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HALLGARTEN & COMPANY

Sector Review

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Tin Review The Squeeze is On

Company	Ticker	Currency	Price	Mkt Cap	Stage	Call
				mn		
Metals X	MLX.ax	AUD	0.19	313.9	Producer	Neutral
Alphamin	AFM.v	CAD	0.40	60.4	Past Producer Reactivating	Short
Kasbah Resources	KAS.ax	AUD	0.13	51.5	Advanced Exploration	Neutral
Consolidated Tin Mines	CAD.ax	AUD	0.07	17.8	Past Producer Reactivating	Long
Stellar Resources	SRZ.ax	AUD	0.05	11.2	Exploration	Neutral
Pella Resources	n/a	GBP		n/a	Past Producer Reactivating	n/a
Equaminerals	EQH.ax	AUD	0.19	n/a	Past Producer	Neutral
Secondary Tin Holders						
UCore	UCU.v	CAD	0.28	48.3	Exploration	Long
Avalon Rare Metals	AVL.to	CAD	0.60	65.9	Past Producer	Avoid

Tin Sector Review

The Squeeze is On

- + Long term underinvestment has led to a shortage of projects in the pipeline
- + Moves by leading producers to on-shore further processing of concentrates is disrupting the marketplace, creating shortages and should lead to higher prices in the short to medium term
- + The on-shoring move will lessen China's grip on the finished metal marketplace
- + Tin only ranks 25th on the British Geological Survey's list of critical metals. However that was in 2012 and things have evolved since then.
- ✗ China is a major (but not dominant) player. Recent history has shown its tendency to play with markets for ulterior motives.
- ✗ The Indonesian action has thrown an already tight and skittish market into turmoil
- ✗ Markets and most investors have not got any sort of a grasp of tin and its dynamics which means that raising the profile of the sector will be a long and arduous task

Peak Tin?

Tin has been a very unglamorous metal for a long time. Its very name seems destined, with lead, to denote some sort of cheaper, less authentic metal. Mining the metal has a history almost as long as iron and copper, with a buzzing trade between the mines of Cornwall and the Roman Empire in its heyday. Applications such as pewter and bronze meant it was a household object for the intervening millennia. Mining of the metal is synonymous with the aforementioned Cornwall, as well as Bolivia while more recently Indonesia and Malaysia have been the go-to locations for mining the metal while Spain, Australia, Rwanda and others have been less heralded locations.

With the price in the doldrums for decades only the most economic producers survived and this tended to be the miners with deposits that could be exploited by dredging or with the comparative advantage of really cheap labour. The resurgence in the industry in recent times has been only on the price side, for production remains subdued because of long term underinvestment and a generalized disinterest amongst mining groups in the metal. Canadian mining markets have shown a particular disdain for the metal, while Australian investor have maintained a subdued but constant level of interest. The ASX interest is historic in nature as many investors made good money out of tin in its heyday while Canada has never been such a major tin player.

The landscape we shall review in this note is essentially one of declining production in Indonesia and Malaysia (and reputedly Peru), export complications in Indonesia as they grapple with maintaining value-added on this declining industry, China remains off-limits and in some way autarkic, Bolivia is similarly off-limits (at least in investors' perceptions) while a few companies are trying to revive production in Australia and investigate the possibilities in places as untried as Morocco. Interestingly Africa, most notably Rwanda, is having a tin renaissance and Brazil is on the rise (impelled forward by the Peruvian tin major, Minsur).

On Tin

Tin is a chemical element with symbol Sn (from the Latin word *stannum*) and atomic number 50. Tin shows chemical similarity to neighboring elements in the periodic table, germanium and lead. Tin is the 49th most abundant element in the Earth's crust, representing 2 ppm, compared with 75 ppm for zinc, 50 ppm for copper, and 14 ppm for lead. Tin is obtained chiefly from the mineral cassiterite, where it occurs as tin dioxide, SnO₂.

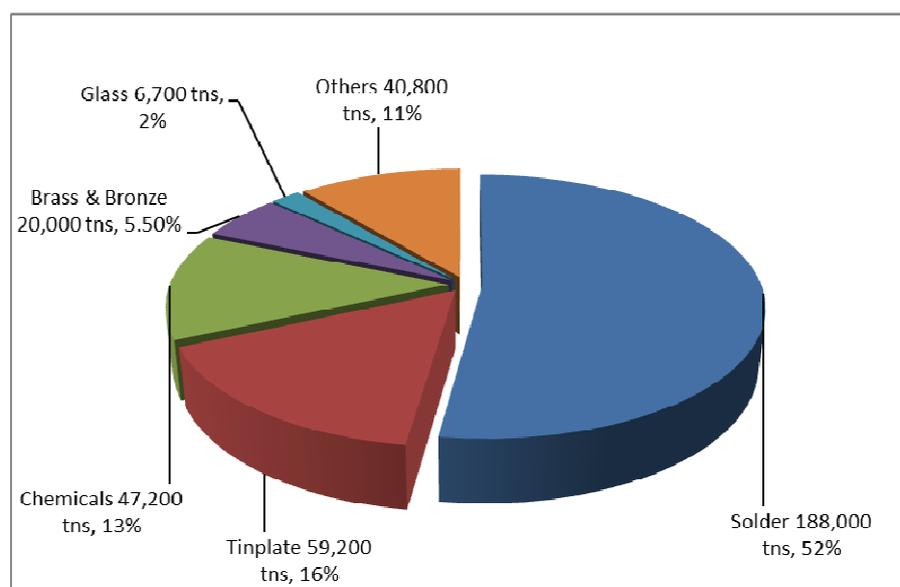
This silvery, malleable metal is not easily oxidized in air and is used to coat other metals to prevent corrosion. The first alloy, (since 3000 BC) was bronze, an alloy of tin and copper. After 600 BC pure metallic tin was produced. Pewter, which is an alloy of 85–90% tin with the remainder commonly consisting of copper, antimony and lead, was used for flatware from the Bronze Age until the 20th century.

Tin does not occur as the native element but must be extracted from various ores. Cassiterite (SnO₂) is the only commercially important source of tin, although small quantities of tin are recovered from complex sulfides such as stannite, cylindrite, franckeite, canfieldite, and teallite. Minerals with tin are almost always associated with granite rock, usually at a level of 1% tin oxide content.

Applications

In modern times tin is used mainly in alloys. While this sounds like a limited usage, it is the alloys themselves that have a multitude of usages. Broadly speaking these days, apart from alloys, tin's main uses are in tin plating, solder and in the manufacturing of chemical compounds which are used in a variety of ways, from fire-proofing cloth, to making PVC stabilisers, pesticides and wood preservatives.

As the pie chart shows, tin's use in solders is the dominant application, most notably tin/lead soft solders, typically containing 60% or more of tin. Legislation was introduced in 2006 banning the use of



lead in electronics, tin then became the main metal in solder. The solder industry now equates for around 55% of tin consumption.

The second most important application is corrosion-resistant tin plating of steel. Because of its low toxicity, tin-plated metal is also used for food packaging, giving the name to tin cans, which are made mostly of steel. Tin's use in tin plating for

packaging competes directly with aluminium, but the packaging market is big enough for both of them to operate in and each packaging material has its own unique advantages. Tin-coated steel cans are more robust than aluminium cans, which has some advantages for tinned foods.

Amongst the myriad of other applications are:

- Important alloys include soft solder, type metal (though fading), fusible metal, pewter, bronze, bell metal, Babbitt metal, White metal, die casting alloy, and phosphor bronze
- Tin chloride ($\text{SnCl}_2 \cdot \text{H}_2\text{O}$) is used as a reducing agent and as a mordant in calico printing
- Tin salts sprayed onto glass are used to produce electrically conductive coatings. These have been used for panel lighting and for frost-free wind-shields
- Window glass made by the Pilkington Process floats molten glass on molten tin (float glass) to produce a flat surface (though the tin is largely reusable in this process with only incremental increase in glass demand increasing tin usage in this industry)
- A crystalline tin-niobium alloy is superconductive at very low temperatures. Such magnets, made of tin-niobium wire, weigh just a few pounds and produce magnetic fields that are comparable to that of a 100 ton electromagnet
- Trialkyl and triaryl tin compounds are biocides. However there are concerns over their environmental effects. Tributyltin is the active ingredient in a type of anti-fouling paint used on ships.

The uses of tin don't resonate in the same way as Rare Earths did in 2010 with edgy new technologies and sexy applications but Tin has the advantage that it is not exactly troglodytic either with extensive usage in electronics particularly micro-electronics. Beyond that Tin is one of the largest volume specialty metals without the danger of being made redundant by technological change. Rare Earths are a mere sideshow in comparison.

Mining Methods

Cassiterite (SnO_2), the tin oxide form of tin, is the most mined tin-bearing mineralization. Other forms of tin ores are less abundant sulfides such as stannite that require a more involved smelting process. Cassiterite often accumulates in alluvial channels as placer deposits due to the fact that it is harder, heavier, and more chemically resistant than the granite in which it typically forms. These deposits can be easily seen in river banks as cassiterite is usually black, purple or otherwise dark in color, a feature exploited by early Bronze Age prospectors. It is likely that the earliest deposits were alluvial in nature, and perhaps exploited by the same methods used for panning gold in placer deposits.

Because of the higher specific gravity of tin dioxide, about 80% of mined tin is from secondary deposits found downstream from the primary lodes. Tin is often recovered from granules washed downstream in the past and deposited in valleys or under sea. Therefore the most used tin mining practice in recent decades has been dredging, which is particularly applicable for the relatively high-grade alluvial cassiterite deposits found in Malaysia and Indonesia. Dredges usually operate by creating firstly a pool then the dredge is placed in the pool and moves forward expanding the pool in a particular direction with the mined area being backfilled with the waste material after separation.

At its peak between 1954 and 1964 the Malaysian tin mining industry had 75 dredges operating, and

supplied 45% of the world's tin demand.

Below can be seen the Tanjung Tualang Dredge No 5, which at its time, was one of the largest mining machine of its kind. It was three-storeys high, weighed 4,500 tonnes and was supported by a pontoon 75 meters in length, 35 meters in width. Its chain of 115 digging buckets which could dig 15 meters deep. Despite its massive size it was operated by 17 workers per shift.



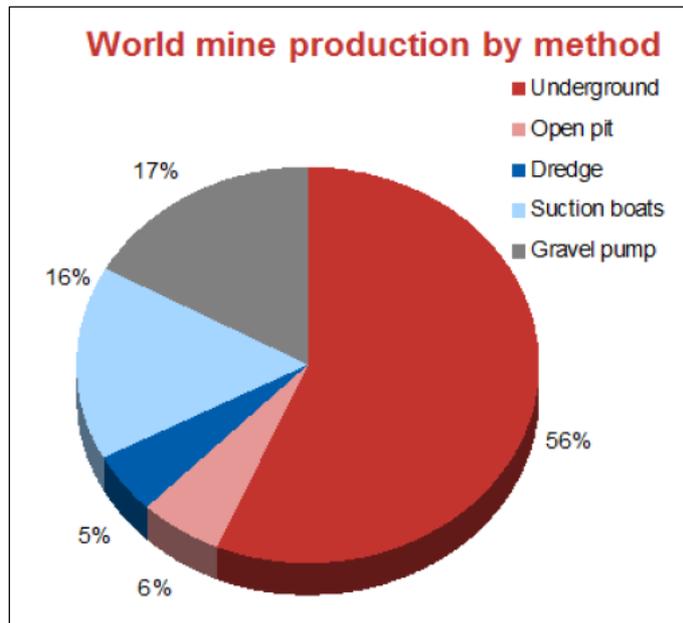
It is worth noting that Malaysia's residual position as a Rare Earth producer is because REEs were a by-product on the cassiterite mining.

Large scale dredging lost dominance as the main alluvial method in the early 1980s. In South-East Asia particularly, smaller deposits, or those unsuitable for dredging (e.g. because the bedrock is very rough) are worked by gravel pumping.

Meanwhile the decreasing supply of easy pickings via dredge and suction pump mining has tipped the balance in favour of hard rock mining. The chart below from International Tin Research Institute shows the current state of play.

Vein and disseminated tin deposits are mined by the same methods used in hard-rock mining of other non-ferrous ores such as zinc. The ore is broken by drilling and blasting, transported to a concentrator where it is crushed and ground and then concentrated primarily by gravity methods. The concentrate is usually of a lower grade (typically 40-60% Sn) than placer concentrate because of the fine grain size of

the cassiterite (tin oxide) and the difficulty of removing all the associated sulphide and other heavy minerals. Flotation is not as efficient for tin ores as it is for sulphide ores.



Source: ITRI

Hard-rock underground mining is predominant in China, South America and Australia, although there are some open pit operations in all these places.

The international Tin Research Institute (ITRI) is a trade body that produces the best data on the industry and includes all the major players as members. In some ways it is the heir to tradition of the much-maligned International Tin Council upon which we shall elaborate anon.

The ITRI's estimation of the usage of different mining techniques is shown in the pie chart to the left.

Sources of Production

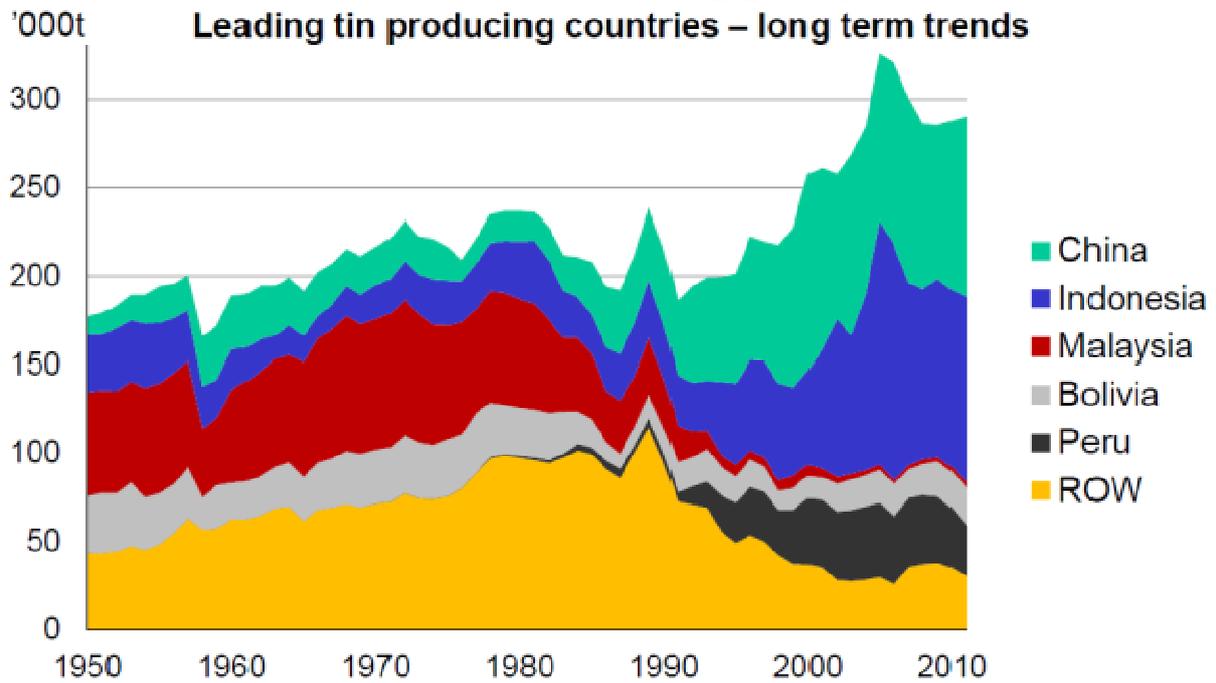
We have mentioned the various mining styles but it should also be noted that secondary, or scrap, tin is also an important source of the metal. The recovery of tin through secondary production, or recycling of scrap tin, is increasing rapidly. Whereas the United States has neither mined since 1993 nor smelted tin since 1989, it was the largest secondary producer, recycling nearly 14,000 tonnes in 2006.

Estimates of tin production have historically varied with the dynamics of economic feasibility and the development of mining technologies, but it is estimated that, at current consumption rates and technologies, the Earth will run out of tin that can be mined in 40 years. Some more apocalyptic commentators have suggested tin could run out within 20 years based on a conservative extrapolation of 2% growth per year.

While China is the largest tin producer by a long way, it does not have the dominant position that it holds in many other specialty metals. About 253,000 tonnes of tin were mined in 2011, mostly in China (110,000 t), Indonesia (51,000 t), Peru (34,600 t), Bolivia (20,700 t) and Brazil (12,000 t).

The three largest producers are:

- Timah PT – Indonesia (30,000t)
- China Yunnan Tin - China (27,000t)
- Minsur – Peru (25,000t)



Source: ITRI

China is the country with the largest reserves by far but as always with Chinese numbers one must be vigilant for misinformation in estimates either to the upside or downside depending on what suits the purpose of the Chinese on any given day.

World tin mine reserves in 2011			
Country	Reserves	%	
China	1,500,000	31%	
Malaysia	250,000	5%	
Peru	310,000	6%	
Indonesia	800,000	17%	
Brazil	590,000	12%	
Bolivia	400,000	8%	
Russia	350,000	7%	
Thailand	170,000	4%	
Australia	180,000	4%	
Other	180,000	4%	
Total	4,800,000		

Source: USGS

The table at the right shows the economically recoverable tin reserves at various points over the last few decades. It is interesting to note the ups and downs in the numbers over time. This is due, we presume, to the fact that certain reserves are not recoverable at times of very low prices (such as 1985) which therefore shrinks the size of recoverable reserves.

The current high prices should expand this number again but like so many other metals, prolonged under-investment and generalized grade decay due to high-grading and plain old exploitation lay the ground for a scenario that at any price the amount of tin in reserves cannot be expanded.

New deposits are reported from time to time in non-traditional locations such as, in recent times, in southern Mongolia, and in 2009, new deposits of tin were discovered in Colombia.

Tin Price Dynamics

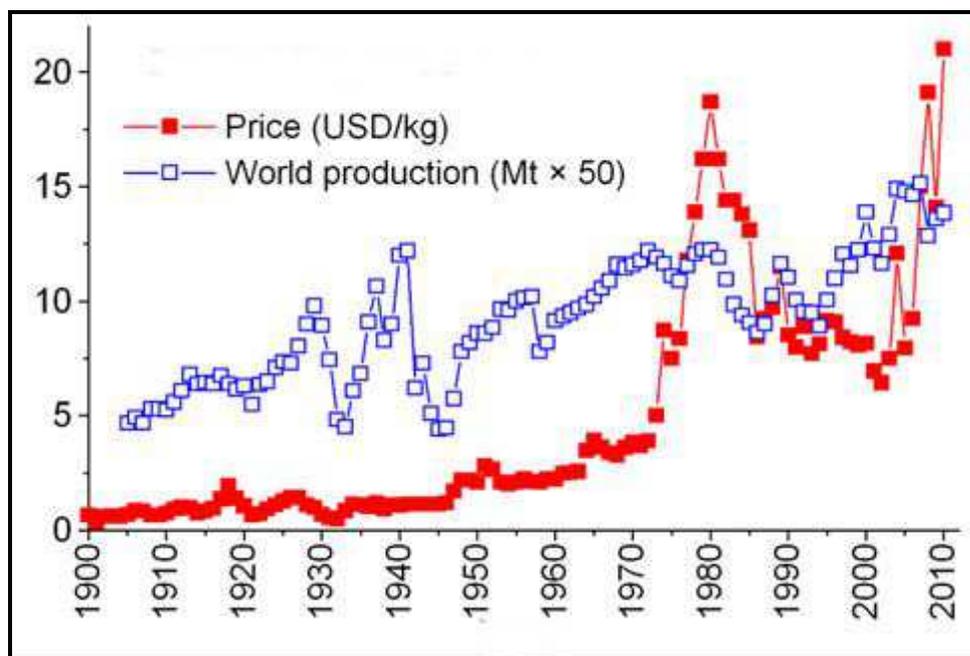
The major trading venue for tin is the London Metal Exchange (LME) while other tin contract markets are Kuala Lumpur Tin Market (KLTM) and Indonesia Tin Exchange (INATIN).

Tin has long been subject to a form of price stabilization, that almost equated to a cartel. This situation was held in place by complex "agreements" between producer countries and consumer countries dating back to 1921. The earlier agreements tended to be somewhat informal and sporadic; they led to the "First International Tin Agreement" in 1956, the first of a continuously numbered series that essentially collapsed in 1985. Through this series of agreements, the International Tin Council (ITC) had a considerable effect on tin prices. The ITC supported the price of tin during periods of low prices by buying tin for its buffer stockpile and was able to restrain the price during periods of high prices by selling tin from the stockpile.

This was a classic cartel-type action, designed to assure a sufficient flow of tin to consumer countries and a decent profit for producer countries. However, the buffer stockpile was not sufficiently large, and during most of those 29 years tin prices rose gradually. However, from 1973 through 1980, when rampant inflation plagued many world economies, the price soared, as can be noted from the price graph on the following page.

The most dramatic price surge had no correlation with production, though notably the subsequent price plunge did result in a substantial retreat in production volumes.

Economically Recoverable Tin Reserves	
Year	Million tonnes
1965	4,265
1970	3,930
1975	9,060
1980	9,100
1985	3,060
1990	7,100
2000	7,100
2010	5,200



Source: USGS

During the late 1970s and early 1980s, the U.S. Government tin stockpile was in an aggressive selling mode, partly to take advantage of the historically high tin prices, but also due to the now infamous decision to shrink strategic stockpiles that has let the US in the vulnerable position that it's in today.

The sharp recession of 1981–82 proved to be quite harsh on the tin industry. Tin consumption declined dramatically. The ITC was able to avoid truly steep declines through accelerated buying for its buffer stockpile; this activity required the ITC to borrow extensively from banks and metal trading firms to augment its resources. The ITC continued to borrow until late 1985, when it reached its credit limit. Immediately, a major “tin crisis” followed — tin was delisted from trading on the London Metal Exchange for about three years, the ITC dissolved soon afterward, and the price of tin, now in a free-market environment, plummeted sharply to \$4 per pound and remained around this level through 1990s. It rebounded again by 2010 due to an increase in consumption following the 2008–09 world economic crisis, restocking and continued growth in consumption in the world's developing economies.

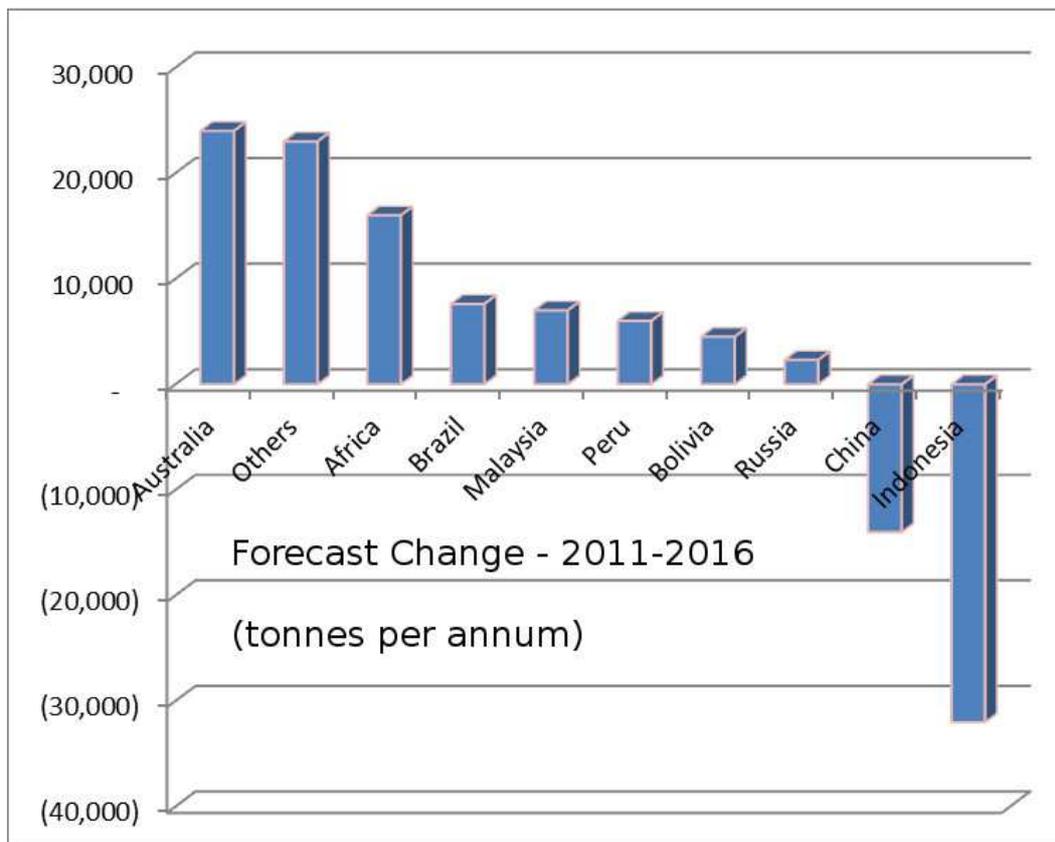
The Brewing Crisis

One risks becoming a “Chicken Little” when claiming these days that a catastrophic supply crisis is building up in any metal as so many have been proven wrong across a whole swathe of metals in recent years.

However with tin the dynamics are a lot clearer than in say Rare Earths. With tin, the applications are not particularly exotic, the metallurgy is simpler and the supply sources are not many but they are more varied than REEs or Antimony, where the Chinese dominate. Thus we can clearly see which of the truisms being bandied about are actually true. And what are these truisms?

- Easy-to-access alluvial tin is in decline
- Indonesia is restricting access to its tin concentrate
- Western countries, excepting Australia, scarcely figure in tin production
- Much of the production, outside of the major producers, is artisanal
- Those new projects that have realistic prospects of being built tend to the smaller side
- Grades are in decline and high prices are required to justify building mines with progressively lower grades
- Finance for new builds is very tough in capital markets, this leaves offtake funding as the main avenue which tends to have production disappear into the maw of a trading house
- Greenfields exploration is nearly non-existent with most focus on past-producing areas

We welcome parties to critique this list of truisms but they do tend to be true. The sum of these truisms is best seen in the chart below which shows a particularly dire supply outlook over the next half decade.

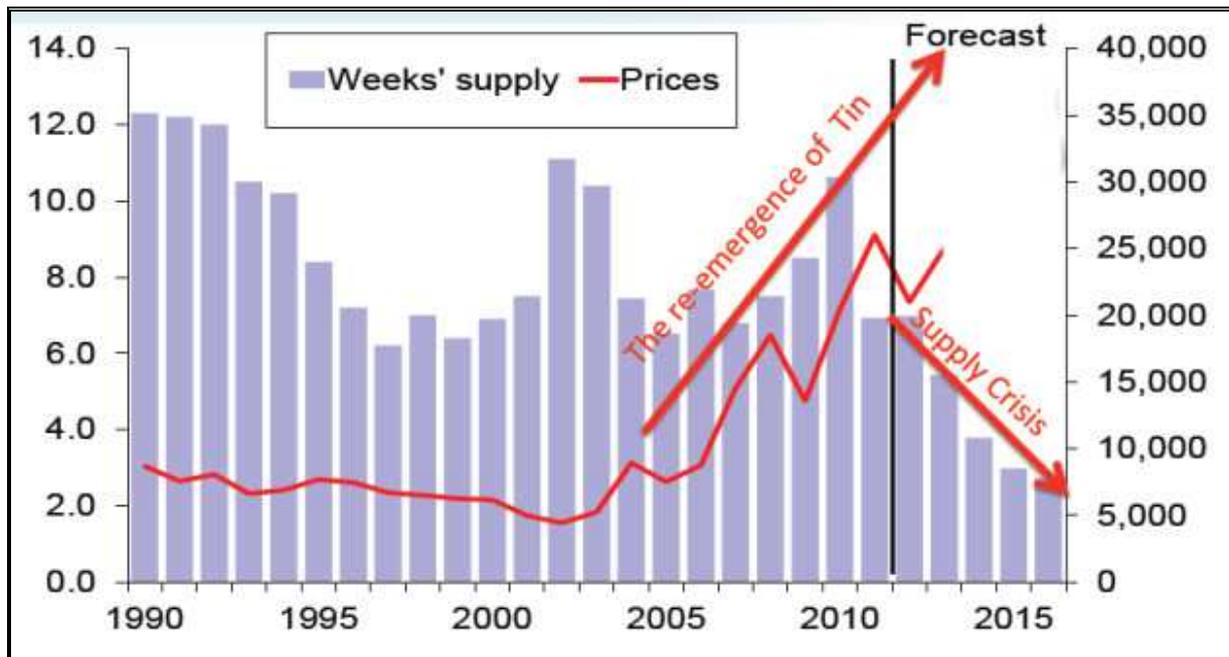


Source: ITRI

One of the major gurus of tin at the current moment is Peter Kettle, who produces the bulk of the output of the ITRI. Of course the ITRI's members have a vested interest in seeing higher tin prices and yet he paints a somewhat sanguine view of potential production in the bar chart above. This chart however conceals some disturbing facts. It only projects as far as 2016, which is not that far away. For example, it shows Peruvian tin output rising but Minsur, which operates San Rafael in Peru (the largest tin mine in the world supplying ~10% of the global market) has stated that it expects the mine to be

exhausted by 2017.

And from the companies that we mention further on in this report, we can see that should a goodly number of them get to production, but none of them are anything but faint shadows of a giant mine like San Rafael.



The above projections produced by those of the *Apocalypse Now* school of tin theorists clash (in a fashion) with the latest prognostications of the USGS. According to the USGS, in 2010, global production of refined tin was about 321,000 t. They projected it to increase to 343,000 tpa by 2013, 362,000 tpa by 2015, and 385,000 tpa by 2017. They projected that, in China, annual production capacity was expected to increase to 180,000 tpa of refined metal by 2017.

In Indonesia, the Yunnan Tin Co. Ltd. planned to develop a tin smelter, which would increase the country's production capacity to 55,000 tpa by 2017. In Thailand, production capacity is expected to increase to 30,000 tpa by 2017. These predictions were made before Indonesia threw its spanner in the works. An X factor is the amount of the Chinese refined product that is in fact not sourced from Chinese mines but elsewhere, notably Indonesia. The comments on Thailand are interesting because no-one else speaks of Thailand as a player but it is not surprising considering the similarities in regional geology.

An important thing to note also is that the preceding chart is referring to week's supplies of tin whereas the USGS is referring to gross production. Prices tend to move when supply is tight more than anything else. So the week's supply numbers are the ones that will light a fire under prices and produce most concern.

The ITRI forecasts that 70,000t p.a. increase in new supply will be required by 2015 and estimates the capital cost per installed tonne of tin production as \$30,000 implying investment of \$2.1 billion by 2015.

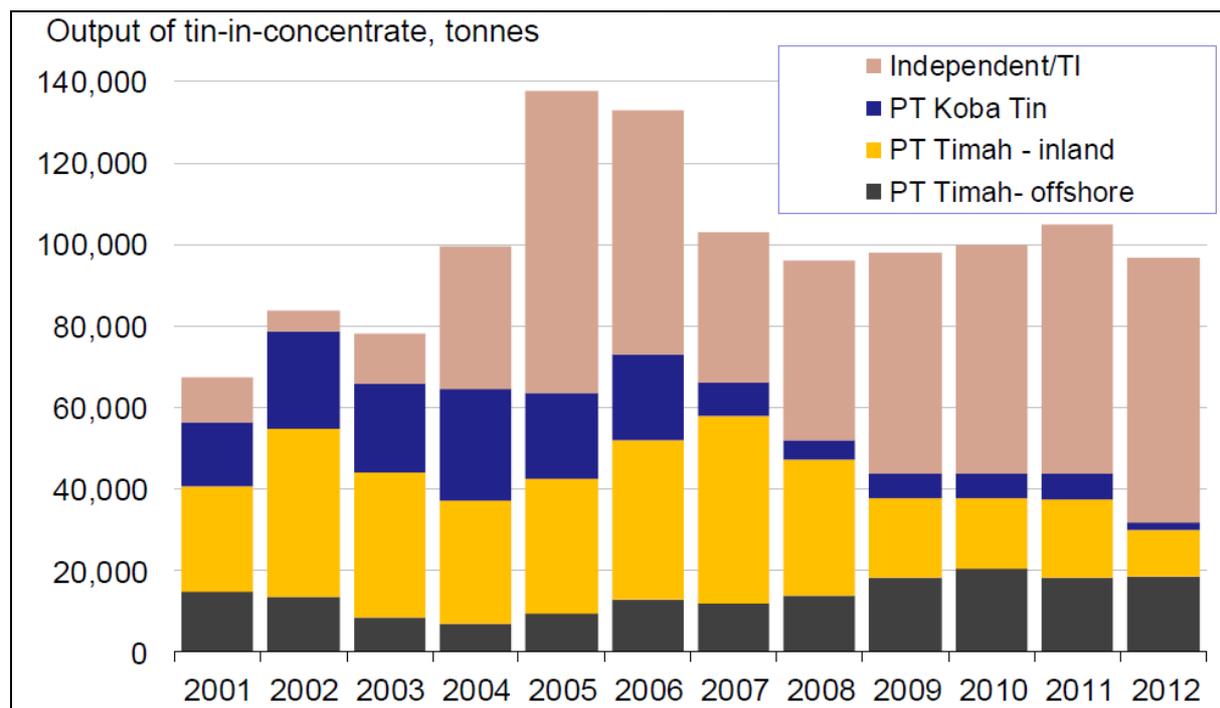
Mining sectors mavens are constantly hunting for some news to underpin their views on why they should be bullish or bearish on some metal irrespective of the import of the news. We are often asked by journalists “why is copper up today?” and our response is usually “more buyers than sellers” which leaves them nonplussed.

The Indonesian Export Ban

In the case of tin it is scarcely a situation in which one needs any more good “bad news” but the actions of the Indonesian government this year have been icing on the cake for a sector that was already facing a supply shortfall in the face of a demand ramp-up.

We have seen a number of countries in recent times introduce measures (largely export curbs on concentrates) to try and keep more of the value-added chain in-country, a good example of this was actions that the DRC took effecting copper and cobalt ores.

Indonesia too has joined this bandwagon announcing that on 1st January 2014 it will implement a law prohibiting the export of unprocessed metals, including tin, as part of a drive to refine the ores and potentially generate higher margins.



Source: ITRI

As the largest player besides China, Indonesia is the force to be reckoned with. And its latest actions have roiled the tin market. We shall go over those anon, but it’s worth looking at the chart above which shows that production in the South East Asian nation has been gradually moving from state and major players to smaller players. Not only are a plethora of juniors more difficult to herd with government policy they also cannot be coerced towards building refineries towards further upgrading of

concentrates in the same way that majors can. So what has gradually transpired is a shift towards a more fragmented industry upon which the Chinese buyers have then employed a *divide and rule* strategy whisking the concentrate back to the mother-ship for on-processing.. well now the worm has turned..

The Exchange Issue

In what is ostensibly a lesser issue, but not regarded as such by the Indonesian government, there is also a change in trading requirements in tin. In a move presumably designed to lessen the LME's dominance in tin and boost Jakarta as a financial centre, at least in commodities the country produces, the government also introduced a requirement that tin be traded on a local exchange before shipment. This cuts the LME out. At present, only the Indonesia Commodity and Derivatives Exchange (ICDX) in Jakarta is allowed to trade tin ingots before export. There is a request in process from the Jakarta Futures Exchange to trade another tin contract but the commodity-trading regulator hasn't approved a proposal. This latter contract reportedly has the support of 18 of the country's 47 registered tin exporters.

All is not as simple as the government thinks as the measure has been taken without really considering the inherent flaws in the existing tin trading that happens in Jakarta. For instance Reuters quoted one Singapore-based trader that said that the current contract requires a very high margin deposit for every trade, with commission being very high and the liquidity is "very, very low". The latter aspect though is presumably one of the reasons the government wants to channel more business through the ICDE. More importantly maybe was another commentator's observation that currency risk was a big issue given the mismatch of daily pricing of the Indonesian contract to global benchmark LME official prices. He went on to say: "That must make the trading of the metal next to impossible - you'd spend 60-70 percent of your income hedging the currency and hedging tin as well".

Here we have yet another example of government's stumbling into the financial markets without having a good grasp of the minutiae of trading in arcane metals.

The Effects and Response

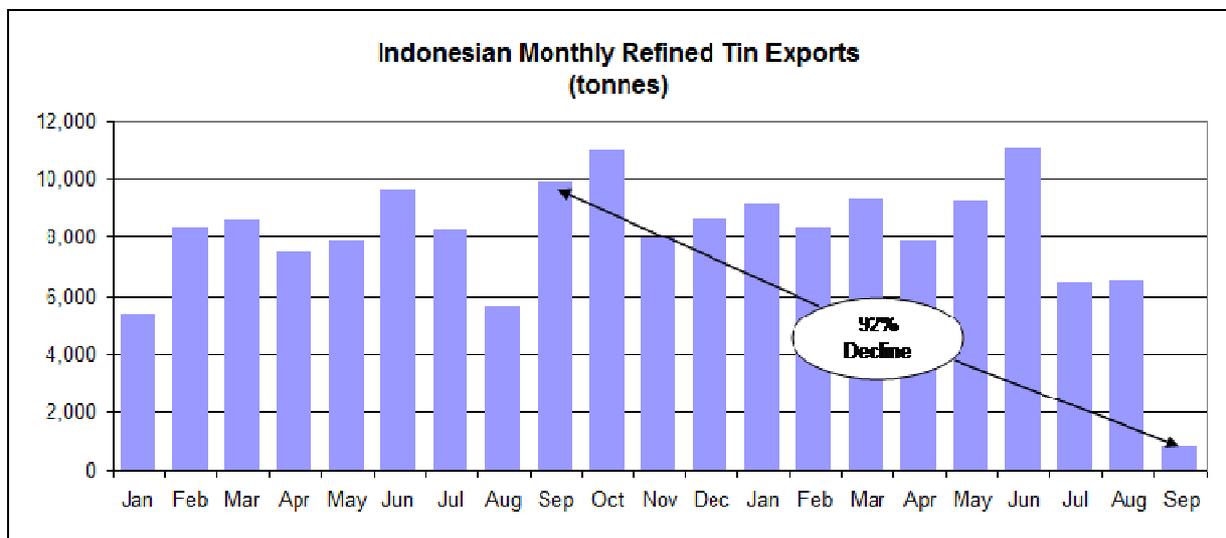
The combined moves did not go down well with the country's chamber of commerce (Kadin) which warned that Indonesia's mining industry would collapse if the government moves ahead with a planned ban on the export of coal and tin and nickel concentrates.

The Financial Times reported that both mining companies and independent economists were critical of the move, arguing that at current depressed global prices for both raw and refined minerals, it is not a financially viable option in infrastructure- and energy-poor Indonesia, especially with no commitment to invest from the government.

The FT also reported that a report funded by the US Agency for International Development had argued that the push towards refining coupled with the ban would create few jobs and could lead to \$6.3bn of lost economic benefits annually by prioritising spending on refineries with "poor commercial prospects" over other "pressing needs" for capital investment, for example in the country's decrepit education, health and infrastructure systems. What USAID knows about the economics of refining can be written

on the back of a small postage stamp so we would interpret this as a rather desperate attempt by the powers that be in end-processing and trading resisting being forced into developing a domestic refining industry. If Indonesia was a minor player in the ranks of global tin we would see it as folly to be pursuing this path but as it is a lead exporter the country clearly has a case that more of the value-added should remain onshore. For too long leading countries in particular metals categories have been seen as jumbo-sized quarries and nothing more.

Some of the prognostications smacked of *Apocalypse Now*. The FT reported Garibaldi Thohir, a vice-chairman of Indonesia's chamber of commerce as saying that "If the government implements a full ban, the whole industry will collapse," given that there are only a handful of smelters in the country. Some of these complaints though are more linked to the issue of nickel than of tin.



Source: Stellar Resources

The new rules started having an effect some months in advance of the official start date with the nation's biggest tin producer, state-backed PT Timah, halting shipments and declaring *force majeure*. P.T. Timah declared force majeure as customers had not registered to trade tin on the ICDX. At that time (November) the firm expected exports to improve over the last two months of the year. Surprisingly the president of Timah was reported by Bloomberg in October to be "fine" with the situation. His rationale was that the company had a good stockpile and that they expected prices to breach the \$25,000 mark and they would make more money by selling later at higher prices.

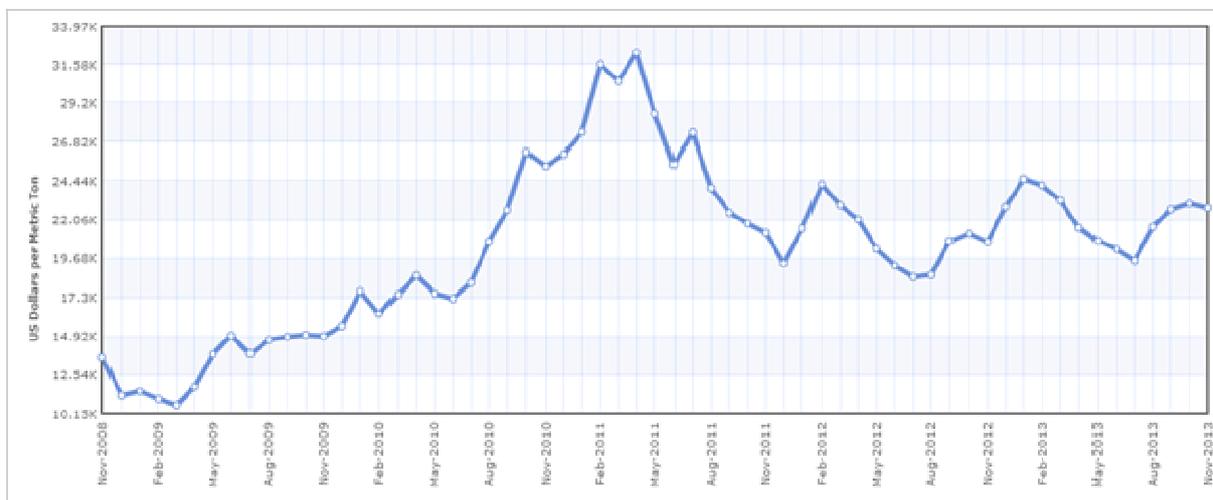
At that time of the FT's report there was still over two months to go before the ban came in and the press were saying that the government and many mining companies were engaged in a game of brinkmanship. However it was more the business side that were playing a risky game betting that the government will not risk losing billions of dollars in tax revenues and royalties by halting exports. Some expected the government to compromise by allowing companies that commit to building smelters to export minerals or raising export taxes on those that do not. As we all know those types of promises go by the wayside, with the usual excuse of "market conditions" being touted, at the first sign of price weakness in the metal. Players who deceived themselves that the government would fold have found that they have made a wager they have now lost.

Indonesia’s government is clearly placing a bet itself that it thinks will pay off large because in the short-term there shall be some pain. Some projections were that Indonesian refined tin shipments were expected drop by around 75% in September-December from the same period of 2012. The FT quoted another industry source, the director of the minerals and coal division at PT Sucofindo - a state-owned company, estimating that from September until year-end, the country would likely ship only 10,000 tonnes of tin compared with around 38,000 tonnes in the same period in 2012.

The Western economies should reflect upon the fact that all this might actually play into their hands to have the Chinese forced into buying already processed metal as it weakens the longer-term ability of the Chinese to transfer all elaboration on-shore to the exclusion of Western users. The Chinese attempts to not only dominate mining of Antimony and Rare Earths and also their value-chains are directly threatening to Western interests.

Price Outlook

It is the fate of strategists to have to make calls on metal prices that almost inevitably are proven wrong over the medium term. The chances of being wrong are narrowed over the short term when momentum is going one’s way and improved further when dynamics of supply (rather than demand) are fairly clear cut. The table below shows the metal is in a good place but we would not say the chart has shown much momentum since its surge between 2009 and early 2011. While investors love upward movement most tin users and miners would prefer the type of range-bound movement seen since late 2011 than boom and bust scenarios.



That leaves us with supply considerations. The best thing that can be said is that the situation was tight even pre-Indonesian measures. Good prices for four years have done nothing to tease out real production additions. Most of the companies we cover in the latter half of this piece are production wannabes. Most, with the best will in the world, will be producing as much in a year as Indonesia produces in a month. And most of the putative producers will not be functional for another 18 months. Indonesia is not out of the market on a permanent basis it is just indulging in some behavior

modification of the existing players. They (the traders/end-users) will have to play by the new rules to get what they want. Meanwhile usage continues to rise with global economic growth and grades continue to decline. New (or revived) production will only provide enough output to meet annual needs for a couple of years out. New mines will be needed and capital markets (or traders) will have to fund the explorers/developers. This makes for a promising scenario for upcoming tin players.

Whither the Listed Miners

In a frank exchange with Peter Cook, the CEO of Metals X (a company discussed later in this review) he noted "in recent years the secret tin society has been stripped bare by extensive research by ITRI's Peter Kettle. This shows an overwhelming emerging supply crisis for tin. Despite this and nearly every metal price forecaster picking tin to be a strong performer, the price has gone sideways for the past year. It appears locked in a range between US\$21,000 & US\$23,000. Is this the exposure of modern day non-physical trading impacts on the smallest of all metal markets on the LME? Have the speculators found a nice niche to trade within in a market they can move on very little (non-physically backed) trades with derivatives. Does this spell the start of the end of the LME as the benchmark and platform for international tin trading? Whatever the answer, the trading price of tin remains grossly at odds with the impelling case of an emerging supply crisis presented by ITRI's Peter Kettle.

The impact on the listed tin producer or emerging tin producer is dire. Whilst the investors want to buy and believe Kettle's view - the price has grossly disappointed and they have become fed up and are abandoning the tin story. In the long term this will probably exacerbate the supply crisis. In the meantime, the industry needs to rid itself of the non-physical trading parasites from the industry before they suck the life out of it for their personal gain".

Those comments cover the gamut of issues that pre-occupy (and in some cases excite) investors. The chief theme though is one of a transition. We would not go so far as to blame speculators in the physical metal alone for current low valuations. The market for all miners is dire and we believe if we were back in 2010 with the current crop of near-producing tin companies and prices in the current range then the most promising miners (who are clearly more advanced than they were back when tin was just re-awakening) would have valuations that were multiples of their current subdued levels.

Tin, despite its excellent auguries, has been caught in the mire of dead equity markets and the backwash from the various "fad" metals of the last five years. No-one wants to wake up and find they have been scammed again as they were in Lithium, Rare Earths and (nearly) in Graphite. A mention might be made here of an object lesson from one of the most interesting tin revival stories which was the TSX-listed Celeste Mining that latched onto the historic South Crofty mine in Cornwall in the UK several years back and started moving it back towards production. The perils of the financing market came to bear and the company lost the asset in mid-2013, once again stymying the revival of tin mining in the UK's historic tin heartland.

Wariness of boom/bust price cycles now meshes with torpor in the broad range of mining stocks to produce a generalized price paralysis. The thing that might break this cycle of lassitude may very well be the machinations of the Indonesian government.

Alphamin (AFM.v)

Strategy: Short

Key Metrics		(Yr end Dec)	2012	2013e	2014e
Price (CAD)	\$	0.40		n/a	n/a
12-Month Target Price (CAD)	\$	0.35		(\$0.05)	(\$0.07)
Upside to Target		-13%			
High-low (12 mth)		\$0.10 - \$0.40			
Market Cap (CAD mn)	\$	53.6			
Shares Outstanding (millions)		134.1			
Shares O/S Fully Diluted (mns)		151.0			
			Actual EPS		
			P/E		

It is surprising to see a TSXV-listed entity working with a specialty metal get a jump on other players (in the ASX for example) but that is exactly what Alphamin appears to have achieved. The secret though would appear to be that the company is Swiss-run rather than led by the same old Vancouver promoters who tend to talk much and achieve little.

The company's wholly owned subsidiary, Mining and Processing Congo sprl holds 100% ownership over five exploration permits which cover 1,470km² of prospective ground in the North Kivu Province. The company's main asset is the Bisie Tin Project in the DRC. It is located roughly 140 km west-northwest of the regional centre of Goma and about 40 kms from the Ugandan border.

Tin was first discovered at Bisie in 2004 and was mined by artisanal miners (down to 80 metres) from two main target areas, Gecomines and Golgotha. Both targets are located along 1.5km of a ridge which extends over more than 9km. Artisanal mining from Bisie in the past has dominated the DRC's production by supplying up to 70% of the cassiterite exported from the country.

The company claims it has a unique style of mineralisation at Bisie, which includes high grade tin, copper, zinc, lead and rare earth minerals.

Alphamin completed its first 2,400m drilling programme between June and December 2012 to test the true width and grades of tin mineralisation at both target areas. A second drill programme was completed in August 2013 which focused on resource drilling at the Gecomines prospect, with a further 28 holes drilled for 3809m. The program showed that cassiterite was emplaced in massive veins ranging in thickness from 2mm to 0.64m, generally within high grade chutes with an apparent shallow plunge to the north.

The better tin intercepts from the initial program included:

- 25.85m @ 2.26% Sn from 47.65m including 5.8m @ 8.55% Sn
- 12m @ 3.15% Sn from 53m & 3m @ 6.14% Sn from 80m
- 18.5m @ 2.21% Sn from 53m including 2.9m @ 6.27% Sn

- 11m @ 1.48% Sn from 71m including 2.5m @ 5.76% Sn

The second drilling program intercepted a second, deeper zone with exceptionally high grades:

- 29m @ 3.3% Sn from 165m including 11m @ 6.06% Sn
- 17m @ 6.78% Sn from 185m including 4.35m @ 18.62% Sn
- 15m @ 7.94% Sn from 171m & 7.65m @ 9.40% Sn from 192m
- 17m @ 3.27% Sn from 133m

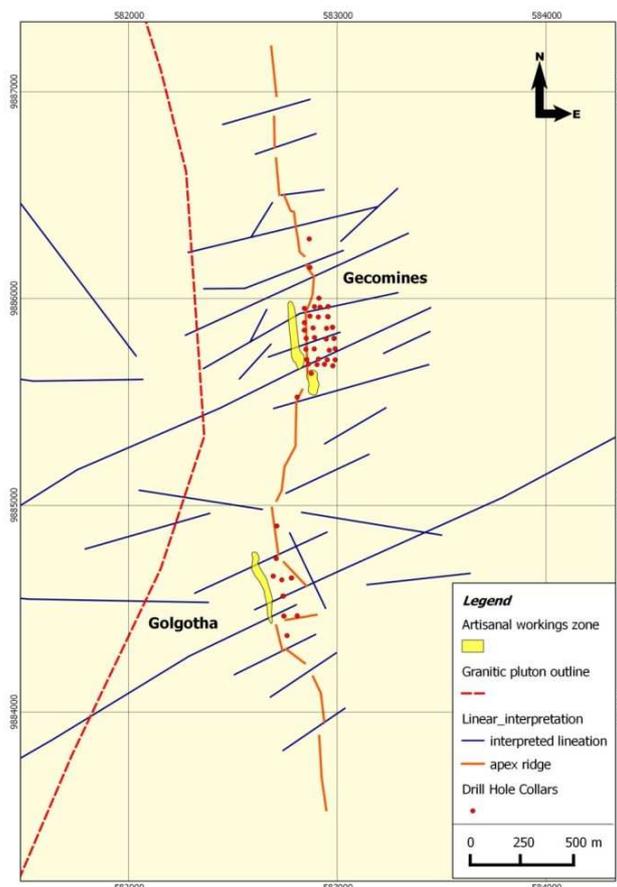
Tin mineralisation is better developed at Gecomines with thicker and more numerous cassiterite veins and substantial copper mineralisation in parts. Golghota has less cassiterite and veins are normally thinner, however the lead and zinc mineralisation is more prevalent, likely due to the presence of the massive pyrite unit. However by any measures these drill results display great grades, as most other projects are touting 1% grades as their best readings. The company is targeting what it believes is a resource of >500,000 tonnes of tin metal at this site.

In late November 2013 the company announced a maiden Inferred Mineral Resource at the Gecomines target. The Inferred Resource was defined over 400m strike to a depth of 220m and is open at depth

The Gecomines Target Inferred Mineral Resource currently comprises four million tonnes @ 3.5% Sn for 141,200 tonnes of contained tin (at 0.25% Sn cut-off). Drilling was conducted on a grid of approximately 50m x 50m down to depths of 220m. The best results were reported from the four deepest holes drilled to date.

Financing

The key to any project in this day and age though is financing and Alphamin have recently managed a coup in the form of a very sizeable capital injection from a portfolio investor dedicated to African mining projects. In early December 2013, announced that it was undertaking a non-brokered private placement of 100,000,000 common shares at an original price of \$0.12 per common share. However this was raised at the closing of the deal to 13.5 cts per share in a very intriguing development. The sole investor was Tremont Master Holdings that, upon closing of the placement, now owns approximately 39.81% of the shares of the company on an undiluted basis. Tremont Master Holdings is a Mauritius-based investment company focused on African exploration and



mining opportunities. This issue puts Alphamin in a strong position with \$13.5mn flowing into its coffers.

Tremont have indicated that the acquisition of the shares is being made for investment purposes. Tremont are entering into a pre-emptive rights agreement whereby Tremont will have the right to participate in any subsequent equity offering on a pro rata basis. This right will continue until the earlier of five years from the closing of the private placement and the date on which Tremont and its affiliates hold less than 20% of the issued and outstanding shares of Alphamin. Additionally, Tremont will be entitled to appoint two out of five directors of the company.



Source: Alphamin

The photo above shows the artisanal miners who work the surface expressions at the deposit.

The Wrinkle

It is almost inevitable that any discussion of a DRC project will eventually turn to some sort of problem. In recent months there have been delays in exploration and drilling. In August 2013 all staff were evacuated due to hostile rebel activities in the immediate surrounds. The field camp was raided in early November by a group of villagers who caused damage to company equipment and assets. The company said at the time that it would assess the security situation on site and that work would only resume once calm has been restored to the area and staff could return to the project site safely.

Conclusion

This transaction with Tremont does not seem all that burdensome at the moment and puts Alphamin in a very cashed up position. Now the market needs to be persuaded that a PEA shall swiftly follow giving us an idea of how much the capex will be to get this into production and what the timeframe might look like. Alphamin is quite clearly a serious contender and the grades imply that it will be much more viable at lower prices (not that we foresee those) than almost all other projects. The DRC does not spook us but its tendency to favour on-shoring (at least in copper/cobalt concentrates) raises the possibility of a potential wrinkle in export strategy. We would rate Alphamin as a **Short** only due to its recent surge taking it past our 12-month target price of 35 cts. We had initially rated it as a Long when we started writing this piece due to its cashed up position at this point. Should it pull back then it would indeed be a Long proposition again.



Kasbah (KAS.ax)

Strategy: Neutral

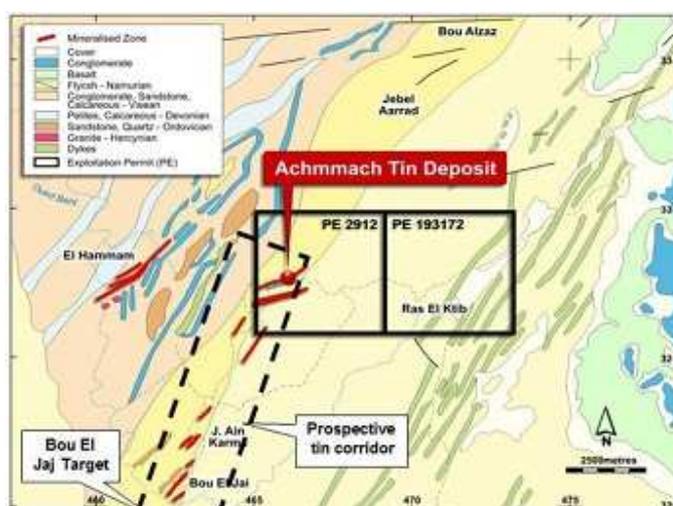
Key Metrics		(Yr end June)	2013	2014e	2015e
Price (AUD)	\$ 0.13	Consensus EPS		(\$0.01)	\$0.00
12-Month Target Price (AUD)	\$ 0.15	Hallgarten EPS		(\$0.02)	(\$0.01)
Upside to Target	15%	Actual EPS	\$0.00		
High-low (12 mth)	\$0.09 - \$0.19	P/E	n/a	n/a	n/a
Market Cap (AUD mn)	\$ 51.5				
Shares Outstanding (millions)	395.9				
Shares O/S Fully Diluted (mns)	416.4				

We have written up Morocco and its prospects before in the form of our enthusiasm for Maya Gold & Silver (MYA.v) which despite Mexican-sounding name is actually the holder of some very interesting past-producing territory in the North African country. Recently we had cause to look at Kasbah (strangely enough because it was wandering into a metal besides tin in Turkey) and found that its core business is actually tin in Morocco. The back ground to Kasbah is that it was established in 2005 and listed on the ASX in April 2007. So desperate is the need for new tin sources these days that it firstly managed to attract the interest of the second tier trading house, Traxys and then, when they could no longer keep up, in March 2012 Kasbah brought in the Japanese trading house Toyota Tsusho as a partner in the project. In late June 2103 this took another twist when it was announced that Nittetsu Mining of Japan would acquire a 5% interest in the joint venture entity that will develop the Achmmach Tin Project.

Kasbah's main play is the Achmmach Tin Project, which was discovered by the Moroccan government agency, the Bureau des Recherches et de Participations Minières, in 1985 and is located on the western edge of the El Hajeb province in Northern Morocco.

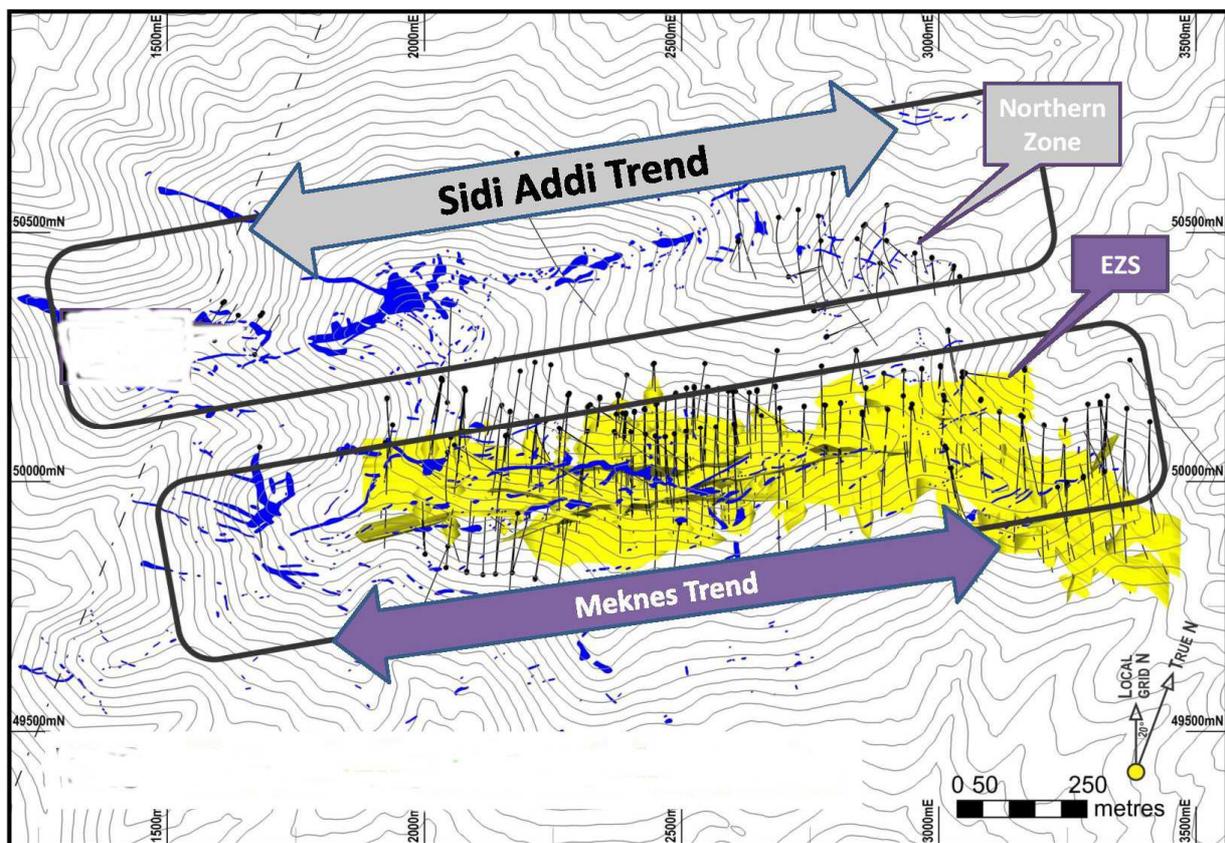
The project is approximately 140km southeast of the Moroccan capital Rabat and 40km south southwest of Meknes and consists of two Exploitation permits that cover an aggregate area of approximately 32 square kilometres.

Kasbah commenced site operations in 2007 with the objective to upgrade, expand and increase the Achmmach resource by additional diamond drilling, then advance the project through scoping study, pre-feasibility study, definitive feasibility study and ultimately full project development.



During the 2011/2012 period the company announced the results of a PFS to the market and commenced a definitive feasibility study on Achmmach. In early September 2013 it announced an increase in the measured resource from 500,000 tonnes to 1.6 mn tonnes and its measured resource from 6,000 tonnes to 16,100 tonnes.

This new calculation was the result of a 20m-spaced infill drill programme. The company also noted that the 40m-spaced program had provided a high resolution view across the total 1.6 km of strike of the Miknes Trend. It claimed the drilling showed that the tin system of the Meknes trend remains open at depth, and in conjunction with the parallel Sidi Addi trend, was prospective for potential additional resource and mine life extensions. The parallel trends are shown below. The tin resource of the Meknes trend is shown in yellow. The blue is tourmaline showings. Sidi Addi is a tin-tourmaline mineralisation.



The Mine Plan

Two portals are planned across the Meknes Trend (the Central Portal in the Meknes-Gap Zone and the Eastern Portal in the Eastern Zone) being the primary means of ore supply. Open pit ore modelling completed during the December quarter on the Eastern Zone Shallows target at Achmmach determined that extraction of these ore blocks by underground methods produced a better economic result.

In May 2012 the company published the aforementioned PFS. This estimated mine gate production costs of US\$65.76 per tonne of ore and project development costs of US\$167M (including all surface

infrastructure). The base case economic evaluation using a tin price of US\$21,961 per tonne delivered a rather modest after tax NPV of US\$79M. The NPV rose to US\$134M utilising the 2013 Consensus tin price of US\$24,407 / tonne. The salient features were:

- A mining inventory of 6.626 mn tonnes
- Mined ore tin grade of 0.93% Sn
- Average mill throughput of one million tpa
- Initial Mine Life of 6.6 years
- Tin recovery of 74%
- Average tin in concentrate production 6,880 tpa
- Capital expenditure to first ore delivery US\$167mn
- Mine gate costs of US\$65.76 per tonne of ore treated

The company now plans a definitive feasibility study (DFS) due for publication in the first quarter of 2014. The DFS was looking at the development of a one-million-tonne-a-year underground mine, concentrator and associated infrastructure. The DFS is being tweaked to account for the possible contribution from a small, satellite open pit from the Sidi Addi Trend. This is as a result of the publication of a maiden Indicated Resource on this trend of 1,380 tonnes of tin (grading 0.9% Sn) from the new trend in early January 2014.

First tin production was planned for 2015, but the DFS is already one quarter behind when it was initially supposed to be published due to the tweaking.

The Partnership Deals

The main source of funding for the move to the DFS was the deal with the Japanese trading company, Toyota Tsusho (which trades around 8% of the global tin market and more than 50% of all tin consumed in Japan). The Japanese trader is acquiring a 20% interest in the tin project.

To earn its 20% interest, Toyota Tsusho (TT) was required to make a series of payments to Kasbah, which would be used for exploration and development works at Achmmach, as well as finalise a joint venture agreement. Initially Toyota Tsusho paid Kasbah AUD\$1 million on signing the MoU, which is non-refundable, AUD\$4 million within 45 days of signing the MoU, AUD\$11 million within 60 days of completion of the Pre-Feasibility Study. These last of these payments was received in July 2012. This took TT to an 18.8% stake in the JV. There is a final payment to be calculated from the net present value of the Definitive Feasibility Study and paid within 90 days of completion of the study.

The final payment and signing of a joint venture agreement will secure Toyota Tsusho's 20% interest and entitle the company, on mutually agreeable commercial terms, to a minimum 20% offtake of tin produced from these two exploitation permits.

Then the Nittetsu deal appeared in late June 2013, under the terms of the MOU, Nittetsu Mining would pay A\$7.25mn for the right to acquire a 5% interest in the project. Nittetsu Mining will also be entitled to a minimum of 5% of the tin production from the Project based on mutually agreed market terms. The agreed funds were received by Kasbah in early July.

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Nittetsu Mining, established in 1939, is listed on the Tokyo Stock Exchange. It's business interests include metallic and non-metallic minerals, machinery engineering, environmental engineering and real estate. The Resources Division operates nine industrial mineral projects in Japan, whilst the Metals Division is the operator (and 60% owner) of the large, underground Atacama Copper Mine in Chile.

Nittetsu Mining's total sales in 2012 were approximately US\$1.23 billion with approximately 1700 employees. Its major shareholders include Nippon Steel Corporation (14.87%), Nittetsu Kogyo Shogakukai (7.7%) and several Japanese banks, including Mizuho Corporate Bank, Sumitomo Mitsui Banking Corporation and Bank of Tokyo-Mitsubishi UFG.

These two deals followed on a previous deal in April 2010 when the metals trader, Traxys, invested AUD\$1 million in Kasbah, taking 13.3 million ordinary shares at AUD\$0.075 per share. In the prior month Kasbah had raised AUD\$3.5 million in equity finance from the International Finance Corporation and African Lion Fund. As with the previous investors, Traxys, at that time, was granted options to take up additional shares over the next two years. The last we heard Traxys had a 3.3% stake (down from over 7%) in Kasbah.

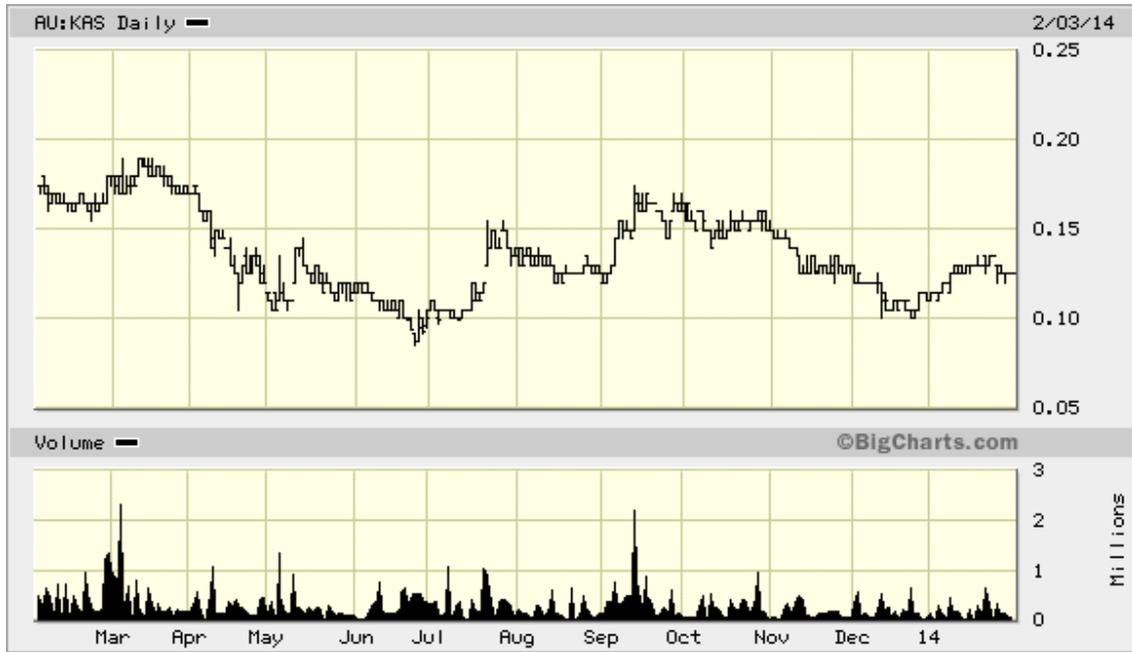
The cash position at 31 December 2013 was \$7.9mn.

Conclusion

The fact that two major trading houses and a Japanese mining company have given votes of confidence to this project is somewhat comforting, but the fact that the first one through the gate allowed a second one to come in behind them might imply that Traxys' interest in this asset is fading. While Achmmach certainly moves the dial in terms of absolute size it is also in virgin territory for foreign miners. The capex is very high, and scalability (downwards) does not seem like a viable option.

Our rating on this story is **Neutral** until such time as it can be proven that it the deposit can be realistically funded and developed.

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Pella Resources

Strategy: n/a

Pella Resources is a Guernsey-incorporated private firm. It was firm set up by Adonis Pouroulis, founder of Petra Diamonds. Usually we do not cover this type of enterprise but we find it worth a mention because it seems to have a high-chance of entering into production in the foreseeable future.

Pella is placing its bets on the advancement of tin mining in Africa, most specifically, which has long had a small, but consistent presence in the tin-mining industry. The company holds a license to mine cassiterite, tantalum and tungsten in Rwamagana district in Rwanda's eastern Province. These are known as the Musha–Ntungwa concessions and were privatized in 2012.

Belgian companies started mining, (mainly open pit), at Musha–Ntungwa in the 1940s and progressively handed over to artisanal mining subcontractors. The mine has produced cassiterite principally, and also to a lesser extent niobo-tantalite (also called coltan) and wolframite.

The origin of the mineralisation is related to pegmatitic intrusions and the cassiterite mineralisation is mainly found in pegmatite and quartz veins hosted in metasediments. The cassiterite content yielded in the past ranged from 1 kg per tonne to more than 10 kg per tonne. Up to the end of the 1990s, the total production of Musha was about 9 000 tonnes of cassiterite, a significant portion of which was mined from the alluvial deposits.

In September 2013 Pella Resources announced plans to invest \$22 million to extract tin ore at this deposit.

Rwanda currently produces between 600 and 700 tonnes of tin mineral ore a month for export, with production coming from conventional mines and artisanal operations. The largest producer is Tinco, that manages a mine (Rutongo) that was founded by the Belgians in the 1930s, nationalized and then reprivatized with a South African family and London funds (including Audley Capital) being the main shareholders. Rutongo produces from underground mines from which around 100 tpa of 71% Sn concentrate is despatched to Malaysia for further processing.

The government has reacted very positively to Pella's plans as these mesh with the stated ambition to triple the mining sector's revenues to around \$400 million in the five years to 2017. Mining is Rwanda's second largest foreign exchange earner after tourism.

Pella expect to be producing 50 tonnes per month within a year of the commencement of production, before ramping up to 120 tonnes a month by the end of the fifth year.

Conclusion

It's probably no surprise that the owners of this company have decided to advance the mine out of the public eye. However, we feel it is worthy of mention as a significant past producer at this location, a

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seemingly benign government attitude and a commitment to production. It may very well be that this company shall end up going public. The recent inclusion of outside investors at Tinco might imply that company might also debut. Both would probably find a most comfortable berth on the AIM rather than the TSX or ASX.

Metals X (MLX.ax)

Strategy: Neutral

Key Metrics		(Yr end June)	2013	2014e	2015e
Price (AUD)	\$ 0.19	Consensus EPS		\$0.03	\$0.04
12-Month Target Price (AUD)	\$ 0.33	Hallgarten EPS		\$0.033	\$0.038
Upside to Target	74%	Actual EPS	\$0.005		
High-low (12 mth)	\$0.08 - \$0.20	P/E	38.948	5.8	5.1
Market Cap (AUD mn)	\$ 313.9	Dividend	n/a	\$ 0.010	\$ 0.015
Shares Outstanding (millions)	1,652.0	Yield	0.0%	5.3%	7.9%

Metals X is differentiated from the rest of the companies in this coverage in that it is currently a tin producer through its 50% ownership of the Bluestone Mines Tasmania Joint Venture. However to confuse matters the company undertook a transformative step in the third quarter of 2013 when it snapped up the Australian gold assets of Alacer and became a major gold producer. This has muddied the waters for those seeking after a pure tin exposure.

The main asset of the JV is the Renison mine complex located on the west coast of Tasmania with its hard rock tin deposit. The partner in the JV is Yunnan Tin, one of the world's largest tin players. The key assets of the Joint Venture are the Renison Tin Mine, a 700,000 tonne per annum tin concentrator plant and the Renison Expansion Project (Rentails), a tailings recovery project. Renison remains the only major tin project in production in Australia, at least at the current moment.

In 1890 tin-bearing gossan was found near Argent River by George Renison Bell. He claimed land and formed the Renison Bell Prospecting Association. In 1934 "Paddy" O'Dea amalgamated adjoining leases and mines into the Renison Associated Tin Mines NL. Hard rock mining began in 1936, from an iron-sulphide cassiterite strata-bound replacement body in dolomite. The Renison Bell mine became the largest tin mine in the world.

The Mount Lyell Mining and Railway Company Limited acquired the mine in 1958 and new ore reserves were found at depth. In 1965, a sharp increase in the price of tin stimulated intense exploration. The mine owners, Renison Limited, embarked on a AU\$10 million development introducing a trackless cut and fill operation used diesel loaders and trucks via a decline into the ore zones. A combined gravity and flotation processing plant treated the ore.

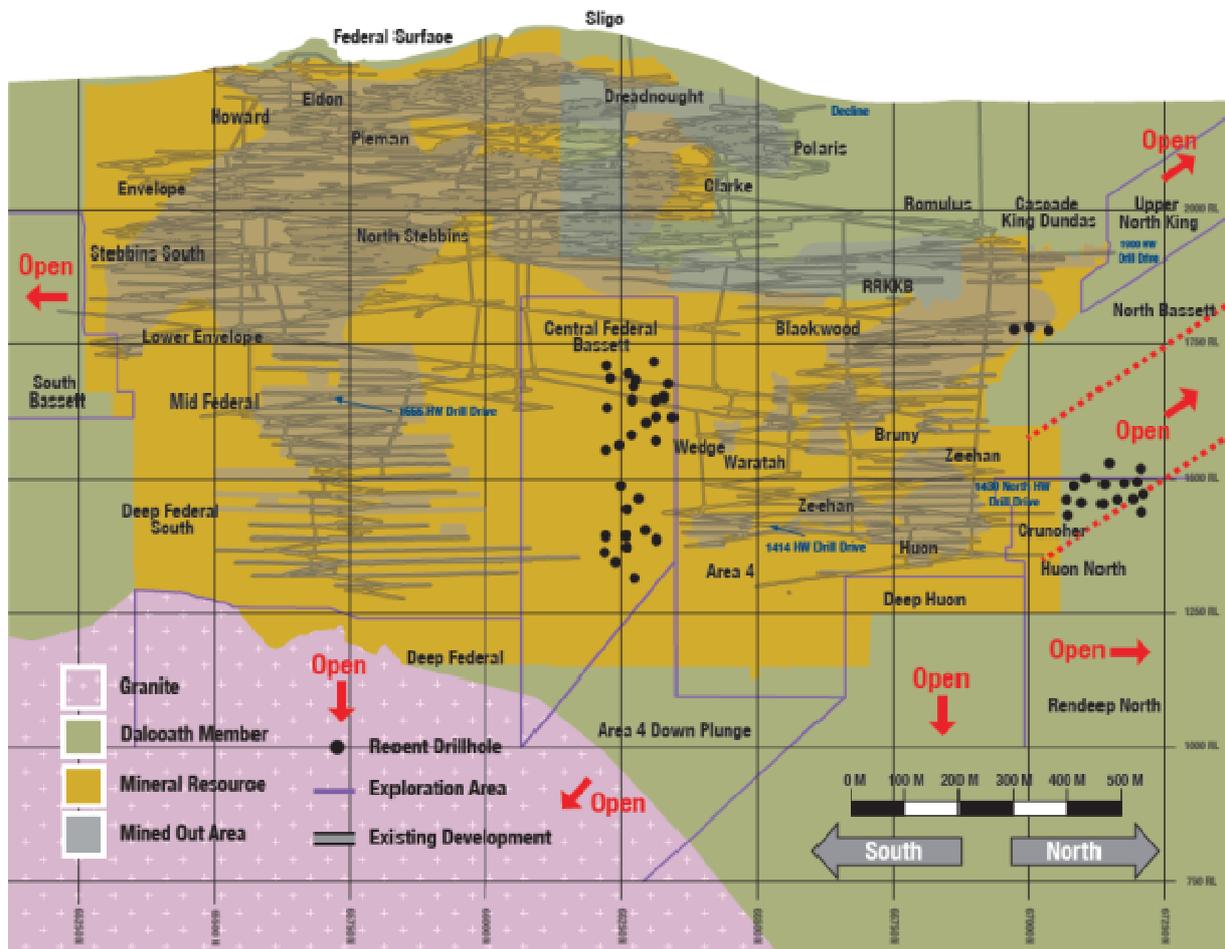
In the 1970s Renison Bell gave its name to the historical conglomerate RGC (Renison Goldfields Consolidated) which once owned and operated mines in Tasmania, Western Australia, Queensland, Northern Territory, Florida, West Virginia, Papua New Guinea and Indonesia.

From the 1980s, production quotas, low tin prices, increased costs and industrial strife led to financial difficulties. Efficiencies were made through mining higher grades of ore and control of the dilution of the ore. In 1996, the \$34 million Rendeep Project was implemented to develop deeper ore reserves,

including an underground crusher and shaft were installed in 1996 to reduce transport costs. RGC sold the Renison Bell Mine to Murchison United NL a Brisbane-based Australian company, in August 1998.

Despite the various efficiency measures made in the previous decade Murchison United was operating the mine during a period of very low tin prices and, in July 2003, went into administration and the mine production ceased.

In April 2004 the mine was purchased by Bluestone Tin Limited. It operated the mine and mill at Renison Bell, under continuing low tin prices, until placing the operation into care and maintenance in September 2005. Bluestone Tin Limited, changed its name to Metals X Limited, recommissioned the mill and mine in 2008 with the first tin produced in August 2008.

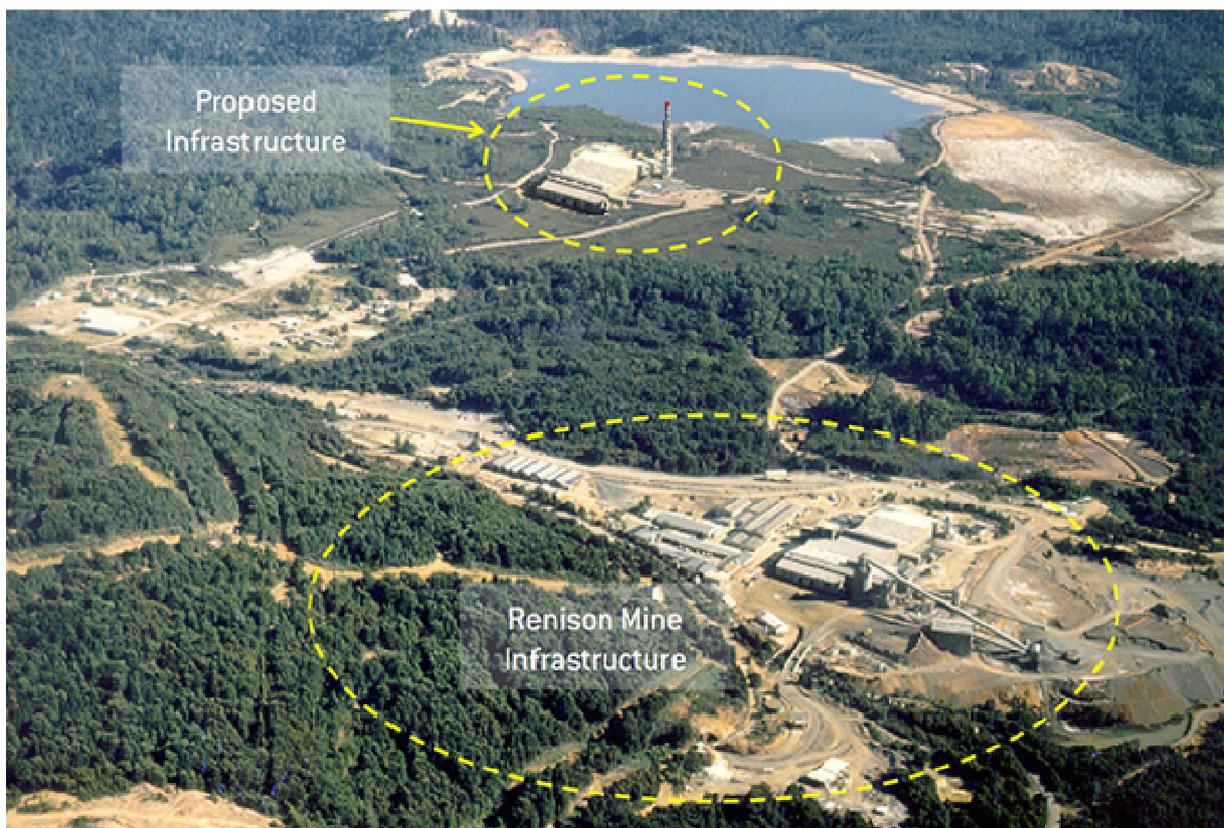


The Renison Bell Deposit is a substantial tin orebody, estimated to contain 26 mn tonnes of 1.46% tin. The mineralisation is associated with Devonian aged granite plutons. The orebody is the largest of three major, stratabound, carbonate replacement, pyrrhotite-cassiterite deposits in western Tasmania. It is located within the Dundas trough, which is a structural domain, underlain by a thick sequence of siliciclastic and volcanoclastic rocks. Three shallowly dipping dolomite horizons located within the sub-

aerial to shallow marine neoproterozoic Success Creek group and the overlying shallow marine early cambrian Crimson Creek formation host the mineralisation.

The current Resource is 245,000 tonnes of tin metal, 78% of which is JORC measured and indicated category. The project is targeting annualised tin production of 7-8,000 tonnes at an operating cash cost of approximately A\$12-13,000/t, comparing favourably with current tin prices.

The current mining reserve estimate is 45,700 tonnes of contained tin with a resource of 153,000 tonnes of contained tin. In 2012, Metals X increased the mining reserve estimate by 23% and the mineral resource estimate by 13%.



The company is pushing for annualised tin production of 7-8,000 tonnes and getting operating cash costs down to approximately AUD\$12-13,000 per tonne, which obviously compares favourably with current tin prices. In the most recent quarter for which results were available (September 2013) the company's tin operations:

- Mined 158,040 tonnes @ 1.55% Sn an increase of 11%
- Tonnes processed increased 4% to 153,181 tonnes @ 1.53% Sn
- Tin metal in concentrates increased by 5% to 1,586 tonnes
- Cash cost of sales were slightly below the previous quarter at AUD\$17,506/t Sn

Cash costs still have a long way to go before meeting the targeted AUD\$12-13,000 per tonne.

The Rentails project aims to re-process and recover tin from an estimated 18.957 million tonnes of tailings that have an average grade of 0.44 per cent tin and 0.21 per cent copper, that remain at the site from the historic processing of tin ores from the Renison Bell mine.

Metals X - Tin Division				
	Mar Qtr 2013	June Qtr 2013	Sept Qtr 2013	Dec Qtr 2013
Revenue	17.64	16.07	18.53	18.92
EBITDA	6.06	2.61	4.67	5.36

Other Interests

Something always has to come along and spoil the party and in the case of Metals X it is the urge for diversification. We hope that the steps it took in 2013 were just an opportunistic flip and then when gold stocks recover this will be a spinout of some sort. The transaction in questions was the purchase, announced in September 2013 and closed in late October 2013, of the Australian assets of Alacer. This is a portfolio which represented the bulk of the Avoca assets which came to Alacer in the merger several years ago of Anatolia Development with Avoca Gold. This “merger of equals” at the time had a \$2bn market cap. Under the agreement Metals X agreed to pay Alacer A\$40 million with a working capital adjustments based on specific current assets and current liabilities, and gold dore at hand as at 30 September 2013.

The assets include the Higginsville Gold Operations, which consists of a 1.35 mn tpa gold plant, the Trident and Chalice underground mines, and various associated plant and infrastructure.

Higginsville had a NI 43-101 Mineral Resource as at 31 December of 15.9 million tonnes at 3.0 g/t Au containing 1.55 million ounces of gold. As it is an operating mine that would have been diminished since that date.

The acquisition also includes the producing asset of the South Kalgoorlie Operations, which consists of a 1.2 mn tpa gold plant, a diverse list of open pit and underground mining opportunities and various associate infrastructures. The NI 43-101 Mineral Resource for this project, as at 31 December 2012 was 87.8 million tonnes at 2.0 g/t Au containing 5.69 million ounces of gold.

Metals X announced at the time that it intended to operate the mines on a going concern basis with no halt to gold production. This was a massive retreat for Alacer. The rationale for the sale was that total cash costs at Higginsville and South Kalgoorlie had risen in recent years. In the quarter ending June 30 they stood at \$1,268 per ounce gold on production of 41,622 ounces gold. That compared to total cash costs at Alacer's Çöpler mine in Turkey at \$395 per ounce (but closer to \$900 on an all-in cost basis) on 68,195 ounces gold of production.

The December quarter results for Metals X show that the Alacer buy was a bargain indeed and casts a lot of questions about the competence of Alacer. In the first quarter of operations, Metals X shrunk the

production at Higginsville from 298K tonnes to 238K tonnes. Tonnes processed did not decline as much (these were 251k as clearly there must have been some stockpiles to work on). Head grade was up from 5.08 g/t to 5.46 g/t, recovery was pretty much the same and gold produced was 42,443 oz versus 47,310 ozs in the last quarter that Alacer operated it. Now the embarrassing part for Alacer is that the total cost of sales under Metals X management was a mere AUD\$903 per oz (which equates to around US\$850 per oz).

At South Kalgoorlie the gold production doubled to 8,844 ozs from the levels of the last quarter Alacer operated that facility. Total cash costs were AUD\$818 per oz, giving an operating margin of over \$500 per oz. Capex spend to achieve this doubling was zero.....

This means that the new owners have stumbled upon a financial gusher which definitively puts tin into the back seat even with the strongest of projections for output or cash costs at Renison.

In the gold space, Metals X already had some interests but neither of those is producing. These are the Central Murchison Gold Project (with a JORC-compliant Total Identified Mineral Resource estimated at 4.95Moz and Probable Reserves of 1.17Moz) and the gold/copper Rover project with a (1.22 mn oz AuEq JORC Resource). Both are under consideration for development. As all these properties are in Western Australia (admittedly a giant space) we cannot say as to whether the company feels there might be synergies in developing the legacy projects now that it has two operating mines with extensive processing capability.

The Nickel Project

The other asset that Metals X holds that predates the Alacer deal is the sizeable Wingellina nickel project. This project is part of the larger regional Central Musgrave Project, one of the largest undeveloped nickeliferous 'pure oxide' limonite accumulations in the world.

The Wingellina Project consists of 187M tonnes of ore at 1% nickel and 0.08% cobalt. Over 167M tonnes or 90% of this resource is classified as Probable Mining Reserve. The mineralogy of the Wingellina ore is a major strength of the project as unlike most Australian nickel laterite projects, Wingellina ore has characteristics suited to High Pressure Acid Leaching, with high iron grades (resource average 47% Fe₂O₃) and a very low concentration of magnesium (resource average 1.6% Mg).

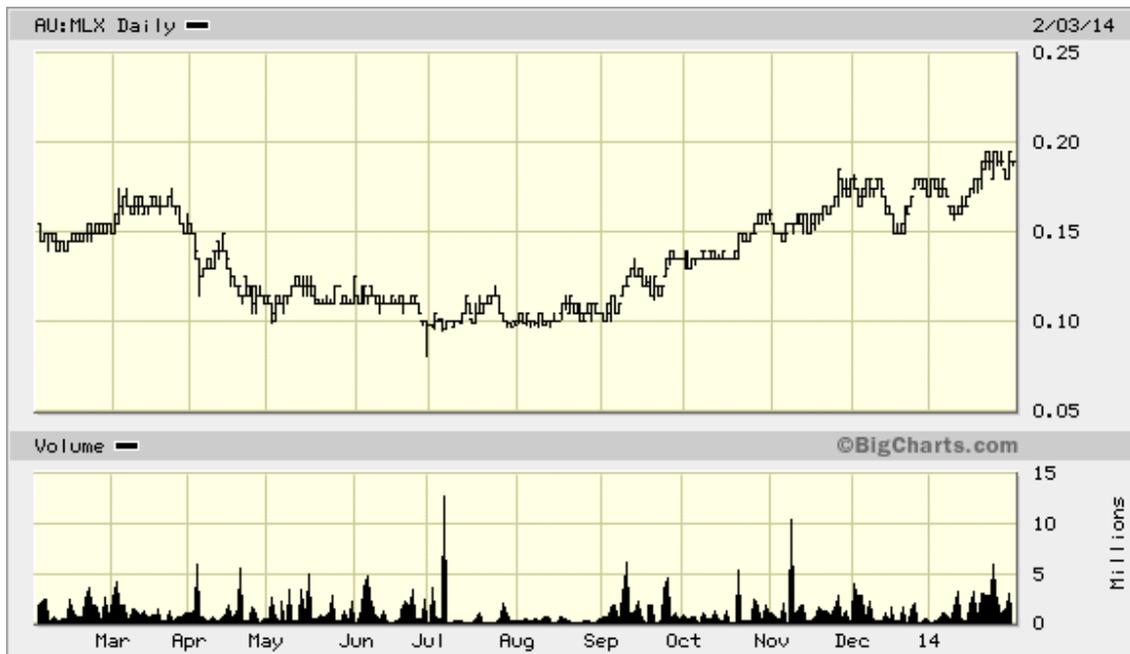
Metals X has completed a Feasibility Study which defined a robust project with a minimum 40 year mine life at an average annual production rate of 40,000 tonnes of nickel and 3,000 tonnes of cobalt. The Feasibility Study assumed a nickel price of US\$20,000 per tonne nickel, US\$40,000 per tonne cobalt and an A\$/US\$ exchange rate of 0.85, resulting in an estimated NPV at 8% of \$3.4 bn at a production cost of US\$3.34/lb after cobalt credits. Samsung are partnering with metals X to prepare a detailed Feasibility Study. The market currently has little appetite for new nickel projects and Australia has a number of mothballed nickel producers at the moment. CapEx and cost overruns have left a bitter taste for backers of de novo nickel mines in recent years so we see this marking time for the moment.

Conclusion

The chief problem we have with Metals X is style drift as they would say in the hedge fund industry.

Nowhere is it written that the company has to devote itself exclusively to one metal but unfortunately the purchase in the second half of last year of Alacer's Australian gold mine may have been a bargain but it definitely muddies the waters for those wanting a pure play in the tin space. Metals X weakened its status as the premier tin play with the Alacer transaction.

Our rating on this stock would be a **Long** if it had not been for the Alacer asset purchase. The nickel was regarded as moot up until that point but the gold has distracted heavily from the tin focus. If the company can enunciate to the market a clear path towards realising value from the gold via a separation (maybe a demerger) then we would be very inclined to give Metals X a "most favoured miner" status in the tin space rating. For the moment as regards it being a tin exposure it must remain with a **Neutral** rating though. However, on fundamental grounds and regarding Metals X as just "any other mining company" it is undoubtedly very attractive and its deal with Alacer was nothing short of daring and brilliant. Hence our target price of 33 cts. So Metals X receives a nuanced (bordering on confused) rating from us but that is what happens when a focus from pure(ish) play to diversified takes place.



European Metals (EGH.ax)

Strategy: Neutral

Key Metrics		2012	2013e	2014e
Price (AUD)	\$ 0.19		n/a	n/a
12-Month Target Price (AUD)	n/a		n/a	n/a
Upside to Target	n/a			
High-low (12 mth)	\$0.13- \$0.62	n/a		
Market Cap (AUD mn)	\$ 15.0			
Shares Outstanding (millions)	2.8			
		Consensus EPS	n/a	n/a
		Hallgarten EPS	n/a	n/a
		Actual EPS	n/a	n/a
		P/E	n/a	n/a

This company is the renamed manifestation of the ASX-listed Equamineral Holdings. The company announced in December 2013 that it had entered into an agreement with European Metals (UK) Limited to acquire the company's tin, tungsten and lithium assets in the Czech Republic. It is currently conducting due diligence on the project and expects to seek shareholder approval to proceed with the acquisition at an EGM to be held late in February. Upon completion of the acquisition, the company will be renamed European Metals Limited.

The main asset is Cinovec, a project which hosts an Inferred Resource of 28.1Mt grading 0.37% Sn, 0.04% W, for total contained tin of 103,970 tonnes based on 83,000m of drilling and 21.5km of underground drives

- Additional Inferred Resource¹ for lithium of 36.8Mt grading 0.8% Li₂O
- Parts of the Cinovec deposit were mined historically, but it remains one of the largest undeveloped hard rock tin projects in the world with proven high metallurgical recoveries

Cinovec is a historic tin mine that incorporates a significant undeveloped tin resource with potential by-product tungsten, lithium, rubidium, scandium, niobium and tantalum. The inferred resource for Cinovec totals 28.1Mt grading 0.37% Sn for 103,970 tonnes of contained tin, which makes it one of the largest undeveloped tin deposits in the world. Cinovec also hosts a partly-overlapping hard rock lithium deposit with a total inferred resource estimate of 36.8Mt @ 0.8% Li₂O. The resource estimates were based on exploration completed by the Czechoslovakian Government in the 1970s and 1980s, including 83,000m of drilling and 21.5km of underground exploration drifting.

According to the company, the deposit appears amenable to bulk mining techniques and has had over 400,000 tonnes trial mined as a sub-level open stope. Historical metallurgical test work, including the processing of the trial mine ore through the previous on-site processing plant, indicates the ore can be treated using simple gravity methods with good recovery rates for tin and tungsten in oxide minerals of approximately 75%. Cinovec is extremely well serviced by infrastructure, with a sealed road adjacent to the deposit, rail lines located 5km north and 8km south of the deposit and an active 22kV transmission line running to the mine.



The other asset coming along with the deal is the Zlatý Kopec polymetallic tin-zinc-indium project. Our interest in the prospects of Indium has been well-signaled in the past.

The company's legacy project is its Oyabi in the Republic of Congo (Congo-Brazzaville). There is little evidence much has been done with this in recent times.

Conclusion

This stock is too formative to yet pass much of an opinion. It is clear that at least they have a past-producing mine and that it is very well located in central Europe. That may yet be a curse as those who have tried to move projects forward in Slovakia have found.

Our rating on this stock is a **Neutral** at this time.



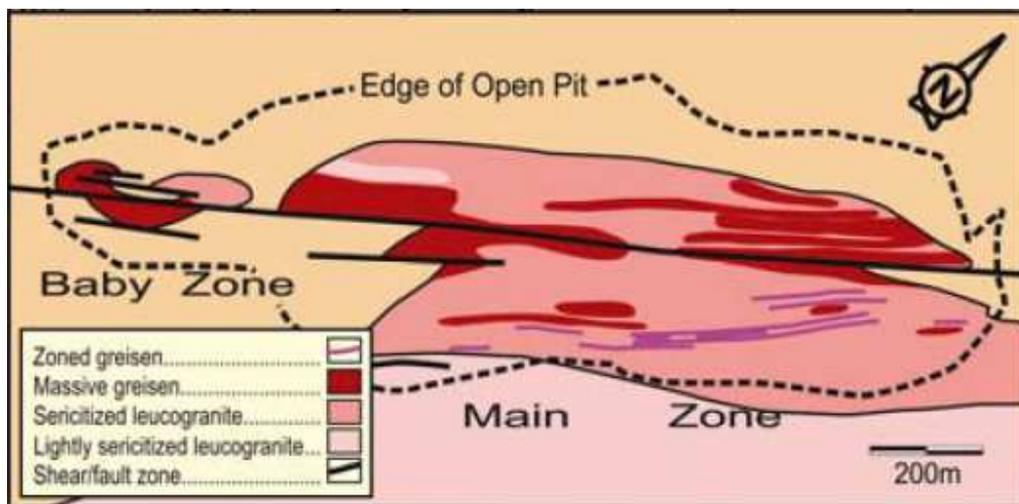
Avalon Rare Metals (AVL.to)

Strategy: Avoid

Key Metrics		(Yr end Aug)	2013	2014e	2015e
Price (CAD)	\$ 0.60	Consensus EPS		(\$0.11)	(\$0.14)
12-Month Target Price (CAD)	\$ 0.40	Hallgarten EPS		(\$0.10)	(\$0.06)
Upside to Target	-33%	Actual EPS	(\$0.11)		
High-low (12 mth)	\$0.48 - \$1.34	P/E	n/a	n/a	n/a
Market Cap (CAD mn)	\$ 65.9				
Shares Outstanding (millions)	109.9				

Back in the days before Rare Earths took off, Avalon was hedging its bets by calling itself “Rare Metals” rather than “Rare Earths” and its property mix reflected this with not only the Thor Lake project but also the Tin/Indium property at East Kemptville in Nova Scotia. This 100% owned project is located approximately 45 km northeast of Yarmouth, in Yarmouth County, southwestern Nova Scotia in the vicinity of the former East Kemptville Tin Mine.

The deposit was discovered in 1979 by Shell Canada Resources Ltd. It was developed as a mine by Rio Algom between 1982 and 1985. The mine was North America’s first and only primary Sn producer, more analogous to sites in Europe, where similar greisen-hosted deposits had been mined for centuries. It was a large low-grade open pit operation producing some 4,000 tpa up to its closure in 1992. The mine had operated for seven years and was also a producer of zinc and copper.



Source: *Economic Geology*, v. 91, p. 368-385

East Kemptville was first thought of as a large (56 Mt of 0.17% Sn) greisenized, quartz-topaz leucogranite. It was initially interpreted as something similar to a large, porphyry-style deposit, with evenly disseminated mineralization. Once mining began, however, it became apparent that there was a strong structural control of the mineralization along northeast-trending shear and fault zones and along

country rock contacts.

Tin (cassiterite), sphalerite and chalcopyrite) at East Kemptville occur in greisens of two main styles. Most notable are zoned greisen veins, ranging from 20-50 cm wide, that consist of a core of massive cassiterite (1-3 cm thick) enveloped by massive topaz. However, most of the tin and base metals in the deposit are contained within 1-10 m wide zones of massive quartz-topaz-sericite-muscovite greisen.

Even though East Kemptville, when producing, was the lowest grade hard rock producer in the global tin industry, the mine and mill performed famously with 75% recoveries, excellent for such a low grade ore. The mine's demise was the result of poor economic circumstances. When mining began in 1985 tin sold for over \$9/lb. but within a month the global tin market had collapsed, Sn dropped to less than \$3/lb. and it remained so until the mine closed in 1992. In the opinion of the provincial mining authority, some 12-15mn tonnes of low grade Sn ore remains there.

The property held by Avalon consists of 10 contiguous exploration licenses and a Special License comprising 15,480 acres (6,264.53 ha) and 880 acres (356.12 ha) respectively. The Special License was granted by the Province of Nova Scotia in August of 2006 over part of the former mine site and since that time, various exploration licenses have been staked to cover potential regional exploration targets identified in the company's compilation efforts.

Avalon was granted the special exploration licence to search and prospect for all minerals except for coal, salt, potash and uranium within 22 claims totalling approximately 880 acres (356.12 ha).

Avalon acquired mineral title to the property in 2005, although Rio Algom (now part of the giant BHP Billiton group) retains surface rights to the property. Avalon has been granted a 12 month extension of its obligation to spend \$1.5 million on exploration and a preliminary economic analysis.

Last official news out of this project was back in 2010 when a planned work program awaited agreement by the Nova Scotia government and BHPB. In 2010 Avalon had spent around \$500,000 on exploration of the Ikes Ridge property which is adjacent to the East Kemptville site. However recently Allnovascotia a 'well regarded' local news website said "...the Yarmouth-based deposit is in limbo as Bubar and Co. continue to negotiate with the province and a nearby property owner for site access. Under its special license Avalon committed to a \$1.5 million spend by September 2014. But it has requested the Nova Scotia Department of Natural Resources extend its deadline to reflect the delay"

Road access is good with Highway #203 which connects the Town of Yarmouth to the southwest with the Town of Shelburne to the east passing a short distance to the northwest of the exploration licences.

Conclusion

What an *opportunity lost* is Avalon. So much money spent to achieve so little. So much of a lead frittered away. And still the company appears like deer in the headlights, unable to cogently justify cultivating a second string to its bow when it should be taking the Nechalacho project out behind the barn for a merciful end.

Frankly tin/indium is about the only thing relating to Avalon that gets our pulse racing. The last news we

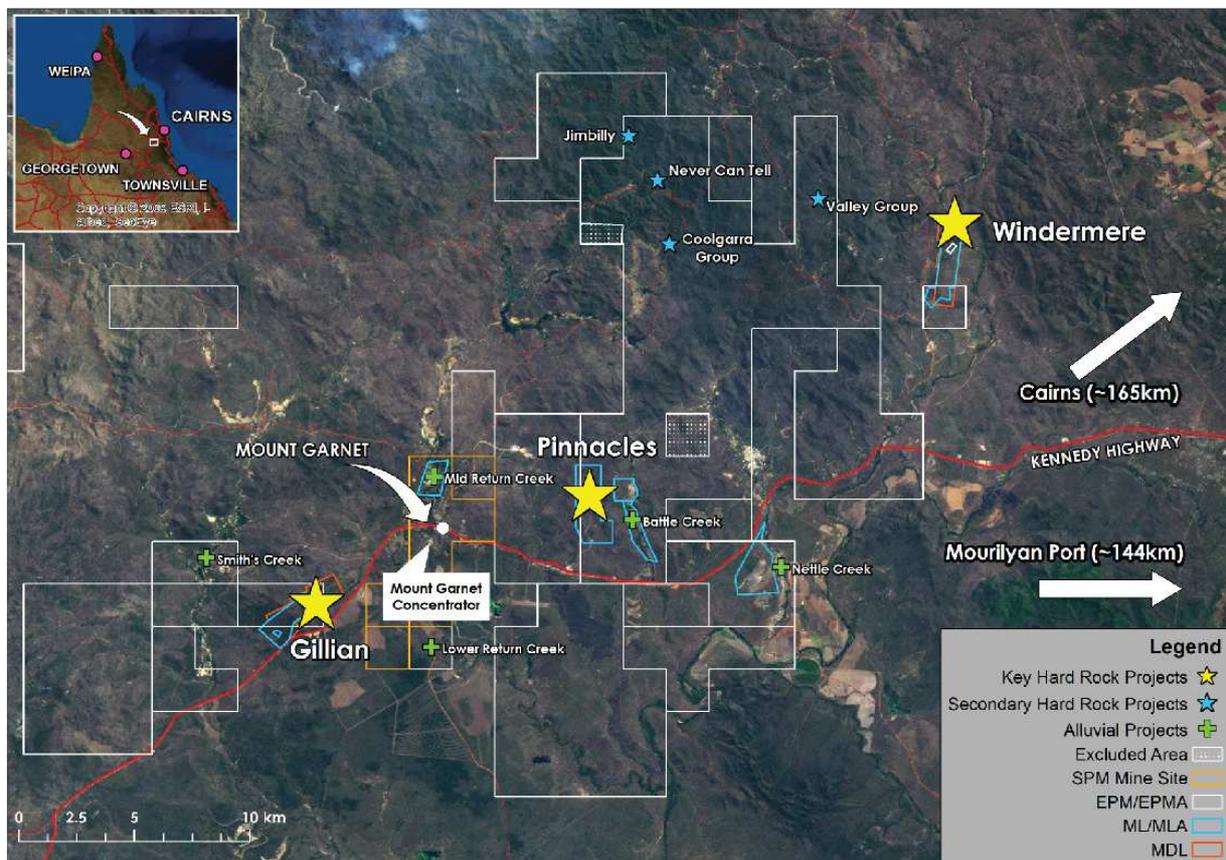
can find was the company's "putting on hold" its PEA plans for East Kemptville (also back in 2010). This is frustrating because Indium is a very interesting topic indeed. We have commented before on how we believe the machinations surrounding South American Silver's Malku Khota property in Bolivia probably relate to a Chinese inspired asset grab in this metal. So we have Avalon pulling its punches on tin/indium while pursuing the chimeric benefits of Rare Earths. When we wrote on the company early in 2013 urging that it switch focus to tin it still had around \$20mn in cash of hand. This is probably very much less now and the focus still has not changed. East Kemptville thus remains an asset to keep an eye upon when the Avalon fire sale begins.

Thus Avalon would be classified as a **Short** if it hadn't fallen as far as it has. Therefore for the moment we shall rate it as an **Avoid**.



case of the Mt Garnet area, the presence of fluorine, as fluorite, suggests fluorine was the complexing element. The reaction of this fluid with marble breaks the complex, with the fluorine joining with calcium to form fluorite. The Gillian skarn is located seven kilometres south west of Mt Garnet. The mineralised outcrop is a 5-10 metres wide outcropping magnetite/haematite of a one kilometre strike length.

The larger deposit in terms of gross tonnage is the Pinnacles Skarn, which is located 10 kilometres east of Mt Garnet. The skarn thickness in the eastern contact at this site varied from 2 metres to 20 metres and grade averaged 0.4% Sn but up to 8 metres @ 2.3% Sn. In the opinion of CSD the tonnage potential of this eastern contact is large. CSD has undertaken drilling on several of the 23 Comalco prospects, and does not believe depth has been closed off. In a further favorable twist (in part compensating for the lowish grades) the shallow depth also means that strip ratios in a potential mining operation would be low.



The Mt Garnet project has a total JORC Mineral Resource of 13.12Mt @ 0.39% Sn (056% Sn equivalent including iron and fluorine by-products), which includes 1.1Mt @ 0.73% Sn in the Measured category at the Gillian deposit.

TIN (Sn)	Cut-off Sn_EQ %	Measured tonnes	Grade Sn%	Indicated tonnes	Grade Sn%	Inferred tonnes	Grade Sn%	Total tonnes	Grade Sn%
Gillian	0.2	1,105,000	0.73	1,563,000	0.62	930,000	0.61	3,599,000	0.65
Pinnacles	0.33	-	-	5,461,000	0.30	1,575,000	0.30	7,035,000	0.30
Deadmans Gully	0.18	-	-	444,000	0.34	-	-	444,000	0.34
Windermere	0.25	-	-	829,000	0.26	1,211,000	0.27	2,040,000	0.27
TOTAL		1,105,000	0.73	8,296,000	0.36	3,716,000	0.37	13,118,000	0.39

The company's objective is to develop the project into a major low cost, open pit mining operation processing one million tonnes per annum to produce approximately 5,000 tonnes of tin in concentrate per annum. The short-term goal is to establish tin production by end 2014 and focus on increasing mine life and production profile by developing other tin production opportunities within the broader Mt Garnet Tin Project area.

The Concentrator at Arm's Length

The coming together of the deposits with the concentrator was the result of the symbiotic relationship between CSD and its largest shareholder, a Hong Kong-based investment group Snow Peak Investment Pty Ltd, which also holds a 18.4% stake in CSD. In turn CSD has a 10% free-carry interest in Snow Peak Mines (SPM.ax) in which the HK group also features as the largest shareholder.

Back in January 2013, Snow Peak announced that it had acquired control of a bundle of assets in the North of Queensland that were being sold by the liquidators of the once-mighty Kagara Mining. These assets comprised the mineral resources and processing plant at Mt Garnet; the Balcooma and Baal Gammon mining areas; and the Einasleigh and Maitland exploration projects. These mining projects and mine areas are largely copper-focussed, however the processing plant is polymetallic. The concentrator is located just nine kilometres by sealed road (the Kennedy Highway) from the Gillian deposit.

Snow Peak paid around \$29mn for this asset package also provided cash backing in the amount of \$10.7 million for environmental bonds in relation to the assets it acquired.

The PFS

In late September 2013 CSD announced the results of its Pre-feasibility Study (PFS) indicating that the project is technically and financially viable, justifying progression to a Definitive Feasibility Study (DFS).

The PFS was modelled on a 1mn tpa open cut mine with the concentrator producing an estimated 2,944 tpa of tin concentrate at 68% Sn and 234,970 tpa of iron (Fe) in concentrate at 65% Fe for export, and 53,860tpa Fluorite @ 86% CaF₂ (Acidspar quality achieved in metallurgical testing) in concentrate.

Another positive outcome of the PFS was the identification of a number of opportunities for financial improvement with further design optimisation of mining and processing stages.

The Windermere/Deadman's Gully deposit was not included in this PFS. Further development of this deposit, and other prospective Company tenements, provides scope for increasing production and extending the mine life of the Mt Garnet Tin Project beyond the PFS indicated mine life of nine years.

The Concentrator Brought Onboard

The transaction took on a new twist late last year when in November 2013, the arrangement was further modified when CSD agreed to acquire the Mt Garnet processing plant (and associated tenements and information) for issue of 285mn shares to Snow Peak. Details of the deal were:

- Shares will be subject to a two-year voluntary escrow period and as such will not trade on ASX for two years
- CSD to receive revenue from toll treatment of Snow Peak Mining ore from projects not being transferred
- CSD maintain percentage of all profit from SPM operations through 9.8% holding in other SPM assets not included
- Mt Garnet concentrator expected to be producing copper concentrate from SPM's remaining projects from Q1 of 2014

To say the transaction is complicated is an understatement. Upon completion of the transaction SPM will hold approximately 70% of the company's shares. However, SPM has agreed to conduct an in specie distribution of the Consideration Shares to its shareholders (other than the Company, which holds 9.8% of SPM). SPM's shareholders have further agreed to a voluntary escrow period in respect of all of the Consideration Shares distributed of 2 years.

Consolidated Tin will also issue 30 million of its fully paid ordinary shares to Snow Peak International Investments Limited (SPII) as repayment of a \$3 million advance payment made to Consolidated Tin as per the Heads of Agreement (SPII Shares).

Upon completion of the transaction SPII holds approximately 55% of CSD's issued capital. This is on the basis that SPII already held approximately 36,400,000 CSD shares (or 16% of CSD), exercised 27.3mn options at 7 cents on the 30th of December 2013, and will acquire approximately an additional 220 million CSD shares upon completion of the in specie distribution (as SPII holds approximately 78% of SPM, excluding CSD's 9.8% interest) and will acquire an additional 30 million CSD shares upon the issue of the SPII Shares. This definitely makes CSD a captive of the Hong Kong company.

Conclusion

When one can hack through the thickets of the transactions to get to the real nub of the tin production story at CSD things starts to look very promising. CSD is in the right place at the right time with a combination of a strong tin price and weaker Australian dollar interacting with the fortuitous availability of a nearby concentrator at liquidation prices to process the output. Thus the planets are aligning for CSD to enter the ranks of tin producers by year-end, while in the short-term gleaning tolling revenue from ownership of the concentrator that will process the output of Snow Peak and others.

These factors make CSD one of the most immediate tin players (not to mention its interesting fluorite component and less gripping iron output). We are rating this stock a **Long** at this time with a 12-month target price of 15 cents and have added a position to the Model Mining Portfolio.



UCore (UCU.v)

Strategy: Long

Key Metrics		(Yr end Dec)	2012	2013e	2014e
Price (CAD)	\$	0.28		n/a	n/a
12-Month Target Price (CAD)	\$	0.70		(\$0.03)	(\$0.03)
Upside to Target		150%			
High-low (12 mth)		\$0.18 - \$0.47			
Market Cap (CAD mn)	\$	48.3			
Shares Outstanding (millions)		172.6			
			Consensus EPS	n/a	n/a
			Hallgarten EPS	(\$0.03)	(\$0.03)
			Actual EPS	(\$0.04)	
			P/E	n/a	n/a

We are long-term believers in UCore's Rare Earth Bokan deposit but were made aware back in 2011 that the company also owned a very interesting tin deposit in mainland Alaska. This asset has its origins in the hunt for further Rare Earth assets in Alaska in the early days of UCore's emergence as a REE player in that state. As we have written elsewhere, some global production of REE (i.e. that in Malaysia) is a by-product of tin mining, most specifically cassiterite. UCore's team includes veteran geos with a broad knowledge of the state's historic metal resources and they advised inclusion of the Ray River deposits in the project portfolio.

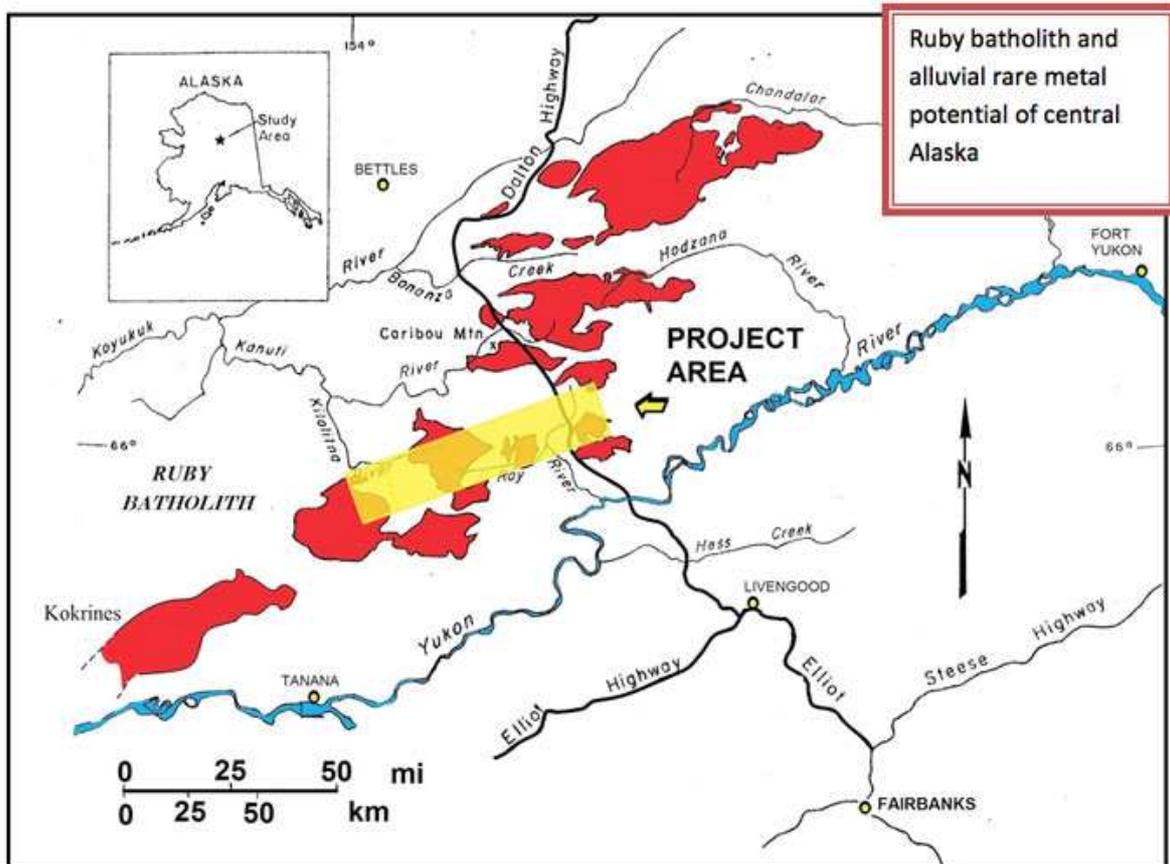
The definitive work on the deposits, INVESTIGATION OF TIN-RARE EARTH ELEMENT PLACERS IN THE RAY RIVER WATERSHED was written by UCore's current consultant James C. Barker, when he was working for the Bureau of Land Management. Thus is scarcely any surprise that UCU got first dibs on these promising assets. With finite resources UCore naturally has focused on moving Bokan forward while keeping Ray River in reserve as a follow-up project. However with tin having held up so strongly in recent years, the company has come to consider that there may be potential to monetize the tin potential of the deposit over the REE aspect in the short-term.

The Ray Mountains region of central Alaska features an extensive sheet of alluvial sediments in some places 100 m thick. These alluvial deposits contain widespread concentrations of tin (Sn), tungsten (W), REE, Zircon (Zr), Niobium (Nb) and Tantalum (Ta) minerals. The minerals are primarily derived from granitic source rock of the Ruby Batholith, and they are most abundant in the lower elevation terrain between the Ray Mountains and the northern Fort Hamlin Hills.

It is useful to note the way in which this deposit evolved geologically. In the first instance basalt flows blocked local drainages, and 50-to 100-ft of terrace gravel was eventually deposited on top of the flows. Further downwarping and eventual fluvial downcutting of the flows resulted in cycles of accelerated sediment transport, deposition, and reconcentration. Repeated erosional cycles concentrated heavy minerals and resulted in development of tin placers.

Work by the BLM on the Ft. Hamlin Hills-Ray River project was conducted intermittently from 1975 to 1989. Resource estimates of contained tin in recent alluvium ranged from 62mn to as much as 172mn lbs of Sn in 300 million cubic yards. The grade of about 90% of the gravels was estimated to range between 0.2 lbs to 0.5 lbs of Sn per cubic yard. These estimates were projected on the basis of surface sampling and seven auger drill holes and are provided for the purpose of land-use management

planning.



Source: UCore

UCore, through a wholly owned operating subsidiary, holds claims on land selected for its mineral resource potential by the State of Alaska as part of the state's land entitlement under the 1958 Alaska Statehood Act.

Sample results from investigations point to potential economic grade concentrations in at least three drainage basins: the upper Kilolitna River, the Ray River, and No Name Creek. Each of these exhibits numerous surface exposures of alluvial gravel and sand containing a threshold of at least 0.15 kg/cubic meter (0.22 lbs/cubic yard) of REE and/or Sn, along with by-product concentrations of tungsten (W), zirconium (Zr), niobium (Nb), and tantalum (Ta). Locally samples contain up to 1 kg/m³ each of Sn and REE in the extensive floodplain of the Ray River. Mineralized sediments from No Name Creek and the Caribou Heights prospects contain up to 9 kg Sn/m³.

The sampling program rendered heavy mineral concentrates composed primarily of ilmenite with cassiterite, monazite with lesser xenotime, zircon, wolframite (ferberite end-member), and trace amounts of allanite, scheelite, and yttrifluorite. The concentrates contained up to 50% Sn, up to 10% total REE (TREE), and 0.01 to 1.0% W, Ta, and Nb. Heavy rare earth elements (HREE's), including Tb, Dy, Er and Y, compose 15% to 25% of the TREE in the majority of samples, with the notable exception of

localized areas such as No Name Creek valley, which delivered TREE content comprised of up to 60% HREE's.

Samples collected during the 2011 field program were concentrated on a standard shaking table. This procedure achieved an estimated 75% to 80% recovery of heavy minerals including REE-bearing minerals such as monazite and xenotime, thus demonstrating amenability to physical separation in a full scale mine plant. This simple gravity separation method uses only water as the separation medium. Further, extraction technology of REE from a monazite-xenotime placer concentrate is already well known and does not present new metallurgical challenges. The smaller samples were panned by experienced personnel.

The potential would appear to exist to exploit these alluvial deposits utilizing dredging. The BLM report, authored by Barker noted that the estimated average grade was 0.2-to 0.5-lbs-Sn/yd³ for the Ray River gravels. Tin dredges commonly work ground containing 0.3-to 0.4- lbs-Sn/yd³. Malaysian tin dredges have successfully operated in ground containing as little as 0.18 lbs Sn/yd³.

The Ray Mountain area is accessed by the partly sealed Dalton Highway from Fairbanks. The road is heavily trucked in both winter and summer (and indeed featured in various episodes of the program, Ice Road Truckers). There is a barge service that is seasonally available along the Yukon River connecting directly to the Alaska Railroad freight yard at Nenana.

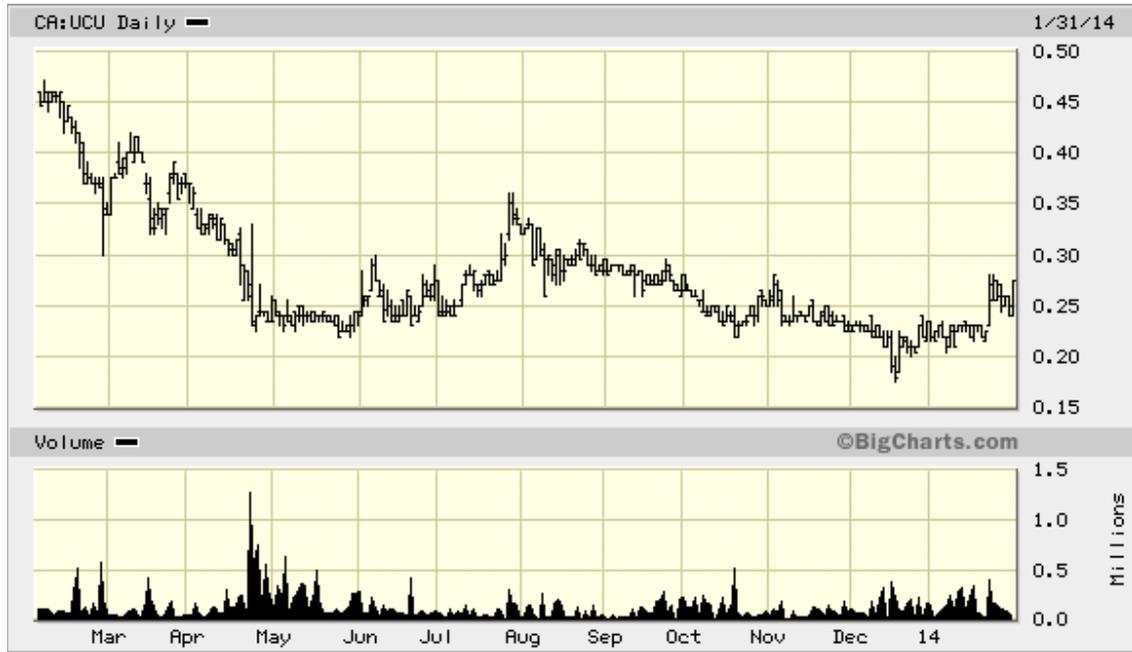
Conclusion

UCore is better known for its REE attributes than its tin prospects. Indeed, very few besides the company and ourselves know about the Ray River asset. It is often that we hear the comment that "Such-and such company receives little value for its X deposit" which is sometimes open to debate but in the case of UCore it is certain that the company gets no credit for Ray River, even if investors believed it to be a REE deposit if only for the reason that the asset has been kept away from the public glare to minimize the distraction of having multiple projects. Bokan Mountain rightly dominates the public perception of UCore.

This is not to diminish Ray River. Indeed this asset if put in a standalone form would make one of the most interesting tin prospects in North America with the added advantage of a very favorable jurisdiction and the ease (and low cost) of establishing alluvial mining in the tin production space. We might also note that Alaska has a long history of alluvial mining so the activity is not groundbreaking and to this is added the superlative relations that the company has not only at the state level but also in the US Senate.

To put this in perspective the activation of tin mining at Ray River would provide the only source of tin supply (besides recycling) on US territory and that would mesh well with the work that UCore has done in Washington in cultivating interest in securing production of strategic metals for the long term security of the US supplies of these products. While this has been mainly in Rare Earths, it is clear that tin is also subject to Chinese dominance and the capriciousness of supply from places such as Indonesia and Bolivia. This should be a hot button issue in Washington as tin has greater economic importance than Rare Earths.

Our rating on UCcore has been a **Long** for several years now and we have seen no reason to alter this. If anything the prospect of monetization of the attractive tin assets represents extra icing on the cake.



Stellar Resources (SRZ.ax)

Strategy: Neutral

Key Metrics		(Yr end June)	2013	2014e	2015e
Price (AUD)	\$	0.05		n/a	n/a
12-Month Target Price (AUD)	\$	0.20		(\$0.009)	(\$0.01)
Upside to Target		300%			
High-low (12 mth)		\$0.04- \$0.07	\$0.001		
Market Cap (AUD mn)	\$	13.7		n/a	n/a
Shares Outstanding (millions)		273.4			
			P/E		
			50.0		

Stellar's main asset is the 100%-owned Heemskirk Tin Project is located near the historic mining town of Zeehan on Tasmania's West Coast and comprises three closely spaced tin deposits, Queen Hill, Severn and Montana. The area is well serviced by power, water, transport, mining and other infrastructure. It also holds some other tin assets in the vicinity that could be factored in later as a source of feed after the main mine goes into decline.

The history of this deposit in recent decades is that there was drilling by Gippsland Limited in the 1970s and subsequently by Aberfoyle Limited during the 1980s which identified three tin deposits; Queen Hill, Montana and Severn. Stellar obtained a 60% interest in the project by joint venturing with Gippsland Limited and eventually moved to 100% control in 2012.

In 2010, while working within the JV, Stellar added to the substantial drilling database with six holes into the near surface Queen Hill deposit. The Stellar results confirmed the high grade nature of the mineralisation and provided fresh samples for metallurgical testing. A scoping study was published in July 2011. Tests indicated that tin was recoverable using a process similar to that employed at the nearby Renison Bell tin mine.

Tin mineralisation at Heemskirk occurs as cassiterite within a broader zone of iron sulphide (pyrrhotite and pyrite) mineralisation. The vein, stock-work and replacements styles of mineralisation most closely resemble that of Renison Bell, the tin mine controlled by Metals X, which is located 18 kilometres to the northeast in a similar geological setting to Heemskirk.



The most recent Mineral Resource estimate for Heemskirk came in at 6.28 million tonnes at 1.14% tin and was published in February 2013 and represents a 49% increase to 71,500 tonnes of contained tin on the previous estimate from October 2011.

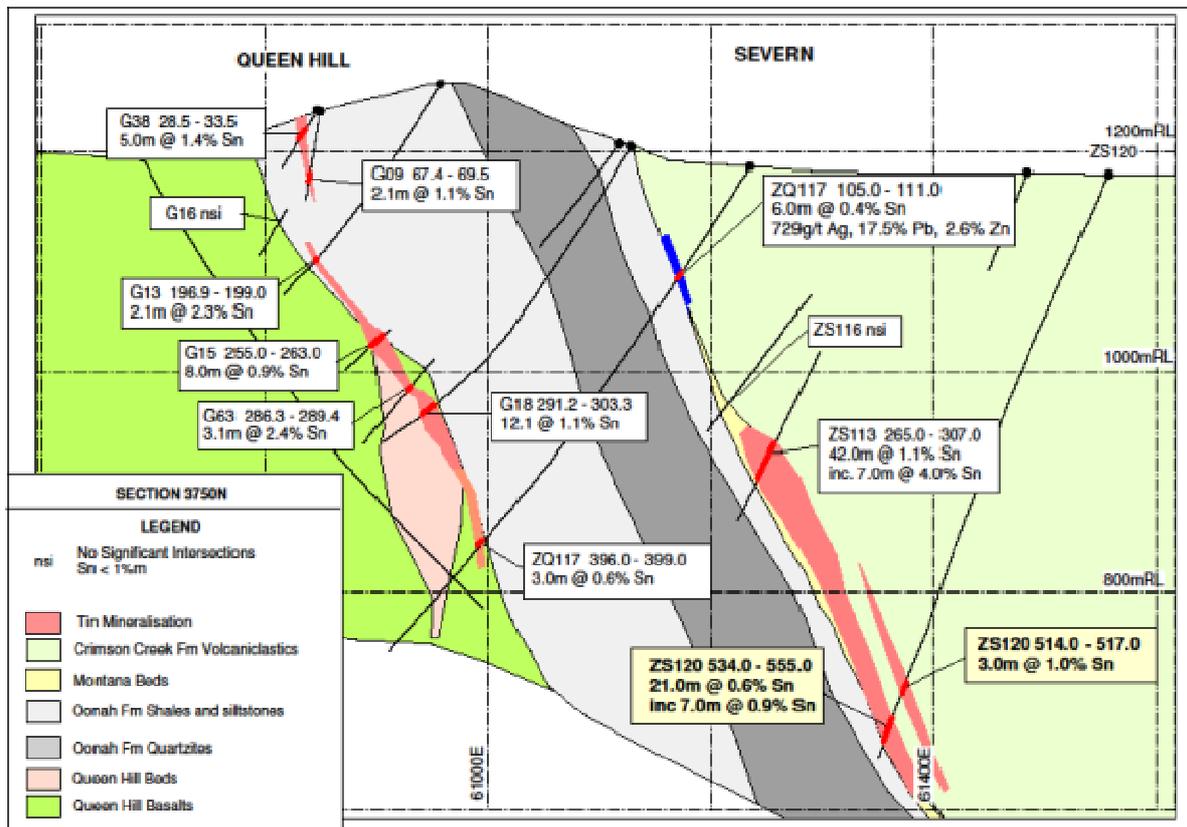
Classification	Deposit	Tonnes millions	Grade % tin	Contained Tin tonnes
Indicated	All	1.41	1.26	17,790
Inferred	All	4.87	1.10	53,710
Total		6.28	1.14	71,500
Indicated	Queen Hill	1.41	1.26	17,790
Inferred	Queen Hill	0.19	1.63	3,090
	Severn	4.17	0.98	40,900
	Montana	0.51	1.91	9,710
Total		6.28	1.14	71,500

0.6% tin block cut-off grade

Tonnes rounded to reflect uncertainty of estimate

Estimates prepared by Resource and Exploration Geology

The cross section below shows the profile of the mineralisation at Queen Hill and Severn.



In July 2013, Stellar completed a prefeasibility study (PFS) based on the upgraded Mineral Resource. The study demonstrated technical and economic feasibility of an underground mine producing 600,000 tonnes of ore a year for the recovery of 4,327 tonnes of tin in concentrate in a standalone processing plant. Key production metrics used in the PFS were:

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- Mining inventory of 3.95mn tonnes
- Mined ore tin grade of 1.06% Sn
- Average Mill Throughput of 600,000 tpa
- Initial mine life of 6.75 years
- Tin recovery of 70%
- Average concentrate grade of 48%
- Average tin in concentrate production of 4,327 tpa
- Mine gate costs of US\$14,329 per tonne of Sn in concentrate

In a tin price scenario utilizing a price of US\$22,950 per tonne and a discount rate of 8%, the NPV comes out at AUD\$11mn with an IRR of 10%. This would represent a payback in 4.7 years. The operating margin per tonne of ore treated was estimated at AUD\$51 producing a total cash surplus of AUD\$77mn. The rather feeble NPV at the above mentioned tin price compares unfavorably with their base case scenario of US\$25,500, where the NPV works out to \$61mn and a total cash surplus of \$152mn.

The pre-production capital cost estimate of US\$114 million includes US\$34 million for mine development, US\$68 million for a processing plant and US\$12 million for a tailings dam and contingency.

The Heemskirk project is also expected to have direct cash production costs of US\$14,438 per tonne of tin in concentrate which places it in a competitive position on the global tin industry mine production cost curve as defined by the International Tin Research Institute.

Recent Financing

Any fund raising these days is welcome and Stellar managed to snag itself a strategic investor in the form of Capetown S.A, a private family-owned company based in Luxembourg. The owner of Capetown S.A. has a long association with the tin industry having spent the last 40 years developing the Metallum Group, a global non-ferrous metal recycling business. Metallum is a holding company founded in 2007, with headquarters in Luxembourg, the subsidiaries of which primarily recycle and process non-ferrous metals. Metallum Holding SA was created out of a merger of the DI Group (headquartered in Regensdorf, Switzerland and founded by the Dietiker family in 1948) and the Metallo Group (founded in 1919 and headquartered in Beerse, Belgium). In July 2013, TowerBrook Capital Partners L.P. (a London/NY private equity group) made a majority investment in Metallum Holding.

Metallum is active worldwide and is divided into the two sectors foundries/smelters and trade/recycling. It recycles, processes and sells about 1,000,000 tonnes of metals annually. Of these, approximately 60% fall in the copper sector, 20% in the aluminium sector and 20% are iron and other metals. In Europe Metallum is the market leader in the non-ferrous metals sector and employs approximately 1,000 people.

However, it would appear that Capetown is owned by the former owners of Metallo. In mid-January 2014, Stellar announced the raising of \$2.6 million (before costs) through the placement of 50mn fully paid ordinary shares at an issue price of \$0.052 cents per share.

Under the terms of the placing agreement, Stellar Resources Limited has, subject to shareholder approval, also agreed to issue to Capetown S.A, 25mn unlisted options at an exercise price of \$0.08

cents, exercisable within a period of three years from the date of issue. It also gave Capetown S.A the right to appoint one director to the Stellar board.

While not a lot of money in the scheme of things, the financing is a useful boost to the cash pile. The previous largest shareholder was Susanne Bunnenberg (a German investor prominent in the mining space) who had acquired an 18.4% stake from Stellar's former JV partner, Gippsland Ltd, in May 2013. After her in the rankings came the well-known Resource Capital Funds with 16.2%. Both of those will now have been diluted down by the Capetown deal.

Conclusion

As the Metals X production story shows, it is not that difficult to make substantial profits (margin-wise) on mining tin underground in the extremely favorable tin pricing environment that prevails at the current time. If tin were to return to \$30,000 per tonne then there would be literally a deluge of good fortune for those companies that make it into production while this situation prevails. Stellar has a promising looking deposit and now a veteran metals market player as a major shareholder. Capex is not too daunting and the company has satellite deposits to beef up mine life (or more correctly put, processing complex life) as exploration adds reserves.

We are leaving Stellar as a **Neutral** rating for now but would rapidly upgrade that should some signs of an offtake agreement enabling a start on construction be inked.



Conclusion

Opinions on the state of the tin market are more consistent than in any other metal that we know of. Even without the Indonesian action, everyone agreed the tin supply situation was sailing into a crisis, the type of crisis that is usually good for producers. Unfortunately there are either too few producers to share this potentially good fortune and/or even fewer available in easily accessible equity markets. The ASX has a few, the TSX has scarcely any.

Tin prices have been on the rise for a few years now so theoretically market forces should have lured some new players into the metal, however the better days (as in metals like Antimony) have also coincided with generally dire mining financing markets and the blowback from the excesses of the Rare Earth boom. Specialty metals, no matter how robust their virtues, have found it tough to attract promoters prepared to set up vehicles for specific metals and then finance them. Additionally the vast bulk of geos seem to have mainly precious and base metal experience, with those interested in the most challenging metals having headed to academia during the lean years. This was demonstrated amply in the REE boom where the number of really skilled geos would fit in a phone booth, the rest were frantically searching Wikipedia to bone up on the subject. That is not to say tin doesn't have geos, for production has been ongoing in South East Asia and Bolivia but they tend to have home patch focus. A student from a North American mining school coming up to graduation in 2008 saying they wanted to pursue a career in tin would have found themselves regarded as mad.

So the problem is in many ways more one of promotion. Large-scale tin deposits exist in familiar and non-exotic mining locales such as those held by Avalon and UCore and the long history of exploiting tin in Australia. The latter nation has had tin miners come and go but there have almost always been some in existence. The feast or famine in North America has not been conducive to creating listed vehicles to pursue tin opportunities even if there were competent QPs to assess the projects being promoted.

Whether vehicles exist or not, the tin price outlook for the next decade is most promising while the production profile is looking decidedly weak. The financing market remains unconducive for the proliferation of new tin stories, which in many ways is good news for those already in existence as there will be less "interference to run" on the path to production.

The danger to avoid now is a situation like that which has evolved at Metals X where a temptation to diversify risk by channeling tin profits into a gold business has essentially left the tin activity as a sideline. Any prospect of Metals X building a tin major from consolidation seems to have gone out of the window. That just leaves a plethora of juniors to be picked off by the Chinese. However this is not necessarily a bad scenario for portfolio investors if they pick the right "victim" at the best (i.e. lowest) price point.

Important disclosures

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