

Methodology: Production costs data set

1 Introduction

1.1 What is this data set?

This data set provides an overview of global gold mine production costs. We report gold mine production costs on a quarterly basis since 2012, as well as providing an industry cost curve for the latest available quarter.

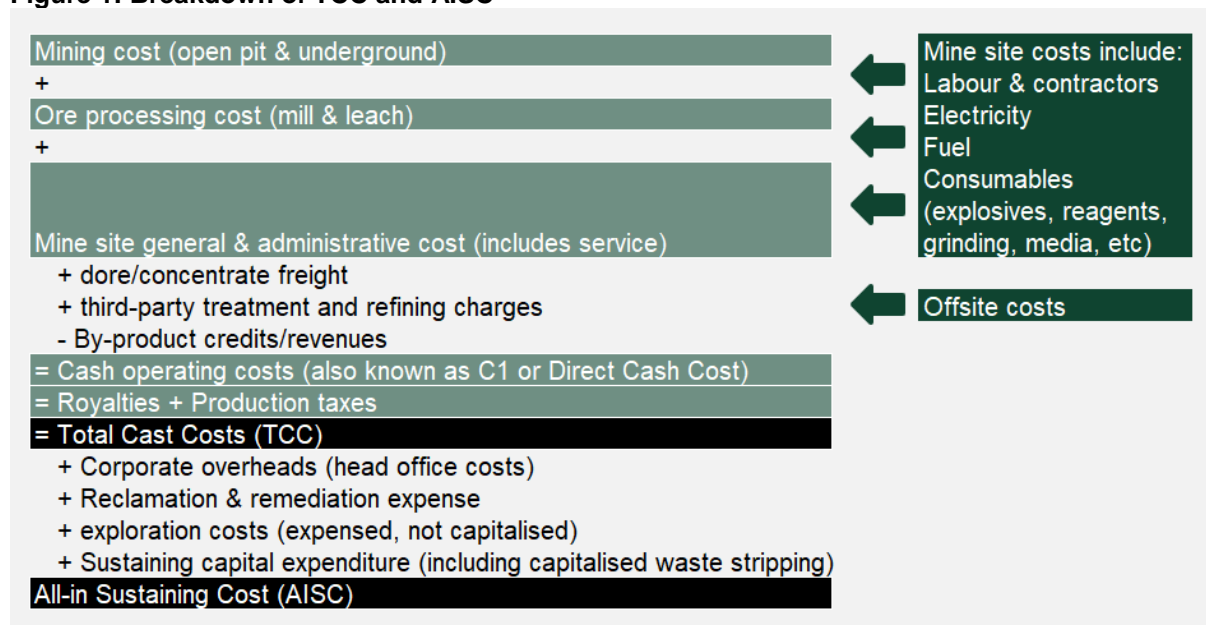
1.2 Why is this data important?

The gold mining industry reports production costs using a range of metrics. Reporting practices vary significantly from company to company, despite numerous periodic efforts to standardise industry cost reporting. Standardised metrics provide greater transparency into the costs associated with gold production, and can be helpful to investors, governments, local communities and other stakeholders in understanding the economics of gold mining.

Production costs are commonly provided as two headline metrics: **Total Cash Cost (TCC)** and **All-in Sustaining Cost (AISC)**.

All-in Sustaining Cost (AISC) includes cost items additional to TCC¹, with the aim of better-reflecting the full cost of keeping the mine in business. AISC therefore includes: exploration costs expensed by the mine owner; sustaining ("maintenance", or "ongoing") capital costs; an allocation for corporate overhead charges not otherwise accounted for at the mine site level; plus reclamation and remediation expenses or accruals. In general, the largest components of AISC (aside from the components of TCC) are corporate overheads (i.e. head office costs) and sustaining capital costs.

Figure 1: Breakdown of TCC and AISC



¹ Total Cash Cost (TCC) is a metric which includes all costs incurred at the mine site, such as open pit and underground mining, ore processing, (crushing, grinding, leaching etc) and onsite general & administrative costs incurred in producing an intermediate gold-bearing product such as a doré or sulphide concentrate. TCC also includes certain offsite costs; the costs of transporting the intermediate product from the mine site to a smelter or refinery and the costs of further downstream processing to produce refined gold. Simplistically, Total Cash Costs are equivalent to Gross Revenues less EBITDA (after adjustments such as inventory movements, provisional pricing and writedowns).

AISC does not include finance costs or interest charges which are typically incurred when finance is raised to build or expand a mine. AISC also excludes other items that might be material to the cash flow generation of a mine (or company) such as corporation tax and capital costs for initial mine construction or expansion.

2 Process

2.1 Where is data sourced?

Our core mine production costs data are provided by Metals Focus, a leading independent precious metals consultancy. Metals Focus meets our strict criteria for the provision of data, which includes the need for an extensive global network, an experienced team, and a robust methodology.

2.2 What frequency of data is available?

We update and publish this data set every quarter, although with a significant lag due to company reporting schedules

2.3 How is the data compiled?

There is no regulatory requirement for mining companies to adhere to any standard in reporting unit production costs. Some companies adhere to the methodology developed by the World Gold Council while others report costs largely based on this standard but deviate from it in certain regards.² For example, some companies reporting AISC may only include a small provision for corporate overhead charges in their calculation while others will prorate 100% of the charges across their operations. Metals Focus attempts to normalise these cost discrepancies through thorough examination of reported financial statements.

The data underlying these metrics is presented on a consistent basis, to ensure that like-for-like comparisons of production costs from mine to mine can be made. Considerable effort goes into ensuring that cost metrics account for underlying inputs, such as labour, energy, reagents and consumables, in a consistent manner.

2.4 How are revisions to data handled?

Revisions to statistics are common place and are to be welcomed as a sign of improved market intelligence. Many macroeconomic indicators, such as gross domestic product estimates, are revised. Gold statistics are no different. The first estimate of the supply and demand data will capture a certain amount of information. But over time new information may come to light, which will be incorporated into the data. The World Gold Council is committed to publishing the most accurate, up-to-date gold demand and supply data available. We are transparent with revisions to our data series, which will be updated to reflect any new information that emerges or new measurement methods that are introduced.

2.5 How is the data checked or verified?

Before it is published, the data is rigorously checked and reviewed to ensure that any errors are caught, and users can have confidence in it.

Given the opacity and complexity of the gold market, industry-level cost statistics are best thought of as a guide. Production cost data from publicly-listed mining companies are very accurate, but when aggregated to represent the industry as a whole, granularity is lost. For example, some mines may have costs above or below the industry average. The data collection framework and process are designed to ensure that each estimate is as accurate as possible based on the information available at that point in time.

² [World Gold Council Guidance Note on Non-GAAP Metrics - All-In Sustaining Costs and All-In Costs](#)

3 Timings

3.1 When is the data set released/published?

Production cost data is collected and reported quarterly, in conjunction with the publication of Metals Focus' Gold Mine Cost Service. Owing to the different reporting schedules between gold producers, this data is reported with a three-month lag.

4 Notes

4.1 Industry Cost Curves

Cost curves are a visual representation of an industry's cost structure. The X-axis shows cumulative quantity of production, with cost per ounce of production (in this case TCC or AISC) on the Y-axis. Mines or companies are ranked from lowest to highest cost, from left to right (i.e. the highest cost producers are positioned on the right-hand side of the curve).

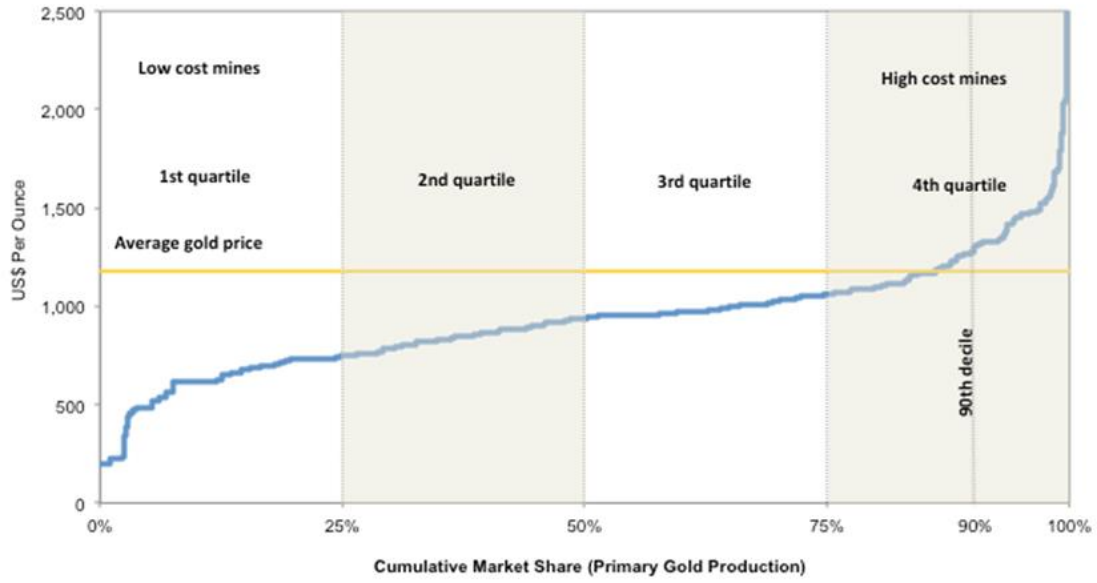
A cost curve provides a visual snapshot of the industry at a point in time and can be used to assess the relative cost competitiveness of each of the constituents of the curve. It can also provide a basic overview of the profitability of the industry, relative to a given gold price. The curves presented here are populated by primary gold mines – they generally exclude gold mined from co- or by-product mining operations where the primary metal mined (main source of revenue) is not gold (e.g. copper).

This can help determine which mines might be vulnerable should prices fall further, enabling the estimation of the production volume which could be lost to mine closures. However, this does not consider other factors such as the duration of low prices, or company balance sheet strength that could support a loss-making operation for a considerable time. Mining companies are generally reluctant to close loss-making mines in the short term, as the process of mine closure (and re-opening if prices improve) is costly.

Similarly, recently-commissioned mines in the process of ramping up production may also have anomalously high costs in their early years and therefore their position on the cost curve may not accurately reflect their longer-term viability. Another issue to bear in mind is that a significant proportion of global gold supply is from small operations and artisanal miners, for whom operating cost data is unavailable.

The cost curve is often discussed in with reference to cost quartiles, which are conveniently defined by vertical lines splitting the curve into four equally-sized blocks. The first or lowest (left-most) quartile comprises those mines which are the lowest 25% of the population (lowest cost mines); conversely the top (right-most) quartile comprises the highest cost mines. Understandably, mining companies often attach significant value to mines positioned in the lowest quartile.

Quartile and decile, are terms typically used to define positions on the cumulative production/cost curve, as follows:



Source: Metals Focus