

# Tasman CEO on the nepheline advantage from the Norra Karr heavy rare earth project

December 29, 2015 – In a special InvestorIntel interview, Publisher Tracy Weslosky interviews Mark Saxon of Tasman Metals Ltd. (TSXV: TSM | NYSE MKT: TAS) about the recent completion of a magnetic separation pilot plant for the Norra Karr heavy rare earth project. Mark explains that what they found in the course of their results was a way to commercialize the nepheline by-product. “The work we’re doing now is to get the nepheline into markets so we can understand the value...” and continues “the aim there to have a very low-waste mine or even a zero waste mine if possible.”

**Tracy Weslosky:** Mark you just recently put out some news about the completion of a magnetic separation plant for the Norra Karr heavy rare earth element project. Can you tell us about this news?

**Mark Saxon:** Yes, thanks Tracy. We just finished making a separation pilot plant. That was to do a scale up test of our beneficiation process, which for Norra Karr is mainly separation. That was a test run in Finland. It was paid for by the European Commission under our EURARE project. It performed very well. We’re very pleased with the results.

**Tracy Weslosky:** In addition to that there was something that I thought was very interesting in your news release. It said you’ve managed to take what was previously deemed waste product, nepheline by-product, and you found a way to commercialize this. Could you start by explaining to us at InvestorIntel and maybe the rest of our audience an understanding of what you have here? This sounds exciting.



# Prefeasibility Study and the REE-Awakening of the Rare Earth Market

March 24, 2015 – Mark Saxon, President, CEO and Director of Tasman Metals Ltd. (NYSE MKT: TAS | TSXV: TSM) in an interview with Tracy Weslosky, Publisher for **InvestorIntel** speaks about their recent +77% stock movement in February and their recent filing of NI 43-101 Technical Report on Pre-Feasibility Study for the *Norra Kärr* heavy rare earth element project in Sweden.

**Tracy Weslosky:** It has been. It's nice to have you in-house. Why don't we just kick off this discussion by saying congratulations – you're stock price was up +77% (NYSE MKT: TAS) and +68% (TSXV: TSM) last month.

**Mark Saxon:** Yes. Certainly it's been a very strong February. It's nice to have a month like that behind us I suppose. The rare earth sector hasn't seen really strong trading like that for a very long time.

**Tracy Weslosky:** Well, you know, what's interesting to me is it seems to be the rare earth and critical materials right across the board. You have tungsten as well, which is technically a critical material.

**Mark Saxon:** I guess. We've seen the markets reawaken. Perhaps it's the New Year and perhaps it's the start of a new cycle. I'm not sure which one, but certainly for our stock in particular the stock was up on very strong volume, which obviously all goes well for the next few months.

**Tracy Weslosky:** For all of the InvestorIntel audience that's currently watching the news out of China, of course, there's a

huge demand or the prices have definitely been rising aggressively in both terbium and dysprosium, yes?

**Mark Saxon:** Yes, certainly they have. I guess the news from China is very positive for those metals and it's about time. The prices have been falling for a while and then stabilizing and so we've now seen some lift in the prices. Certainly Tasman has a good opportunity to be a large supplier of both those metals.

**Tracy Weslosky:** Tasman, of course, has got two of the largest projects in heavy rare earths in the world and you just put out your prefeasibility study. Can you please give us an update?

**Mark Saxon:** So we just published the prefeasibility study Tracy for our *Norra Kärr* project, which is Tasman's flagship. Obviously, as I think we've said, it's in Sweden. It's got great infrastructure, a very large deposit and we have done the prefeasibility on a 20-year mine life, although it's very much larger than that. I guess the key thing, you know, in the prefeasibility we're focused on having a very simple processing flow sheet. The technology and the chemicals that are required are very simple, are used widely in Sweden today. Much of the technology we're using is Scandinavian and so very, very simple and not dependent on any new and untested technologies. That means there's a very high level of trust in the process. The financials are good. The rate of return is 20% after tax. The capex is \$375 million. It's very cheap on the current market and certainly that's one of the lowest capex's for a major dysprosium producing project...to access the rest of this interview, [click here](#)

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# InvestorIntelReport: Precious Metals Surge ... with a Uranium Chaser

☒ Those who had expected the Greek election results to make bigger waves were disappointed when that tsunami's wave failed to travel very far and faded away as an impetus for global markets after a few days. It doesn't mean it's gone as an influence but like Ebola seems to be a contagion that is now geographically constrained. The week ended with the new government pretty much saying it didn't care what the Germans wanted *vis a vis* austerity so a showdown is on the cards.

Meanwhile with the Swiss revaluation fading in investor's memories and without a Greek drama, the gold and silver prices both started to give back ground and understandably so... they had moved too far and too fast on not enough solid footing. Oil continued in a weak mode and base metals investors (or bargain buyers.. not clear which) finally cottoned on that low oil is good for base metal prospects. While these didn't exactly jump, they stopped falling and started to firm..the star was uranium which had a good week (relatively speaking).

Currencies are the thing to watch... and I don't mean the Euro. The collapse (no other word for it) of the Canadian and Australian dollars has brought quite a number of benefits for domestic miners in those countries with the oil price decline being icing on the cake in the cost-saving department. With the recent gold/silver price strengthening it's a triple benefit for those mining those metals. I suspect the upturn in the commodity currencies shall start soon and that will probably not be welcome amongst Central Banks that would

prefer a long period of lower currencies to help boost domestic economic activity. However they go to low and they start importing inflation (though not in energy prices...*phew*). Then interest rates have to go up, which crimps growth, but attracts speculators back into the currencies. With both currencies at around 77-78cts to the USD, defensive action must be nearing.

The stellar performance of the month (excuse the bad pun) was Star Minerals, which we expounded upon here last week in an article. It is the up and coming mine-to-market Manganese battery story run by the team that built up Great Western last decade. Star's up-move was a startling 50%. In the absence of news we are tempted to ascribe this move to our analysis. However looking at the moves for the broader universe it seemed to be a week of extremes with only a few stocks making small moves and a lot making sizeable jumps, both up or down. Alkane was unchanged for the week but that concealed the fact that it had been a good performer for the month up 18% during January.

Sentiments in the Rare Earth space were all over the place with Rare Element Resources and Tasman both down over 10% and Ucore up by 13% in the last week of the month. There was no specific news to prompt either to go down and indeed Ucore had some promising drill results confirming its deposit to be open at depth. Graphite had a weak patch with Zenyatta giving back 10.7% to end the month unchanged from where it began 2015. It was not alone though as the whole graphite sub-space was off the boil.

One of the more inexplicable moves for the month was Largo's drop of 30% (down 6.25% in the final week). An operational update during the month showed production was doing well so this down-move looks like it comes from residual bad sentiment towards the steel sector for which Largo's Vanadium output is an important component in alloys. We would note though that the decline in Vanadium prices over the last twelve months has

been relatively small compared to the brutal decline in iron ore prices.

One of the very strongest movers was Carlisle Goldfields which rose by 43% over the month DESPITE having a stock rollback which some minority shareholders had griped about. It seems management was right and the complainers were wrong. The other gold play on our watchlist, Chesapeake Gold, added 16% during January. In silver plays, Levon Resources also had a good month, rising by 13.4%.

We suspect the price declines say less about the stocks that were hit during the month and rather more about the dramatic shift in investor focus to the long becalmed precious metals space where gold's move during the month put every other mining sub-space in the shade.

**Note from the Publisher:** Daniel Carlson's ongoing commentary, or should I say walk-on as an interim editor on The Calandra Report last week seemed to make a difference, with \$AMSE up +37.80%, and of course, one of my favorite InvestorIntel weekly column's – Clausi's Takeover Targets, made a difference in GTA Resources, as identified takeover target \$GTA was up +22.22% for the week. On the graphite sector, I noted a sizable increase in interest again for clients, and 2 led the week: Alabama Graphite Corp.'s \$ABGPF +18.45% & ALP +13.33% and Graphite One Resources Inc. \$GPH up +13.33%. Not to be left in the dust, let's credit lithium play Neometals \$NMT up +18.18% for the week...more being emailed to InvestorIntelReport members this morning...

If you want more, including market sector numbers and the Top 15 most read articles of the week, log-in to InvestorIntelReport or the full copy should be in your inbox within the next hour or so. If you're not a member? Click here to become one.

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# The European Holy Grail for Rare Earths: Tasman Metals

✘ Tasman Metals Ltd. (TSXV: TSM | NYSE MKT: TAS) is a Canadian company for jurisdictional and thereby regulatory purposes that just announced their Pre-Feasibility Study for the Norra Karr heavy rare earth element project in Sweden. Its rare earths' deposit under development is in Sweden and the CAPEX now and OPEX in the future will therefore be payable in Swedish Crowns. The downstream operations of Tasman will be done by European Union companies that must be paid in the common currency of those companies, Euros, and the target European Union customers of Tasman will pay their invoices from Tasman in Euros. The Swedish crown is the currency of a stable prosperous but very small nation; the Euro is the common currency of an assemblage of the world's 2d or 3rd largest economy (in aggregate) but this region is in stagnation so its currency is weakening rapidly against the US dollar, which is in recovery. Tasman is traded in NYC, so that Americans can directly buy shares in this company and those shares are a way for small investors to "play" the currency market now and for the foreseeable future.

In the Great Gatsby, F. Scott Fitzgerald famously has a character ask "Why are the rich different from the [rest of] us?" Fitzgerald puts contemporary America's answer to that question in the response, "Because they have more money."

"Why is Tasman different from all other rare earth juniors?" frustrated investors ask. "Because it is a European deposit," is my American answer.

Tasman's target market is Europe; its hydrometallurgy has been

developed by a Norwegian group; its plan for a separation regime is to use an existing French European toll provider and then move if it becomes economical and possible to an in-house process to-be-devised-and-proven-at-scale in an undisclosed to this author European located, owned, and operated laboratory; and in the first instance to sell the clean mixed concentrate provided to it by the French toll contractor to any of several European rare earth metals/alloys makers that will supply any of several European rare earth permanent magnet alloys makers, the customers of which are European end-use component providers to Europe's, the world's oldest, electrical, automotive, lighting, and industrial machinery manufacturers situated variously in Germany, France, Belgium, Austria, Holland, the UK, Poland, and Romania. Mark my words: European high tech manufacturers must have a profitable Tasman in operation in order to be competitive in products depending on dysprosium, ytterbium, or yttrium. That short list is an extremely deep one. China's Yuan is strengthening also against the Euro, and this only makes China less competitive in Europe with products made in China.

Pay attention to the Swiss Central Bank; it is protecting its national economy (its only reason for existence is this protection) by purposefully "correcting" the value of the Swiss Franc to the Euro. The spill-over from this action is what you need to understand. A sharp increase in the value of Tasman Metals is just one of those consequences, but it is the consequence of which I am writing today.

Europe has one or more longstanding companies able to provide each of the downstream services in a total rare earth supply chain. Europe even had the world's first rare earths mine(s) in Sweden in the nineteenth century. Tasman's deposit would be both the anchor of a European total rare earths supply chain but it would also complete such a chain.

Europe's main competitor is China just as is America's. The difference is that European businessmen did not succumb to

globalization as whole-heartedly as did American businessmen. Also, and this is key, both European manufacturing and also its rare earth supply chain companies consider American and Japanese companies to be competitors not allies! The Europeans therefore do not share their hopes, aspirations, or detailed future product and marketing plans with American or Japanese companies. The famed "alliances" of rare earth end-using manufacturing companies in Germany are in reality fact-finding organizations that do more industrial espionage upon each other than intelligence gathering for mutual benefit.

Yet pundits blithely talk about "global supply" and "global demand" as if they are inextricable intertwined, and, as if the numbers gathered by the various data miners were anything other than educated guesses based on very biased sampling.

To repeat for emphasis: Tasman Metals is a company with a deposit in Sweden, incorporated in Canada, the founder and CEO of which is a resident of Melbourne who was born in and remains a citizen of Australia. It can be traded not only on the TSX in Toronto but also on the AMEX in New York City. Citizens of either Canada or the USA can buy shares in Tasman in their own currencies. It is nonetheless as European as a baguette or a Wienerschneitzel, and will be just as nourishing to a European manufacturer's appetite for a secure supply of crucial raw materials.

Below I have a description of Tasman's advantages and business model that I hope will be seen as a prescription for the right way to approach the development of a producing rare earth mine. By no means are all separate deposits even in the same mine identical but there is a universal best practices approach to developing such deposits into profitable producing mines. Tasman is a poster for such an approach.

Tasman's recently published Pre-feasibility study is a:

- A good study, which incorporates all costs from opening

to the closure of the mine.

- It is a realistic plan to produce REE's, because it uses...
- Conservative pricing rather than recent peer studies, and it is
- One of the major HREE projects
- One of the highest % of heavy REE's of any viable project in development, and it has a
- Long mine life – 20 years used in this study but its unconstrained mine life is 60 years

**Tasman will be a:**

Major producer of dysprosium oxide – more than 200 tonnes per year for at least 20 years. The leading smaller projects focused on the heavy rare earths have mine lives only half that long.

**Tasman will therefore be:**

Unique in the European Union (Greenland is not in the EU, but it is in Europe) so it is very well positioned for EU support and for European off-take agreements, and as noted above:

Europe has separation facilities and REE magnet making facilities. This means the idea of a secure and integrated supply chain is achievable.

**Tasman's metallurgy is:**

Based on a now well tested process developed for Tasman to recover REE's from eudialyte. This alone gives Tasman potential to make a major contribution to the supply security of heavy REE's around the world!

**In addition:**

- Sweden is a mining friendly country with trusted environmental legislation – great sustainability protection for customers of REE's.
- The mine is part of a region designated only for mining development as strategic for Sweden's future!

- The leaching of the ore is at room temperature, no roasting or high pressure needed – benign processing
- The CAPEX is low due to the great infrastructure around the site,
- The project can use local labor and sulphuric acid. This minimizes both the cost and environmental impact, and it puts maximum benefit in the local region,
- Swedes are highly skilled – customers already believe that Swedish people can run a complex REE plant, and produce high quality REE products,
- The mine has a low stripping ratio, so little waste rock needs to be moved and stored – This adds to both financial and environmental efficiency,
- The mine presents the investor with a high exposure to the most critical REE's, which have the best exposure to a potential rebound in pricing,
- Tasman has no requirement in its flow sheet or its economic model for proprietary or commercially untested technologies.
- As pointed out already, in house separation can be added later to increase margins.
- The project start up can happen in the lowest risk way – lowest CAPEX and trusted by customers
- Tasman down the road has lots of opportunities for optimization and addition of revenue.
- Zr, Hf and Nb are stockpiled in this PFS model, but will be the focus of future research
- Nora Karr is the least radioactive of all REE projects being explored. It therefore has lowest impact in this regard
- Nora Karr is in an attractive location with extensive transport/power/water infrastructure in place and is very close to major European REE consumer. Germany, for example, is accessible both by road and rail directly through Denmark, which itself is now physically connected to Sweden by bridge.
- Finally the Nora Karr project has only 2.6% of its

projected revenue from cerium (Ce) and lanthanum (La) which are forecast to remain in long term oversupply. All the capital to be used goes to the production of commercially valuable metals, and none goes to competing with the materials that are produced as a by-product in China

To understand Tasman's PFS it is absolutely necessary to place it in the correct contexts. Those contexts are the European market (and European geopolitics) and the future economy of China.

Tasman is Europe's only way to remain competitive in rare earth enabled high-tech, and for the rest of us it is a very good bet.

**Disclaimer:** Jack Lifton is a well known rare earth expert, speaker and consultant and Tasman Metals is one of his clients. All of Mr. Lifton's current Board and Advisory roles, along with his clients are disclosed in his biography on InvestorIntel.

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## Tasman – Taking the Rare Earth High Road.

It is said that Michelangelo had the ability to see a large block of raw marble and view the eventual statue as something akin to a figure "trapped inside the stone" that only needed his hammer and chisel to set it free. The hot off-the-press PFS on the Norra Karr project reminds us of that block of marble with a David trapped inside yearning to be set free.

While most about them are cowering in the fall-out shelters

waiting for the nuclear winter in the REE space to end, Tasman Metals Ltd. (TSXV: TSM | NYTSE MKT: TAS) have been forging ahead with their Norra Kärr project, hoping to bring the project to fruition as the premier European REE producer.

This week's PFS publication gives a roadmap of one way to get where the company wants to go with this project. Now it's time to turn on the GPS and find the shortest, fastest and most fuel efficient way to get from A to B rather than taking the consultant's "scenic route".

The main salient features of the PFS are:

- After-tax Net Present Value (NPV) of US\$313 million using a 10% discount rate
- Internal Rate of Return (IRR) of 24% pre-tax and 20% after tax using a 10% discount rate
- Initial capital cost of US\$378 million including contingency
- Major exposure to the most critical REE's, with 74% of revenue from magnet metals Dy, Nd, Pr, Tb, Sm
- Project able to produce more than 200 tonnes of dysprosium oxide per year for at least 20 years
- Unconstrained mine life is in excess of 60 years with extensive mineralization below and along strike from 20-year pit

## **Norra Kärr**

The Norra Kärr project located approximately 300 kms south of Stockholm. The project is near the towns of Jönköping and Linköping, from whence would come the required workforce for the mining operations.

The property was initially discovered in 1906. It was explored by the Swedish mining giant, Boliden AB, for nepheline in the late 1940's, and for Zirconium and Hafnium in the 1970's. However it was relinquished in 2001 and data from these previous efforts was only made available in 2009. The Swedish

government declared it to be a “Project of National Interest” in 2002 which prevented conflicting land use.

Tasman claimed the ground in mid-2009 and first drilling began in December 2009 with a goal of proving up a heavy rare earth and zirconium resource. The deposit now has in excess of 100 holes amounting to around 12,000 metres. The first NI43-101 compliant resource was released in November 2010 and an updated PEA came out in July 2013.

The Norra Karr REE deposit, as modelled in this PFS is a single body of mineralization, some 300m x 700m in size at surface, which begins under 0.5m average of soil cover. The mining method envisioned in the PFS is conventional open pit mining with a single simple open pit that will extend from surface to a maximum depth of 160m. This is expected to have a constrained 20-year life of mine and a stripping ratio of 0.73. It is anticipated that average annual tonnes of ore mined would be 1.18 million while waste rock mined would be 0.84 million.

## **The Capex**

The fatal flaw in all REE projects these days is the capex. That of the Norra Karr project according to the PFS is a chunky US\$378mn. It also estimates that an additional US\$44.3mn will be required during the life of the project in sustaining capital. The breakdown of the capital items is shown in the table below. We would have liked to have seen more granularity in the omnibus “Process & Tailings” number so we could pares its individual constituents and compare against other projects.



Mining is admirably low and the infrastructure spend is kept down due to the facility’s well-serviced location. As usual with the consulting crowd they have liberally larded the budget with padding to make sure there is no blowback in their

direction. It's now up to management to mark the consultants' performance report with "can do better" and show them how to get the budget in at a much lower figure that is financeable in the current tough environment. If any REE company's management are up to the task of coming up with a better plan, then it is the very hands-on and practical crew at Tasman.

### **A Baltic Combination?**

As we have said before Tasman remains one of the prime takeover (or better, merger) targets in the REE space. The deal that strikes us as most obvious is some sort of arrangement with the 800-lb gorilla in the REE space, Molycorp. The rationale behind this one is simple in that Molycorp owns the Silmet processing plant in Estonia which used to source the bulk of its material from the Russian loparite mines. With those mines in a state of decay, the next obvious source with reasonable proximity is Norra Karr with a rather short maritime voyage away. Molycorp is not in the healthiest of conditions itself these days, but should it survive this current swoon then the synergies between these two assets are pretty clear. It would be interesting to know what sort of savings on the Tasman capex might be able to be achieved by exploring this possibility of a tie-up.

### **Conclusion**

There is an old adage that those packing for a trip should pack the suitcase and then throw half of the stuff out of the suitcase. Having spent years watching the machinations of mining consultants with their ass-minding, fee-generating ways we have come up with our own spin that one should take a capex number, halve it and then get the consultants to justify every cent when growing the number again. The on-going use of sizeable contingencies (20% in this case... though down from the 25% fashionable a couple of years back) shows that the mining industry is yet to grasp the concept used in building a

McDonald's store that the project must come in on budget.

We have resolved to finally retire our old REE mantra of chemistry, chemistry, chemistry and replace it with right-sizing, right-sizing, right-sizing. The current projected capex at Norra Karr is a good starting point for revisionism. While the capex number is not one of the largest numbers out there, if one takes away those projects (which shall go unnamed) that have now being *sotto voce* mothballed, Norra Karr ends up "out there" at the higher end of the unbuilt projects that remain viable.

In light of the uber-competence of the management group at Tasman (and sister entities) we would not be surprised to see the consultants sent to stand in the corner with the dunce's cap on to rethink what they have come up with and right-size the PFS as the basis for the DFS and actual building.

Hopefully in the meantime some reconfiguration of the assets of Molycorp could create a combination with Tasman on the shores of the Baltic that makes Tasman the *primus inter pares* in the mammalian survivors of the Great Extinction Event, which will see Lynas and Molycorp marched off to the dinosaur hall of the Natural History Museum.

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## **Tasman Metals – Masters of All they Survey in Scandiland**

Ever since the Tasman/Flinders merger deal was floated it was apparent that Tasman (TSXV: TSM | NYSE-MKT: TAS) wanted the benefits of diversification would bring. After all, if you a betting on a horse race it's better to have stakes on two favoured horses rather than just one. The Flinders deal went

away and Flinders went on focus on its graphite mine and plant. Tasman has the longer haul REE project at Norra Karr to bring to fruition. The rationale of the earlier merger was to have one advanced project and one longer term one going at the same time. Finding a more advanced REE project than Norra Karr is no easy task, with many REE projects being more like a pack of snails dashing for a finishing line.

Thus to get something that will fill the gap between now and the ribbon-cutting on production at Norra Karr requires something NOT in the REE space because it needs to be something plug and play. This is the antithesis of the available REE projects, with their massive lead-times. Tasman has opted for one of our old favorites, Chromite.

### **DSO, the Way to Go?**

If there is not a big hurdle in infrastructure shortage, then a product that can be produced as Direct Shipping Ore (DSO) is one of the simplest products to move from mine to market. The main mineral products that are traded in this form are also the world's most traded minerals iron ore, manganese, bauxite and chromite. Most are sold in a strictly un-upgraded form though some minimal effort can be made to get them into a more value added state. For example magnetite can be separated from surrounding non-ferrous material by using large magnets to pick up the ore. Manganese and bauxite are rarely beneficiated much at site and chromite is the one most subject to potential value-added via conversion into ferrochrome. As DSO means large scale products movements at high grades it also requires bulk movement on the projects with the largest capex numbers going towards, conveyors, rail connections ports and the required loaders. The more economically developed the location the less these added expenses are required of a project developer.

### **Tasman's Move –Chromite in Finland**

North-eastern Finland has been a very active exploration district, following the discovery of the large Sakati Cu-Ni deposit by Anglo American, which was announced in November 2011.

Tasman has acquired two chromite projects (Akanvaara and Koitelainen) that lie approximately 75 km apart in north-eastern Finland. The projects total 11,400 hectares in size and the company paid CAD\$45,529 to pick up these assets. Both have had extensive previous drilling, metallurgical testing and historical resources. Both are easily accessible by road.

The Akanvaara and Koitelainen chromite projects are of a stratiform intrusion-hosted style (compared to podiform deposits in locations like Albania). According to Tasman these, together with similar deposits on the Kola Peninsula of Russia, constitute one of the largest known undeveloped resources of chromite in the world. The Akanvaara and Koitelainen intrusions are part of a group of Archean/early Proterozoic mafic layered intrusions within the Fennoscandian Shield, which show cumulate igneous layering similar to other large layered intrusions (Fiskenaesset, Burakovka, Bushveld), and host deposits of **chromite, vanadium, titanium, PGE's and gold**. The new projects lie along the geological trend of the producing Kemi chromite mine, owned by Outokumpu, that has been producing since 1966.



In addition to stratiform chromite, Tasman feels that the projects have potential for both platinum group metals (PGM's) and Vanadium (V). This is no surprise as PGMs often occur with Chromite.

### **Chromite – Relatively Immune to the Steel Blues**

Having once been a director of a Chromite company the attractions of this metal come easily to mind. For us it was the easy mining and shipping that proved to be the main

attraction. We have most particularly looked at the metal in Albania (where the metal was once so synonymous with the country that China managed to peel it off the Soviet Bloc just so they could exclusively have its supplies) and Turkey where there is quite a lot of production but mainly from quasi-artisanal mining operations.

Chromium (Cr) is an essential industrial element due in particular to its strengthening effect on steel alloys and its resistance to corrosion. The main application is as Ferrochrome (FeCr), which is a corrosion-resistant alloy with 80% of FeCr output goes towards Stainless Steel production. The average chrome content in stainless steel is 18% and stainless steel requires a minimum of 10.5% Cr by mass to impart favorable strength and anti-corrosion properties.

The remaining chromite is used in the aeronautics (for the protection of aluminium aircraft bodies), foundry, chemical and refractory sectors. Overall, demand growth for stainless steel and therefore chromium is forecast in the range 4-5% per year to 2020. The price trend for Ferrochrome has not been as depressing as for most other bulk commodities either...



China is the leading chromium-consuming country and the leading stainless steel producer. China produced 17 to 18 million metric tons of stainless steel and produced 3 million metric tons of high-carbon ferrochromium, the leading chromium ferroalloy used to make stainless steel. According to the USGS, China, anticipating a 500,000 ton-per-year-increase in stainless steel production, boosted its ferrochromium production capacity by 1.5 million metric tons in recent years. China's chromite ore imports were expected to increase to support increased ferrochromium production as were its ferrochromium imports to supplement that domestically produced for stainless steel production.

South Africa has been the leading chromite ore and ferrochromium producer. A couple of years back, South Africa's electrical power generating group declared an emergency because of the country's constrained electrical power supply. The power group negotiated short-term buyback deals with ferrochromium producers. However it should be noted that at the same time the government there took exception to the practice of exporting chromite ore in a DSO form to China for elaboration in Asia into FeCr and thus slapped restrictions on exports much in the same way Indonesia has done with Nickel and Tin and that the DRC has spoken of in Copper and Cobalt.

Tasman sees a niche for any potential output from its new assets in serving European stainless steel producers. They rank second only to China in scale and account for some 20% of global output. Europe's share of world chromium metal demand is equally significant, estimated by the European Commission at 1.8 million tonnes (approximately 18.5% of global consumption). The Kemi mine of Outokumpu in northern Finland is the EU's only chromium supplier. The US consumes about 6% of global chrome production and has no production though Stillwater in Montana are said to have some resources in this metal.

There is however no shortage of the metal and according to the USGS, world resources are greater than 12 billion tons of shipping-grade chromite, sufficient to meet conceivable demand for centuries. About 95% of the world's chromium resources is geographically concentrated in Kazakhstan and southern Africa. However, it should be noted that the metal emanates from other places as well. Production from Albania is patchy these days and Turkey is a player. Canada used to be a producer with mines in the Thetford Mines area of Quebec.

## **Conclusion**

As emerging "new" mining districts go, Scandinavia is one of the least new. The long history of mining in the region was

essentially forgotten by those outside the region post-WW2 as the area was regarded as an industrial wonder and home to stultifying social security and tax systems. However companies like Boliden forged on with their traditional mining activities. With a number of years of experience in the region behind it Tasman now feels comfortable in spreading its wings across the region and across the different resources available in this richly geologically endowed area. Instead of being a playing field only for local companies it has become the favoured area for mine development in Europe in the space of just one decade. A very skilled and educated workforce combined with government's that know the worth of mining's value added makes it a totally different equation for the other "emerging" mining regions with rapacious and fickle administrations.

Tasman's management has now been immersed for years in the Scandinavian way of doing things and are clearly comfortable with the idea of getting even further into the mining scene in the region. That they have chosen a non-challenging metal, in terms of extraction, processing or pricing, is indeed a welcome sign.. To top it all off there are no listed Chromite stories we know of outside of the South African player, Merafe. This will give Tasman a further USP...