

Teach yourself how to build a Business Case for any industry

esp mining



2h: Level 2 evaluations in the mining/resources industries



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A perplexing, bad method of valuing ore deposits ...

Some people try to value resource businesses/ projects by the amount of metal in the ground: -

1. Gold projects, for example, can be 'valued' by how many ounces are in the ground in Reserves or Resources. They use recent transactions in the gold industry to infer that gold in the ground has been valued at between US\$xx per ounce and US\$yy per ounce. The business/ project under consideration is related to similar ones across this range and given \$kk per ounce * ounces in Reserves = US\$ XXX million.
2. The same can be done for copper, zinc, lead, diamonds, coal, iron ore, ... etc
3. I have extreme reservations about this method and cannot recall ever using it. It is so broad brush in its understanding of the business/project as to be very unreliable.
4. The 'similar" businesses/ projects might at first seem reasonable, but what about the cumulative impact of all the subtle differences in production rate, rock hardness, slope angles, waste ratio, head grade, minor elements, contaminant chemistry, recoveries, operating costs and private royalties? In Queensland lies one of the world's biggest undeveloped copper deposits – by the above method it is worth US\$ hundreds of millions. But its NPV is negative and its market value is tiny.
Whenever you read some metal's resource is the largest undeveloped deposit in the world be wary – there is some major reason as to why
5. I know a CEO who used this method to bamboozle his Board and gullible shareholders.

It is perplexing how popular this valuation method has become.

How much ore resource is needed for evaluation?

Many mining companies have imposed strict rules on the quantity and quality of ore that is needed to underpin an evaluation.

These usually refer to the “JORC” code or its equivalent in other countries.

*For example: ‘Concept Studies must be supported by ore in the ‘Inferred’ or higher category, or
‘A feasibility study must have sufficient ore in the ‘Measured’ category to support 80% of the payback period.’*

If you are new to the mining sector of a business you must become familiar with your ore resource code and its terminology: Reserve, Resource, Measured, Indicated, Inferred, mineralised material, etc, etc. You need to become friends with a few mining engineers to learn how mine planning is done and concepts like mining inventory, material moved, bcm, specific gravity, Whittle Pits, etc, etc.

Often these company requirements have been brought by bad experiences in previous projects where operations received less tonnes and lower grade feed and where ore ran out prematurely or perhaps where an ambitious project team/leader overstated a resource to get their monetary bonus when the project was commissioned.

How much ore resource is needed for evaluation? - continued

I have worked in various companies and now believe: -

1. Strong discipline is needed because there have been so many poor evaluations and shonky projects where people were incompetent or dishonest.
2. The ore resource estimates need to be properly audited by independent experts
3. None-the-less, decision makers should have 'eyes-wide-open' and understand the project under a range of ore resource quantities and qualities
4. These specifications of ore resources are useful and should form the basis of some of the valuation cases.
 - a) Having enough ore to achieve payback is one important case
 - b) An essential case is where experts know what is in each category of ore, have assessed the exploration potential of the project and then make an expert judgement of how much ore is likely to be mined by the time the project comes to its end.
 - c) Evaluate low, mid and high estimates of final mining inventories.
5. Limiting an evaluation to measured, indicated and inferred categories of ore is dangerous. It limits value to what happens to be drilled out and known today. It may be grossly understating the business.
6. I would put a lot of importance on the experts' final mining inventory case.

Metal and commodity prices needed to ride out the next market trough ...

I am a great believer in understanding what combination of future market conditions is needed to make the business/project break even: -

If we acquire the business/project what price & forex rate is required for it to achieve at least zero net cash flow on a year by year basis

What price & forex rate is required to achieve zero NPV?

How do these two prices/forex compare with the graph of prices/forex in real terms for the past 30 years?

How deep and long were the troughs in the market in the past? Use Real terms and you might find the result a bit worrying!

Are you being brave or conservative?

It is pretty important for your new business/project to be able to ride out market downturns no matter how deep and long they are likely to be.

If the business/project has good margins and can ride out troughs its NPV will be relatively high anyway. Perhaps it deserves a higher bid.

If it is running close to breakeven then its NPV will be relatively low anyway. Should you bid? Will it survive downturns? Can you introduce major cost savings or price increases that present owners can not?

Schoolyard Bullies...

Perhaps one of your biggest problems in the resources industry will be study leaders, managers or experts who have a personal stake in the evaluation.

If your work is suggesting that the project/mine is looking dubious, they may fiddle with capex and opex estimates. They may use their personal authority to pressure for a reduction in the estimate by scoffing the design is 'over-engineered', 'Rolls Royce', 'gold plated'. Favourites are to attack the indirects, such as contingency, talk about buying second hand equipment or search for new process routes. Another trick is to try to eliminate the costs of closure, which can be enormous in the resources industry, by (wrongly) asserting that salvage will cover the expenses.

You must resist this pressure and establish relationships so the truth gets through.

Key Drivers in mining...

In mining assessments, drivers of course need to be assessed systematically. Work through each of the four cash streams changing the more important parameters one by one or in inter-related groups. Vary them by the amount that your colleagues estimate is likely for each.

For example in the Revenue Cash Stream, it may be decided that recovery of metals in processing may be as follows:-

recoveries	min	low	mid	high	max
Copper	83%	86%	89%	90%	92%
Gold	45%	54%	58%	60%	65%
Silver	20%	28%	33%	36%	40%

Discuss with the processing experts if each of these three metals will behave independently or if they will tend to be in the same clusters of 'min', 'low', 'mid'

Price and foreign exchange rate may need to be paired – as price of commodities increase in US\$ terms, then so may the A\$ and the C\$.

The upper part of a key drivers chart may have the following structure ... but with numeric results added

	1. Revenue	sales	throughput	
			head grade	
			recovery	
		price	US\$ price	
NPV			Forex	
	2. Opex	mining	waste	volume
				unit cost
			ore	volume
				unit cost
			tech services	manning
				salary
		processing		



End of Module