

HALLGARTEN & COMPANY

Coverage Update

Christopher Ecclestone
ceccestone@hallgartenco.com

Mkango Resources

(AIM: MKA, TSX-V: MKA)

Strategy: LONG

| Key Metrics | |
|--------------------------------------|--------------|
| Price (GBP) | £0.049 |
| Price (CAD) | \$0.060 |
| 12-Month Target Price (GBP) | £0.180 |
| Upside to Target | 269% |
| 12mth hi-low (GBP) | £0.02 - 0.05 |
| Market Cap (UKP mn) | \$4.817 |
| Shares Outstanding (millions) | 98.7 |
| Fully Diluted (millions) | 168.2 |

Mkango Resources

Making It to the Final Five

- + Recovering Rare Earth prices provided a fertile environment for reconsidering the sector's attractions
- + Talaxis/Noble entered into the share register with a small financing in October and has since escalated involvement with a substantial stake being taken at the project level in exchange for funding the BFS and arranging project funding for the build
- + The travails of Peak Resources now place Mkango as the most advanced African project of substance
- + Mkango has one of the strongest group of institutional/core shareholders that we have seen in a REE explorer
- + BFS in the works with "right-sizing" options under active consideration
- + Deal with Metalysis provides first sign of vertical integration (and the search for higher margins) while creating a potential offtake client
- + The potential is there for the REE space to achieve a significant rerating once the investor universe realizes that the sub-space is joined at the hip with the EV revolution
- ✗ The capex is targeted at slightly over \$200mn which will require significant funding being arranged by Talaxis/Noble
- ✗ Noble been experiencing travails in the marketplace since 2015 as a legacy of the long commodity slump
- ✗ The Rare Earth space is not out of the woods yet and is only as fragile, or as strong, as the reactivation in the broader mining markets

Darwinian Forces

The original discovery of Rare Earths did not intersect with the works of Charles Darwin but, with the passage of time, economic Darwinism has come to impact upon the Rare Earth space. Indeed REEs have become somewhat of a poster-boy for the theory. From somewhere between 200-300 players in 2010-11, we are now left with maybe 15-20 players, of which the most interesting are what we would call the "final five".

The brutal forces continue to operate despite an improving pricing scenario for REEs. Peak Resources unfortunately had the rug pulled out from under it thus allowing Mkango, the quiet performer of the African REE space to creep into the final five in recent months. In this piece we shall review its progress and latest developments.

Rare Earths in Africa – A Shifting Landscape

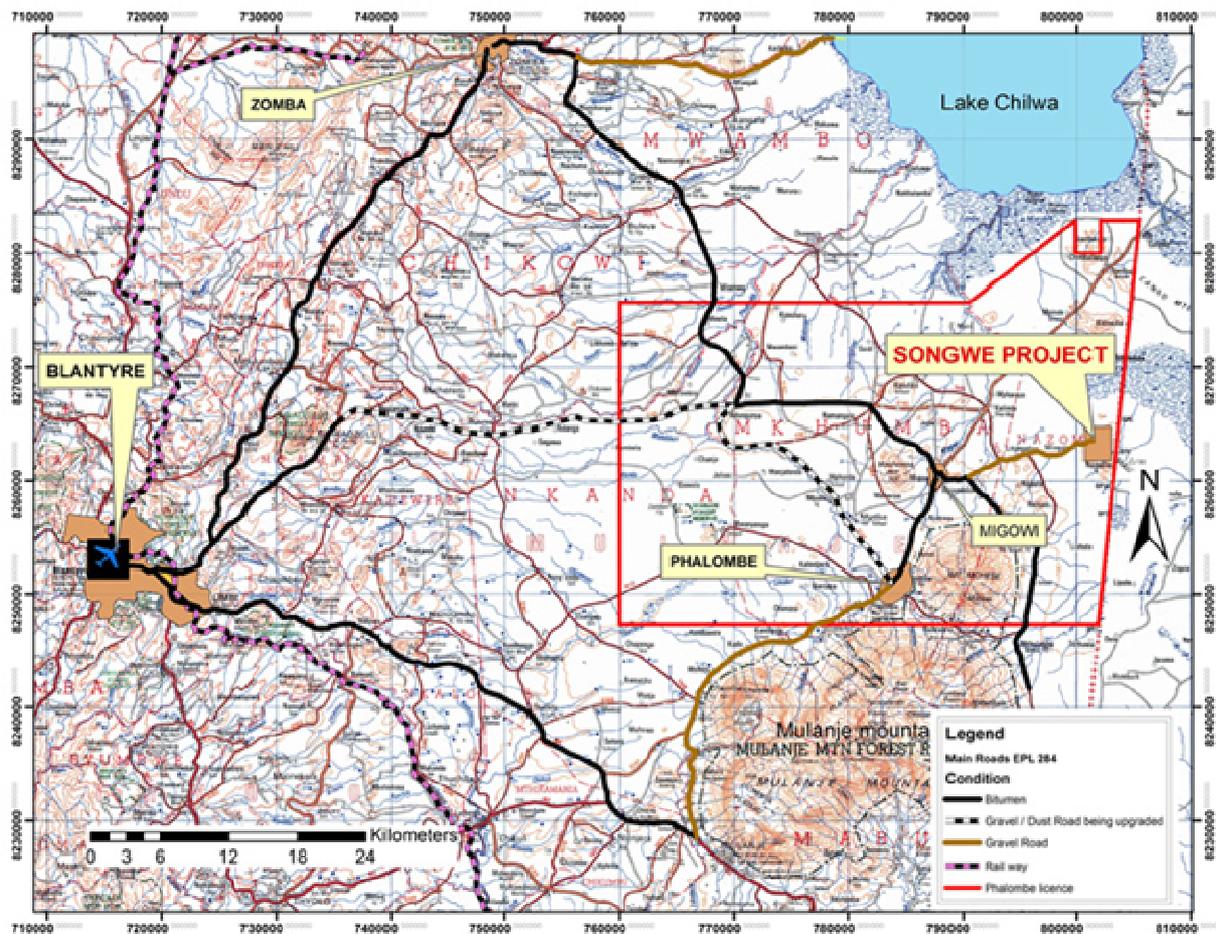
In the beginning the REE focus in Africa was south-eastern Africa with Namibia and Steenkampskraal in South Africa capturing most of the attention. After the travails in those parts East Africa rose to

prominence and unfortunately the leading player, Peak Resources has run into heavy weather with the capriciousness of the Tanzanian government. Recent months have seen the appearance of an REE player in Burundi, but the main play in Africa is now Mkango that stuck to its guns thick and thin and is now the best –positioned to join the ranks of producers in the foreseeable future.

This update should be read in the context of the previous research notes we have written upon the company that expand on different aspects of geology, processing etc. at different stages in the project’s evolution to minimize repetition.

The Songwe Hill Project

Mkango’s Songwe Hill REE Project is located within the 100% owned Phalombe License, which covers a portion of the Chilwa Alkaline Province in Southern Malawi. The project area is located approximately 70 km SE of the city of Zomba and approximately 90 km ENE of the city of Blantyre in the Phalombe District. All-weather roads link these centers with the town of Migowi, approximately 15 km from Songwe Hill, and are currently being upgraded to bitumen. Secondary gravel roads provide vehicle access to the exploration camp. Migowi is connected to the national electricity grid.



Financing - Up Close & Personal with Noble

Before reviewing the current state of progress with the project it is vital to look at the direction that strategic relationships have taken for Mkango because therein lies the potential to move Mkango out of the REE *wannabe* column into the rarified group of REE mine developers. Key to understanding this is the evolving relationship with Talaxis, a subsidiary of the metals trader, Noble Group.

At the end of 2016 Mkango announced the entry of Noble Group as a strategic shareholder and as its most likely marketing partner. It termed this a collaboration agreement with Noble Resources International.

Under the key terms of the Agreement, Noble will provide the following services to Mkango:

- ✓ Identifying the optimal markets and counterparties for Mkango's future rare earths production from Songwe Hill, during the bankable feasibility study and in advance of mine development
- ✓ Identifying and advising on the best strategy for the product mix given the international market for different rare earths concentrates and separated rare earths oxides
- ✓ Identifying the optimal logistics route to take the production to market
- ✓ Introductions to potential strategic partners to finance development
- ✓ Assistance in market-related discussions with key stakeholders, including Mkango's financial, technical and legal advisers, prospective investors and lenders and relevant government agencies
- ✓ Noble will also have the right to negotiate a marketing services agreement for Rare Earths produced

At the same time Mkango raised £450,000 (£430,125 net of finders' fees) from existing shareholders and new institutional investors. These were two specialist Swiss mutual funds, the Rare Earth Elements Fund and the Metals Exploration Fund, and as a result each held an interest of 3.6% in Mkango.

In total the placing involved 12,857,124 common shares at GBP 3.5 pence per common share. This represented premiums of 29.6% and 1.5% relative to the recent closing prices of Mkango on the TSX Venture Exchange and AIM, respectively.

The main uses of proceeds was to accelerate the optimisation of the processing flow sheet and evaluation of product marketing options to facilitate further marketing, offtake and partnership discussions, as well as to evaluate additional opportunities and other expenditures.

Then in late October 2017 the company announced it had closed a placing whereby Talaxis Ltd, a wholly-owned subsidiary of Noble Group invested £500,000 (CAD\$833,333) at 3.5 pence (CAD\$0.058) per equity unit to acquire a 14.5% interest in Mkango. The company also issued 12 million common share purchase warrants to Noble, with each whole warrant entitling Noble to acquire one common share at a price of 6.6 pence for a period of two years following the date of the agreement. Exercise of these warrants would give Noble a 20% interest in Mkango, making it by far the largest shareholder.

These various transactions also classify Mkango as one of the few REE companies with a substantial institutional/strategic presence on the register, with most others dominated by retail investors.

Talaxis/Noble on the Scene

The key trigger for a Rare Earth project to leave the drawing board and start to “get real” is the appearance on the scene of a strategic shareholder with some relevance to the space. Sadly, history has shown that strategic investors that bring just money to the table are useful in the short term and aid survival through the lean patches but ultimately they are not helpful in gaining credibility in the “trade” circles that are vital to securing an offtake and the type of big money that takes a project to production. For this reason the entry of Noble into the shareholder register (and essentially into partnership on marketing) may prove to be a seminal moment for Mkango that has seemed to go relatively unnoticed.

To state the obvious, Noble is one of world's largest commodity traders and the largest in Asia, with a presence throughout the region. It is listed on the Singapore Stock Exchange trading as SGX:CGP.

The vehicle that Noble is using for its relationship with Mkango is its wholly-owned subsidiary, Talaxis Limited. In the official definition this is a “vertically-integrated investment vehicle created to invest in high-quality upstream, midstream and downstream ventures in the new energy and technology metals sectors” with a focus on development of new resources or elements which are critical to the decarbonisation of the grid, including cobalt, lithium, and Rare Earths. It is also involved in the research and development of industrial applications related to energy solutions providers and permanent magnet consumers. In layman’s language though it is somewhat of an incubator in the new energy space.

The Deal

Until recent weeks the relationship with Talaxis/Noble only looked like a marketing relationship in Rare Earths with a minor investment component (via warrants). Then the commitment was lifted to a higher level through an earlier equity investment than anticipated (via the £500k placing to Talaxis). Then this week it was announced a more detailed deal had been struck that forged a much closer relationship and brought Talaxis in at the project level.

The terms of the transaction were:

- ✓ Talaxis agreed to fully fund a bankable feasibility study for the Songwe Hill Project in return for a 49% interest in the Project
- ✓ Talaxis will invest £12mn (CAD\$20 million) in the Project for expediting the BFS in three tranches, with the first tranche of £2mn (CAD\$3.3 million) invested on receipt of regulatory approval
- ✓ Talaxis will also have the option to acquire a further 26% interest in the project by arranging funding for the project’s development
- ✓ Talaxis may also acquire up to a 49% interest in a new venture to be established by Mkango focused on neodymium alloy powders, magnet and other technologies, including Mkango’s collaboration with Metalysis, by investing £2 million (C\$3.3 million) in two tranches, with the first tranche of £1 million (C\$1.7 million) invested 45 days after receipt of regulatory approval
- ✓ Upon completion of the above investments, Mkango will retain a 25% interest in Songwe, free carried to production, and a 51% in interest in the new venture
- ✓ Talaxis and Mkango have agreed to cooperate as preferred partners on Rare Earths projects both in Malawi and internationally

The last point is interesting because it effectively marries Mkango to Talaxis as each other's partner of choice for expanding in the REE worldwide. Talaxis will be granted a right of first offer to finance any such activities of Mkango. All such opportunities will be offered to Mkango on a 50/50 shared economics basis, with Mkango being entitled to participate to any level that it chooses.

The Mechanism

The first £2mn Phase 1 investment commitment will be provided upon receipt of regulatory approval, upon which Talaxis will receive an 8% interest in Lancaster (the vehicle in which Songwe Hill is held). The Phase 2 investment commitment (of £3mn) will be provided 45 days after receipt of regulatory approval, upon which Talaxis will receive a further 12% interest in Lancaster. The use of proceeds will fund the first phase of the BFS including infill, geotechnical and exploration drilling, bulk sampling, processing flow sheet optimisation, work in relation to the Environmental, Social and Health Impact Assessment (ESHIA) and other expenditures. The subsequent investment stages consist of:

- ✓ A £7mn Phase 3 investment commitment for the Project to be invested, subject to Talaxis and Mkango completing the definitive Joint Venture Agreement, on Mkango publishing an updated 43-101 compliant resource, upon which Talaxis will receive a further 29% interest in the Project. The use of proceeds will be to fund completion of the BFS
- ✓ Talaxis (upon completion of the BFS) will have the option to acquire a further 26% interest in the Project and offtake rights for 100% of production from the project (excepting that required for the downstream manufacturing activities) in consideration of Talaxis arranging funding for 100% of remaining project development costs, including funding the equity component thereof

The equity required for project development, based on the capex in the PFS, could be around £80m (US\$108mn) assuming 50/50 equity/debt split.

The New Venture/Newco will be discussed anon in the context of Metalysis.

So effectively Talaxis is earning 75% of the Songwe Hill project for £12mn in cash (plus arranging the project finance). The total Phase 1-3 investments values Mkango's 51% stake (at the point of completion of the BFS) in the project at a smidgeon over £12mn. In some ways though one could argue that the valuation is actually reached at the point that Phase 2 is completed because it is then that the £7mn contribution comes into the JV.

On completion of the investments, Mkango's interest is free-carried to production with a fixed 25% share of the project so, post development, its valuation might be calculated as 25% of the post-capex NPV i.e. circa £100m based on the PFS. These valuations are a multiple of the company's current market cap (without considering the value of the Metalysis arrangement - discussed later - and other assets, such as the Thambani deposit).

Noble's Travails

Noble was regarded as one of the walking wounded of the 2015 commodity "last gasp" when even Glencore's survival was called into question. The Swiss giant turned around rather swiftly by taking some

Geologists have interpreted Songwe Hill as a volcanic vent that is expressed as a steep-sided hill with a diameter of approximately 800 metres. Surface mapping and drill core indicates that the vent complex consists of a multiphase intrusion characterized by diverse carbonatites and breccias exhibiting a range of alteration. The vent abuts against the western slope of the large Mauze nepheline syenite intrusion, but the outer contacts on the western and northwestern sides of the vent are hidden beneath recent surficial deposits. Below can be seen Songwe Hill in the middle, abutting Mauze Hill (to the right).



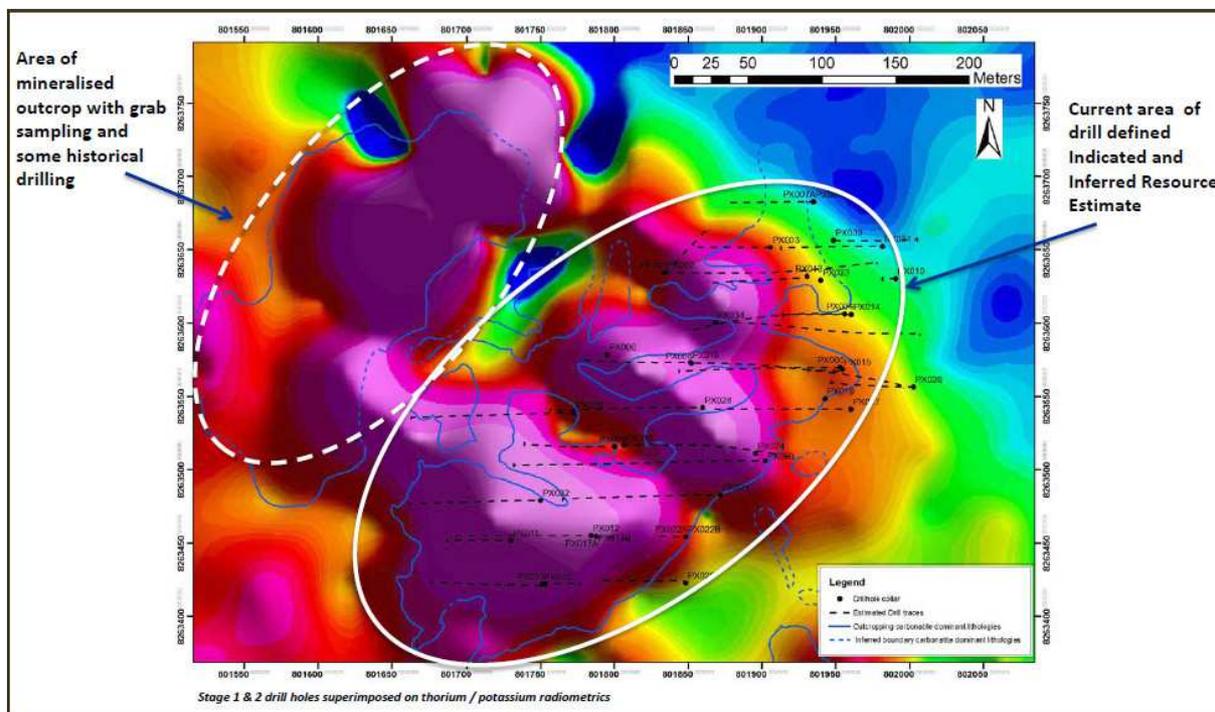
The consultants preparing the resource estimate conjectured that the carbonatite complex is in contact with Precambrian gneisses in this area because Chenga Hill, which is located less than 200 m west of the probable western margin of the Songwe vent, includes fenitized gneisses and breccias. The carbonatite is best exposed along the north-eastern slope of Songwe Hill and, together with a somewhat smaller area along its north western edge, is tentatively interpreted to form a ring structure in a high level vent system.

The REE mineralization is lithologically-controlled and the highest concentrations and greatest volumes of mineralization occur specifically within the carbonatite bodies. The carbonatites are believed to have been REE-enriched when they were intruded and the REE have apparently been redistributed and enhanced by late-stage hydrothermal activity and are now principally residing in synchesite and apatite.

REE mineralization is present in carbonatite, fenite and breccias, which are exposed intermittently over a surface area of approximately 350 m by 100 m.

The REE mineralization is untested to the northeast and southwest beyond the limits of the present drilling and below the deepest vertical intersection of approximately 350 m below the surface of the hill.

The radiometric survey on the following page shows the potential of a substantial area to the northwest to replicate the existing resource.



The Resource/Reserve

The company announced in November 2012, a maiden mineral resource estimate. The resource estimate prepared by MSA Group indicated an Indicated mineral resource of 13.2mt, grading 1.62% and Inferred mineral resource of 18.6mt, grading 1.38 at 1% TREO cut-off grade.

Pre-Feasibility Studies

In our original launch of coverage back in 2014 the company was on the verge of revealing its PFS. It subsequently, in November 2015, issued an Updated PFS which is now the guidemap to how the project might look in a context of being fully built to spec.

| Mineral Reserve Estimate - 2015 | | | |
|----------------------------------|---------|----------------|-------|
| Cut-off 1% TREO | | | |
| | | Tonnage | Grade |
| Probable | | 8.5mn tonnes | 1.60% |
| Mineral Resource Estimate - 2015 | | | |
| | Cut-off | Tonnage | Grade |
| Indicated | 1.0% | 13.2 mn tonnes | 1.62% |
| | 1.5% | 6.6 mn tonnes | 2.05% |
| Inferred | 1.0% | 18.6mn tonnes | 1.38% |
| | 1.5% | 5.1mn tonnes | 1.83% |

In the latest version the Capex and Opex were updated to reflect movements in equipment, reagent and other costs, in addition to exchange rates. The inputs were driven by a Rare Earth market review from Adamas Intelligence to evaluate the future rare earth market that was commissioned by Mkango. The key takeaways from the updated Study were:

- After-tax net present value (NPV - 10%) of US\$345mn and an after-tax IRR of 37% based on a long term Rare Earth basket value of US\$59.8 per kg rare earth oxide (REO)
- Initial Capex of US\$216mn, including a contingency of US\$20mn
- Cash operating costs average US\$13 per kg REO for the first five years of production and US\$16.40 per kg REO for the life of mine with an additional cost of US\$10 per kg REO to account for the cost or discount associated with tolling or the sale of a chemical concentrate
- Production of 2,841 tonnes of REO in mixed chemical concentrate per year over an 18-year mine life
- A large proportion of the Cerium is removed during the hydrometallurgical process, significantly enhancing the basket value of production
- Over 80% of basket value is attributable those Rare Earths used in the high-growth permanent magnet applications, comprising over 65% attributable to Neodymium and Praseodymium, and over 15% to the Heavy Rare Earths, Dysprosium and Terbium

Plant & Processing

The goal of the first phase of the development is to produce a heavy and critical Rare Earth-enriched chemical concentrate. The Cerium will be removed and stockpiled during the hydromet flow sheet. This system will work with low-strength acid, by inference enabling the use of plastics or composite materials for tanks and pipework. This will also facilitate acid recycling using cheaper sulphuric acid. A short leach time allows for a significant size reduction for the hydrometallurgical plant. This will utilize conventional technology with the plant design largely comprised of tanks, pumps and filters.

CapEx

The updated PFS came in with virtually unchanged Capex at \$US\$216.5mn, when compared to the previous version, with the majority of this attributable to the processing plant ie beneficiation plant, acid and hydromet plant. The mining Capex in itself was minimal at only \$1.7mn.

Mining itself will be contract mining, so that becomes an opex rather than a capex issue. The operating cost of contract mining is estimated at around \$4-5 per tonne mined.

Based on the Talaxis commitment, the company is budgeting £12mn for the BFS giving ample scope for additional resource and geotechnical drilling, pilot testing, a full ESHIA and other BFS related

| Songwe - Updated CapEx | |
|----------------------------------|--------------|
| | US\$ mn |
| Mine | 1.7 |
| Site facilities / infrastructure | 21.8 |
| Beneficiation plant | 43.0 |
| Hydromet plant | 54.4 |
| Sulphuric Acid plant | 34.7 |
| Tailings | 12.7 |
| Power supply | 14.5 |
| Other costs | 14.0 |
| Contingencies | 19.7 |
| Total | 216.5 |

expenditures.

Right-Sizing

The well-known Rare Earth commentator, Jack Lifton stated early on in the first Rare Earth boom that the key to reaching production would be what he called “right-sizing”. The market ignored this and instead companies built oversized projects to suit consultants and the tenor of equities markets rather than the potential of the market to absorb whatever REE mix was being produced. Time has passed the folly of over-building has been realized. Mkango grasped the gospel of “right-sizing” from the beginning and the PFS was based on a fairly modest scale operation and therefore resulted in amongst the lowest capex of its (then) peer group. The new BFS will encompass the maximum flexibility possible in putting together a viable project both in terms of scale and scope. Amongst the options, there is potential for a higher grade initial phase of development followed by a second phase of expanded production, supported by the significant resource base.

In terms of optimising the scale and phased production scenarios key considerations are as follows:

- Mining – use of a contract miner so this can be smaller or larger, with minimal capex in either scenario
- Mill/flotation – company will evaluate options during BFS
- Hydromet – a modular plant
- Sulphuric acid plant – potential synergies in the region. This will be looked at in the BFS.

With regards to the acid plant if there was spare capacity to produce excess sulphuric acid, it could sell or utilize excess production in the production of fertilizer or for other projects in the country. Also the more the capacity, the more power the project would co-generate. Other options would be to import sulphuric acid and not built a plant initially, or utilize a shared plant for different operations.

Metalysis

The gospel of vertical integration is spreading through the remaining ranks of players in the REE space. We have long posited that having an REE mine and processing plant alone is to leave too much of the value-added on the table for others and is an exercise in margin minimization rather than maximization. Pursuing value-added also provides an outlet for part of the production flow that one may not want to go to an exclusive off-taker.

Mkango made its move into value-added back in March 2017 when it announced a Memorandum of Understanding with Metalysis Limited to jointly research, develop and commercialise novel Rare Earth metal alloys for use in 3D-printed permanent magnets. Metalysis is based in South Yorkshire, U.K, with global rights to technology posing proven economic and environmental benefits over traditional metal production methods. Metalysis' process, originating from the University of Cambridge has been proven at industrial scale for the manufacture of metal powders for markets including 3D printing and applying its technology to Titanium, Tantalum, other metals and innovative alloy powders.

This investment was originally Mkango alone but in the general reconfiguring of the relationship with Talaxis/Noble in mid-November the connection has been expanded to include Talaxis as well. By

investing £2 million (CAD\$3.3 million) in two tranches, Talaxis will receive a 49% interest in a Newco to be established by Mkango to further develop, commercialise and market production in relation to new rare earth alloy powder, magnet and other technologies. The use of proceeds includes expenditure under the previously announced agreement with Metalysis. Upon completion of the investments, Mkango will hold a 51% interest in Newco. The Agreement provides that:

- ✓ A £1mn Phase 1 investment commitment for Newco to be invested 45 days after Mkango obtaining regulatory approval for the agreement, at which point Talaxis will receive a 24.5% interest in the Newco. The use of proceeds will be mainly to fund the Phase II research and development program (discussed below) with Metalysis
- ✓ A £1mn Phase 2 investment commitment for Newco to be invested, subject to Talaxis and Mkango completing the definitive Investment Agreement, on successful completion of the Phase II R&D program with Metalysis, upon which Talaxis will receive a 24.5% interest in Newco. The use of proceeds will be to fund the R&D program with Metalysis

That Talaxis will invest £2mn to obtain nearly 50% of the venture holding the Mkango investment in the Metalysis collaboration effectively values Mkango's existing deal with Metalysis at £2 mn also, which is poignant considering the low current valuation of the whole of Mkango.

The Downstream Strategy

Together, the parties envisage a comprehensive research and development program with a view to building a manufacturing plant to exploit a commercialised technology. At the time of the deal Mkango indicated that its share of the first phase of R&D costs would be funded out of existing cash resources.

The goal is to combine Mkango's intelligence surrounding the performance characteristics and future demand outlook for Rare Earth magnets with Metalysis' solid-state process, hopefully generating higher margins from the manufacture of metal powders for markets.

The prime advantage is seen as the opportunity to produce the NdFeB alloy powder using the Metalysis solid state process. The ability to produce an alloy powder without melting therefore lower cost, lower energy input, more environmentally friendly is a game-changer, in addition to the ability to better control physical characteristics of the powder such as grain size (in broad terms characteristics of oxide powder input determines characteristics of alloy powder output, with the former determining the latter and no intermediate melting involved).



There are a wide range of potential alloy combinations (which wouldn't normally be possible using conventional methods) that could enhance magnet performance.

The Metalysis powders are particularly amenable to 3D printing, which is the second opportunity. While the aforementioned alloy powders could be used for conventional production, the ability to tailor particle size and physical characteristics make them particularly suited to 3D printing. The use of 3D printing of magnets is at an early stage of development but could form a very interesting niche. There is potential to bring in additional partners on this aspect. At the moment most magnet production is in China and production outside tends to be niche, high-end magnets, and this would fall into this category. So in first stages with Metalysis the main focus will be on alloy production using their process as this will carry major benefits in itself, but in parallel, there will be an evaluation of 3D printing's potential.

Management feels that the ability to ultimately sell alloys to magnet makers would significantly increase Mkango's marketing flexibility i.e. being able to market purified mixed chemical concentrate and/or NdPr and/or NdFeB alloy powders and/or 3D printed magnets. This sets Mkango apart from the other players in the REE space who are leaving the valued-added to end-users.

In September, Mkango announced the successful completion of Phase I R&D, which saw the production of a neodymium-iron-boron alloy powder using Metalysis' solid-state technology.

Next up is the Phase II work program with Metalysis, including quality optimisation, test work scale-up, and further analyses of the alloy to determine characteristics such as its morphology, chemical composition, and physical and magnetic properties. Phase II will also incorporate customer appraisal of the product and further investigation of opportunities in relation to 3D printing of magnets.

Thambani – the Uranium (et al.) Prospect

The Thambani exploration license, located in Mwanza District, was originally granted by the Malawi Minister of Natural Resources, Energy and Environment on September 10, 2010 in respect of an area of 468 km². It was renewed for a further two years in September 2013.

Exploration identified a number of areas with potential for uranium, zircon, corundum and niobium and follow up exploration was recently conducted with the results announced back in May. The main objectives of the program were to confirm previously identified high grade mineralisation at the Little Ngoni target, ground-truth new geophysical targets and complete further reconnaissance sampling along the East and West Ridges.

Assay results from 85 rock grab samples returned high grade uranium, tantalum and niobium values, ranging up to 3.3 % U₃O₈, 1.9 % Ta₂O₅ and 6.0 % Nb₂O₅. Of the samples, 35 graded above 500ppm U₃O₈ and 24 graded above 1000 ppm of U₃O₈.

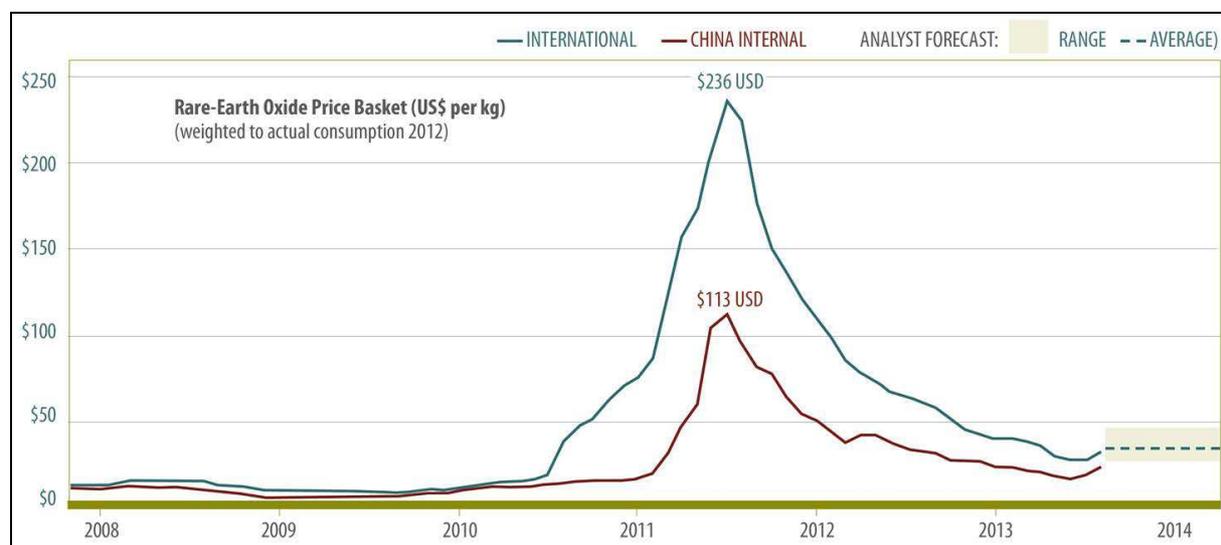
New areas of high grade uranium, tantalum and niobium mineralisation were identified at the foot of the West Ridge and on the East Ridge. Most significantly, a radiometric high at the foot of the West Ridge yielded two of four highest grade samples of this phase of exploration.

Uranium is not a priority for Mkango but has clearly not been forgotten. Thambani is a playing piece that can be JVED out, an earn-in set up or used for raising some funds on the side via an outright sale.

The Revival of the REE Space

The prices of some Rare Earths have stirred from their long slumber. The past two years have seen the selective reawakening of various metals after the brutal 2011-15 period and, comparatively speaking, Rare Earths and Uranium have been the laggards in this process. In 2017 a few of the more sought-after REEs have started to move higher.

One does not need to be a conspiracy theorist to perceive that the rise and then plunge in Rare Earth prices between 2009 and 2011 was largely a manufactured event, with the Chinese pulling in the levels in the process. In retrospect it could have been handled much better by the Chinese, and by their customers. The price surge and then plunge is even better documented by the chart below:



Source: Metal Pages/IMCOA

This begs the questions: Is the latest upmove because China wants REE prices higher or simply supply/demand dynamics or something else that mere mortals are not allowed to know?

The legacy of the up-move, after decades of somnolence, was an increased awareness of the fragility and fickleness of supply, combined with a generalized feeling that strategically, no matter where prices were, the West would be better served by having a greater choice of non-Chinese sources. The strange thing about the rise was that Cerium and Lanthanum, two metals that were never in short supply joined in the price rise as much as the scarcer and more sought after REEs.

No prices are on the move again. The table below with data from Argus Metals (and Hallgarten estimates out to 2020) shows the current spot prices. These are still trading at below the long-term average price but we have ceased to show these as they include the highly deceptive 2009-2011 period which in retrospect is viewed as pure manipulation.

| REE OXIDES | | | | | | |
|---------------------|---------------|---------------|---------------|-------------------|-------------------|-------------------|
| Price Deck | Toyota | Argus | Argus | Hallgarten | Hallgarten | Hallgarten |
| \$ per kg | 2016 | Mar-17 | Oct-17 | 2018 E | 2019 E | 2020 E |
| | \$ | \$ | \$ | | | \$ |
| Lanthanum | 10.00 | 2.10 | 4.60 | 3.80 | 3.60 | 3.20 |
| Cerium | 5.00 | 1.75 | 3.00 | 2.00 | 2.20 | 2.50 |
| Praesodymium | 75.00 | 49.20 | 78.00 | 76.00 | 84.00 | 90.00 |
| Neodymium | 75.00 | 39.20 | 60.00 | 61.00 | 72.00 | 92.00 |
| Samarium | 9.00 | 1.97 | 1.98 | 3.00 | 3.75 | 5.00 |
| Europium | 500.00 | 66.00 | 78.00 | 78.00 | 85.00 | 95.00 |
| Gadolinium | 30.00 | 29.00 | 42.85 | 43.00 | 78.00 | 93.00 |
| Terblum | 1600.00 | 438.00 | 520.00 | 550.00 | 580.00 | 630.00 |
| Dysprosium | 750.00 | 197.00 | 185.00 | 266.00 | 305.00 | 393.00 |
| Yttrium | 20.00 | 3.68 | 3.70 | 5.00 | 6.80 | 8.50 |

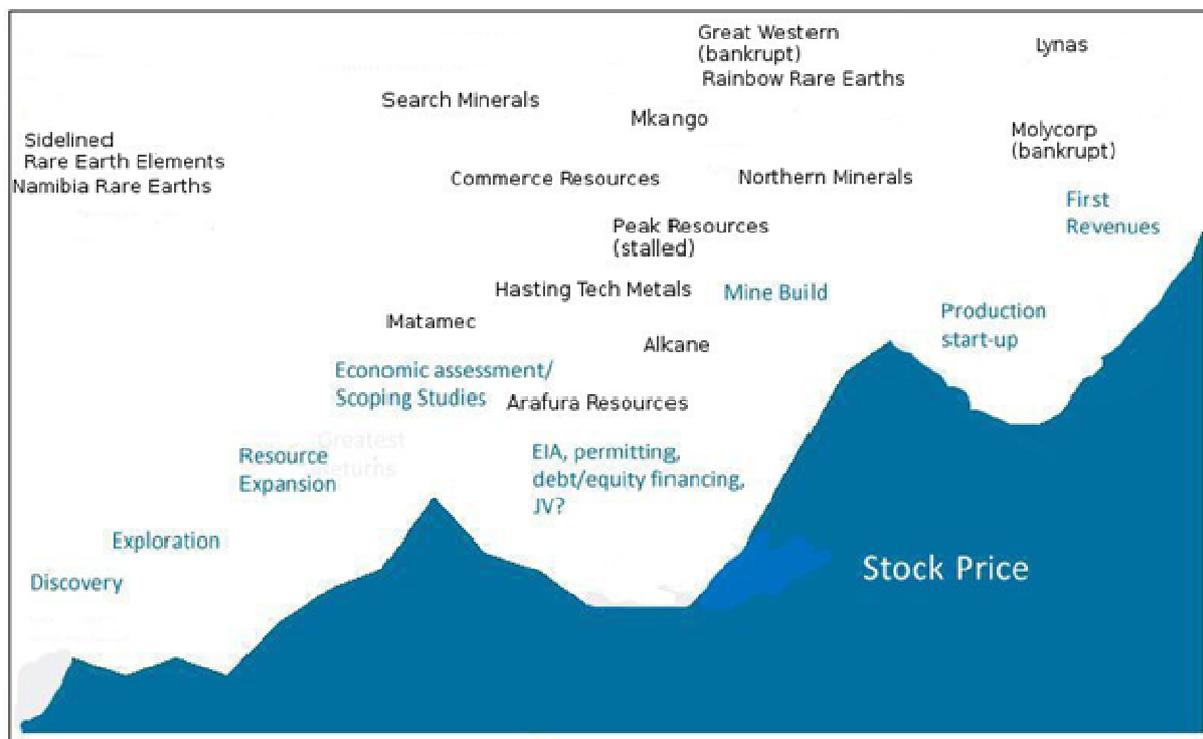
We remain bullish on virtually all the Rare Earths, except the ubiquitous Lanthanum and Cerium. These two really spoil the mix and the onset of production from Molycorp and Lynas, which both contained sizeable components of these two elements, made the price appreciation prospects for them look even grimmer and put the lid on many projects that are overly weighted towards these “mass-market” elements. They remain still the most prevalent REEs in all projects so other sources of production cannot help but add to the global overhang of these even if they are warehoused for some mythical better price scenario.

We believe that the most recent recovery in REE prices has not been accidental that in fact the Chinese have felt safe enough to tighten up the REE market and reset prices higher. Any tightening up by the Chinese indicates they want to sell at higher prices and they, of all players, are the ones best positioned to achieve that goal and ironically gain the most from it. The spin-off is that slightly higher prices will allow a few of the wannabes to move into the select producers’ club without spoiling the market.

The REE Lifecycle

Until recently one would have thought that the hardy band of REE survivors was somewhat fixed (or declining) but the addition of Rainbow Rare Earths to the picture added a slight flurry.

As our chart on the following page shows there are a lot of players in the middle of the field that have reached a certain point with mine plans and studies well-honed (even if overblown) that have little left to do than find a strategic partner and make the “rubber hit the road” with a construction timetable. That is easier said than done though.



Northern Minerals has sped from the “middle of the pack” to a commanding lead with a very large amount of material already mined and awaiting processing. Rainbow Rare Earths would have us believe that it will be in production by year-end but as this is to produce mineral concentrate without purification, hence selling at a large discount with a limited market, we are somewhat bemused as to how to define this as “production” as most of the value add for a Rare Earths project occurs downstream of the mineral concentrate stage. Their goal is to be producing 5,000 tpa of REE concentrate by the end of 2018. We shall see.

Our “lifecycle” chart for the first time has Mkango hot on the heels of the two putative producers. This puts it in the “final five”. Now it must deliver on a production timetable.

Malawi

The Republic of Malawi, is a landlocked country in southeast Africa that was formerly known as Nyasaland, when it was a British colony. It is bordered by Zambia to the northwest, Tanzania to the northeast, and Mozambique on the east, south and west. The country is separated from Tanzania and Mozambique by Lake Malawi. Malawi’s territory is over 118,000 km² (45,560 sq mi). Its capital is Lilongwe, which is also Malawi's largest city.

Malawi is among the world's least-developed countries. The economy is heavily based in agriculture, with a largely rural population, with little in the way of industry. A nascent mining sector could certainly help with job creation and trickledown effect, not to mention boosting exports and tax revenues.

The political system is a democratic, multi-party government, currently under the Presidential leadership of recently elected Peter Mutharika. The current constitution was put into place on 18 May 1995. The branches of the government consist of executive, legislative and judicial. The executive includes a president who is both chief of state and head of government, first and second vice presidents and a cabinet. The president is elected every five years, and the vice president is chosen by the president. Peter Mutharika came to power in May 2014.

Risks

The potential pitfalls with the Songwe Hills project might be:

- ✘ That the REE recovery is not sustained
- ✘ That financing for the development stage proves difficult to obtain
- ✘ Noble Group's future is still not defined
- ✘ Environmental concerns raise their head

The risks for Mkango are the standard risks of the REE sub-sector, with no exotica thrown in, as the company's project is not particularly challenging metallurgically or topographically. If anything it has a head-start on similarly profiled companies because of its stronger shareholder base.

Conclusion

The unfortunate travails of Peak Resources in Tanzania have made an opening for Mkango, the stealth performer in African Rare Earths to slip into what very well may be the "final five" in the push towards production in the REE space. The first REE boom resulted in two producers, Molycorp and Lynas of which only one survived. The second boom (of which we are only on the cusp) should produce another two or three additions, this time more 'right-sized' than the gargantuan projects of the first flush. Northern Minerals looks best positioned to be one of them. The question is whether Mkango might be one of the others to join the exclusive producer club.

There is another possibility though and that is that there will be no second boom, *per se*, but rather that the current phase of the REE cycle will be gradual reflation of prices (and demand) and that the gradual addition of new players will be required by the expanding EV. There may very well be no "boom and bust" this time as there are not enough players with projects sufficiently advanced to make for the same overcrowding we saw back in 2009-11.

Cleantech has become something of a hackneyed catchall term but two of its key (and real) elements are wind turbines and EVs. If REE demand projections had to rely upon wind demand alone then we would not be particularly excited. However the rising tide of EVs over the next 50 years should provide a quantum expansion in demand for magnet metals commensurate with increased Lithium demand and yet the paradox of enthusiasm for Lithium and the market's sanguine approach to REE sources of supply is becoming a serious disconnect.

Talaxis has now endorsed the strategy both with an initial capital injection and now rapidly following on with a commitment to fund the BFS, and find the financing for the project. Mkango has now managed,

in short order, to find a trader of Songwe’s product (in effect an offtaker), a funder for the BFS, a finder for the financing and a partner for the value-added technology part of the downstream process.

Mkango is proof to our theory on the 2010 REE “stars” that the “first shall be last and the last shall be first” as Mkango draws ahead of the onetime stellar stories that have fizzled and burnt, becoming Black Holes sucking in money and producing nothing of consequence. Mkango has always been outside the pack and is now reaping the benefits. We reiterate our view of Mkango as a **Long** opportunity with a twelve-month target price of GBP0.18.



Important disclosures

I, Christopher Ecclestone, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

Hallgarten's Equity Research rating system consists of LONG, SHORT and NEUTRAL recommendations. LONG suggests capital appreciation to our target price during the next twelve months, while SHORT suggests capital depreciation to our target price during the next twelve months. NEUTRAL denotes a stock that is not likely to provide outstanding performance in either direction during the next twelve months, or it is a stock that we do not wish to place a rating on at the present time. Information contained herein is based on sources that we believe to be reliable, but we do not guarantee their accuracy. Prices and opinions concerning the composition of market sectors included in this report reflect the judgments of this date and are subject to change without notice. This report is for information purposes only and is not intended as an offer to sell or as a solicitation to buy securities.

Hallgarten & Company or persons associated do not own securities of the securities described herein and may not make purchases or sales within one month, before or after, the publication of this report. Hallgarten policy does not permit any analyst to own shares in any company that he/she covers. Additional information is available upon request.

Hallgarten & Company acts as a strategic consultant to Mkango Resources and as such is compensated for those services, but does not hold any stock in the company not has the right to hold any stock in the future.

© 2017 Hallgarten & Company, LLC. All rights reserved.

Reprints of Hallgarten reports are prohibited without permission.

Web access at:

Research: www.hallgartenco.com

60 Madison Ave, 6th Floor, New York, NY, 10010