[2008-12-17] Four metals seek immunity from recession - Tantalum, Zirconium, Hafnium and Rhenium

There is no metal entirely immune from recession but the ones that might hold up better than most, I would suggest, are Tantalum, Zirconium, Hafnium and Rhenium.

Each of these metals share a common thread in that they are dominated by companies who hold a significant market share of a small market, and serve industries which are capable of long term planning.

Zirconium, essential to the nuclear industry, is only significantly produced in metal form at six plants worldwide: Cezus-Areva of France, Wah Chang & Western Zirconium in USA, Glasov of Russia and two newish plants in China. But more than 50% of nuclear grade metal supply comes from the French. Hafnium, its rarer by-product, is only recovered at the rate of 1:50 to Zr and only produced in commercially useable form in France and the U.S.

Meanwhile, Rhenium relies somewhat overly on the collection of Rhenium from flue dusts at roasters in Chile, where the converter of Molybdenum Sulphide Concentrates, Molymet, is the main producer.

With regard to Tantalum, Talison Minerals of Australia was, until recently, worth more than 50% of the tantalite that lay behind last year's approximate 2,500 mt consumption of Ta metal. Cezus of France supplied 2,500 mt of the worlds 6000 mt demand for Zr metal and 35 mt of the world's 70 mt demand for Hafnium, while Molymet of Chile supplied 27 mt (60%) of the worlds 45 mt of Rhenium demand.

What do these structures tell us about the future developments in these metals and the industries that rely on them?

In the case of Tantalum, the paradox was that the predominance of Talison in their field (or rather its former owner, Sons of Gwalia) could well be described as an 'inefficiency'. For years, it meant that the Tantalum business was so dominated that new entrants saw little or no room to invest and compete.

Talison's announcement on November 26th this year of the closure of the Wodgina mine in Western Australia (30% of world Tantalite supply) had an immediate impact. Prices of end-product Tantalum for supply to super alloy makers and other industries bucked the general market trend and rose from $220 per kg to $280 per kg. But, more negatively, it also highlighted the new dependency of the market upon tantalite coming from war zones such as Western Congo and Rwanda, to make up any future deficit.

In the case of Zirconium and Hafnium, the world was (and is) reliant on an industry largely constructed in the 1950's & 1960's to meet a nuclear demand that, except in France and Russia, fell out of favour from the 1980s onwards. The industry is too large, strategic and dangerous for new entrants other than the state to take up a position. It is thought that environmentally safe construction of new plant to produce Zirconium and Hafnium from Zircon sand would require investment of more than $1 bln.

Meanwhile, the dominance of Molymet in by-product Rhenium recovery from the 1970s effectively allowed consumers to slumber under the illusion that all their prospective demand would be covered by this dominant source and thus no pluralism was encouraged.

What changed was not the supply side so much as the world we now live in – one which has seen

the greatest proliferation of applications of minor metals of all time. In the last few years the world came to realise that the metals that were once thrown away or difficult to dispose of, neutralise or on-process, were now critical to a host of new-fangled consumer or strategically important products and was potentially a profit-centre guilty of being left on the table. Further, environmental considerations now mean that a further motive for extracting minor metals was not just profit-led but an obligation upon miners and processors to advertise their green credentials to government entities.

So why should these metals now maintain price when all around is collapsing? Well, I would not want to insult the intelligence of the readers of Metals Week by suggesting that the elements I have mentioned are entirely immune from weakness, but I would make a very strong case that their decline, if any, will be measured and slight.

Part of the reason is that in the case of all these metals the world has not yet found better ways of achieving the outcomes that they alone produce. Tantalum (dependent on tantalite) is still the favoured metal for capacitors in mobile phones and other electronic products. Zirconium, being a low-neutron absorber, is the only way in which heavy water may be safely moved in nuclear plant and equipment and thus also used in fuel rods. Hafnium is the only metal that by blocking neutrons may be effectively used as ‘control rods’ to break fission. And Rhenium remains the un-substitutable element within nickel base alloy for gas turbine engines (aero and land-based).

All four elements are governed by industries whose demand is planned years and decades ahead. According to the World Nuclear Association, 30 reactors are being built around the world today, another 90 or more are planned to come on line during the next 10 years and over 200 are in the pipeline, the majority of which are being proposed by the Chinese and Indian governments.

Tantalum, used in medical implants, gas turbine alloys, electronics and corrosion resistant chemical plant & equipment is also secure in its market sectors. Finally, Rhenium remains key to the power generation industry where past history shows that the economic cycle only tends to dent rather than destroy overall trends. The GE order for $2 bln worth of gas turbines for Iraq announced this week is an example of long term strategic demand.

Either way, metal people, especially those in the minor metal field, need to be grateful that our money is tied up in something physical and as far from the madding crowd as possible. Ideally, I would suggest that metals seeking immunity from the current recession need to satisfy the niche test, perhaps with an assorted quantity of un-substitutable and long term uses.

The above items, with Nuclear Grade Zirconium metal currently trading to end users at $60 per kg, Hafnium at about $1000 per kg and Rhenium at $10,000 per kg, I would suggest, are some of the best candidates.

At the end of the day it could be worse; at least if you are in metals there is the chance that you have something that is going to be used in a product. As I keep saying, I have never seen anyone melt a derivative yet.

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