sol, Australian dollar and Argentine peso were respectively 59%, 6%, 1% and 59% weaker. By the co-product TCC+capex measure, excluding Poland and India, 5% of the silver industry was 'underwater' against the 2016 average silver price of $17.15/oz, a 7% drop relative to 2015.

Although US-based primary silver mines did not have the same advantage of currency devaluation, as a group, they succeeded in cutting costs by 22% to $11.47/oz largely thanks to higher production and lower capex. This was particularly the case at Lucky Friday, where production rose by 0.6 Moz, while capex fell by 26%, or $14mn as the #4 Shaft, a key growth project, neared completion.

**Silver Mining Costs**




Source: GFMS, Thomson Reuters

Turning to costs, lower diesel prices and higher grades led to a $3.71/oz drop in costs on a TCC+capex co-product basis to $17.01/oz.

We expect global by-product costs to continue trending lower over 2017 as credits from gold and base metal operations materialise, albeit at a slower rate as grades and oil prices begin to exert upward pressure on direct mining costs. However, we believe silver costs on a co-product accounting basis will edge higher, with cost of sales and capex following in the footsteps of the silver price.

**Dante Aranda, Senior Analyst, Thomson Reuters, GFMS** Dante began his career in the commodities market in 2010 when he joined Thomson Reuters in Toronto as a commodities specialist, working with a broad range of natural resources companies. Now based in London as a precious and base metals mining analyst, he is heavily involved in the team's modelling of mine production and industry costs using Matlab and VBA and is also a leading contributor to the GFMS team's technical analysis. Prior to Thomson Reuters, he worked at Banco de Credito del Peru as a Junior Trader on the FX structured products desk. He holds a BSc (Honours) in Financial Economics & Applied Statistics from the University of Toronto, and is a CFA Level III Candidate.