Rock, Paper, Scissors – Lithium Kills Lead Dead

In recent weeks I was summoned to give a briefing to one of the largest companies in Germany on their Futurology project as it relates to mining over the next 15 years. I was almost confounded when they asked me which metal we will not need to mine at the end of the designated period. After a brief reflection the answer seemed obvious and that metal was Lead. Even they were taken a bit aback as Lead has been part of human endeavour and industry since the earliest days of human civilization.

The logic though is that Lead is a metal with a strong (or indeed the strongest) component of recycling in the metals space. This implies that the existing stock of Lead, which is primarily "stored" in the world's stock of Lead-acid batteries is infinitely recyclable. Very few batteries escape the recyclers tender mercies after a vehicle has gone to the Great Beyond. This implies that most Lead mined now goes to meeting incremental demand for automobile batteries.

This begs the question of what happens to Lead mining when the amount of Lead recycled equals the amount of Lead required for traditional applications if the usage in Lead batteries starts to go into reverse? The rise of the Lithium-ion battery and the electric vehicle seems destined to hasten that day.

Lithium – Out with the Old

The macro trend that is ringing the death knell for Lead's once mighty position is the rise of Lithium and moreover the potential of the surge in electrical vehicle penetration to make some countries "combustion engine free zones" by 2030. This is not a pretty scenario for Lead. As cars are getting

lighter one of the heaviest components (the lead battery) is also the most retro in its contribution to moving people forward.

Even the industry thinktank, the International Lead Zinc Study Group (ILZSG) has grasped the extent of Lead's dilemma: Their latest projections cite the dangers for Lead demand as:

- Lead-acid already losing market share to lithium-ion in some stationary battery sectors
- Pressure from auto-makers to develop more efficient and robust batteries
- Main challenges for lead-acid are Dynamic Charge Acceptance (DCA) and shallow cycle life
- Competition with lithium-ion in auto-batteries intensifying as costs come down (eg. Tesla)

The rise of China and the desire of its middle class for automobiles was a phenomenon which gave Lead demand its one last boost over the last decade. Even at the lower levels in China though we see Lead starting to go into eclipse. In the chart below we can see how in electric bicycles, used by the lower echelons of the Chinese economic pyramid are expected to decline in absolute terms and the share held by Lead-acid batteries to face growing replacement by Lithium-ion batteries.

This chart humble as it is shows the most disturbing trend. If one looks at 2019 consumption of Lead for this product it is back at 2010 levels. This might imply that the scrapping of ten year old bicycles will, by the end of this decade, provide all the Lead needed for new bicycles using Lead acid batteries. Here we see in microcosm that Lead will be a zero-sum game with a "closed-cycle" of Lead recycling ultimately serving most, if not all, "new" demand for Lead.

If countries move *en masse* to adoption of EVs over combustion

engines (as we should expect in China by 2030) then not only will most demand for Lead batteries be removed but there will be a massive flowback of Lead from existing vehicles being scrapped. This will remove all incremental demand for Lead and provide “surplus” Lead for which we cannot foresee any new application.

The Zinc Conundrum

The demise of Lead that we posit here has an interesting implication for Zinc mining. As is well-known I am an unreconstructed bull of Zinc. Traditionally Lead and Zinc and Silver have appeared in the same mines (to varying degrees) and have either pulled together or pulled against each other in the economic equations that make those mines viable. That begs the question of what should happen to the economics of existing or planned mines should Lead become something akin to a zero in the algebraic calculation of the economics of a mine. Moreover if the Lead cannot be sold then what does one do with it?

The table below shows the perilously poised nature of the Lead market.

However, since those April projections, supply has exceeded demand by 48,000 tons on the global lead market from January to August, according to more recent statistics from the ILZSG.

As we all know there have been reductions in the output of Zinc/Lead mines due to mines closing or being mothballed. This has propelled the Zinc price substantially higher but left Lead, not unjustifiably, wallowing.

Thus if even mine closures can’t help Lead then what can? One thought that crossed the mind was that if Lead’s price

declined enough then recycling may lose its viability (despite government demands that Lead batteries be recycled rather than go to landfill etc).

The rosy lining to Lead's demise is that Zinc mines will need to be justified by an even higher price than the currently projected sweet-spot of $1.20 per lb or above because Lead will not be contributing much or anything to the equation. This implies an even bigger boost to Zinc and a hunt for the type of mineralogy in deposits that are high-grade in Zinc (and silver) and relatively lower grade in Lead. A hunt for a unicorn maybe?

Conclusion

If this was the film Gladiator then Lithium would be played by Russell Crowe and Lead would be some aged actor destined to be crunched on the head with a spiky ball and dragged from the arena to be fed to the beasts awaiting below. This will not be the first time that a mineral or an alloy thereof has gone out of fashion. Bronze is not what it was and pewter is scarcely employed these days. Thorium once had widespread usage in gas mantles to the extent there was even a cartel that dominated its trade.

Lead though is one of the 800lb gorillas of the base metal space and its demise (or substantial sidelining) will make waves because of its intimate connection with the Zinc and Silver mining business. Lithium comes out with the laurels from this David & Goliath slugfest. Like all new champs though, it needs to watch its back for new contenders arising as the airwaves are thick now with talk of Manganese, Antimony and all sorts of other exotic combinations that will continue to make the battery space a veritable ferment of new technologies.

The Zinc Putsch is On

There was a curious juxtaposition this week that we noted on the kitcometals.com price page. While a story thundered that the World Bank was trimming global growth projections the reality of prices was very different with all base metals up for the day and Zinc up a stunning 2.5% to 93 cents, the highest level in years. It was only a couple of weeks ago crossing the 80 cts threshold and it is now a long way from the 67 cts at which it bottomed in the second half of last year.

It seems but a distant memory, but last October the obituaries were being written for Glencore, the world's largest Zinc trader with over 60% of global traded volumes. Now those fears are well in the past and Glencore, like Zinc, has arisen from its grave.

At this point in time we are looking at a nearly 50% uplift in the price in a period of a mere nine months. There is no other major metal, precious or base, that has managed such a rise in such a short amount of time in recent memory. If anything the pace has picked up in recent times. The rises are starting to look almost symmetrical with the diabolical fall from the middle of last year.

As the chart above shows, zinc has found resistance in previous years around the $1.10 per lb level and has then retreated. However the supply situation has never been as bad in the last ten years as it is now. Heavy underinvestment has taken its toll on the pipeline of new projects, to the effect that there aren't any to speak of. Therefore the International Lead and Zinc Study Group (the leading "thinkers" on this

topic) have projected a shrinkage in supply for 2016, just as prices have started to surge. Here is their projection.

It may not be a large decline but it’s the second negative year in a row and reflects declining production from existing mines rather than mothballing or production cuts as a response to weak prices. We are gearing up for the long awaited perfect storm in zinc, where a modicum of demand growth encounters a chasm in the production pipeline. Though maybe we should rephrase that as there is NO production pipeline to speak of. This is the major metal where least money has been spent since 2006 in new discoveries or development than any other metal. Zinc is of course linked inextricably with the fortunes of Lead, where prices have lagged and production has also been impacted by closures of mines (and repurposing of refineries). This trend is shown in the chart below:

The year to contrast with is 2008, a bad year for every metal where the opening/closing was not even vaguely as unbalanced as now with an even greater accentuation of the closures in 2015.

Then if things couldn’t get worse in 2016 we are seeing:

- Glencore has reduced zinc mine output by 500kt/yr in Australia, Kazakhstan and Peru
- Reduced output at HZL’s Rampura Agucha operation in India due to technical difficulties
- CBH Resources and Perilya to reduce production at Endeavour and Broken Hill mines in Australia
- Suspension of output at Al Masane in Saudi Arabia

This trend is feeding through to LME warehouse levels as the

chart below shows.

Statistics (always rubbery out of China) suggest that Shanghai stocks are not what they were either with a considerable shrinkage.

Conclusion

Added to this is the estimate for the trade study group of a 3.5% rise in demand in 2016, we can see a supply crunch that is motoring the price along nicely. With such a tailwind, and end users scrambling to write contracts to guarantee supply, I would expect the price to breach $1 per lb in the very near future and then head steadily towards the previously impenetrable $1.10 barrier. As they said on old maps “Beyond here there be monsters”. What will happen is that no one in the mining industry shall stir from their behinds until prices breach $1.20 and even then they would rightly (on previous bad experience) want to see them hold there before getting over-excited about launching projects. This means an ever-worsening supply situation. For existing producers this will be a deeply profitable and long overdue development. The mood will fire up the hunt for juniors that have respectable projects. Many have been on the backburner so long they have melted onto the pot…. With an investor universe largely clueless on zinc’s dynamics this will very likely degenerate into a blind rush in the direction of the best promoted offerings. Ever was it thus, but still zinc above $1.20 will be exciting territory and well worth positioning oneself for now.