

# Market eyes Neo Performance Materials Constantine Karayannopoulos with, what's next?

written by InvestorNews | August 31, 2022

August is usually a slow time for business and news as it is the end of the summer holiday season in the Northern hemisphere, but this August has been a particularly busy time for [Neo Performance Materials Inc.](#)'s (TSX: NEO) management team, especially CEO Constantine Karayannopoulos.

Announcements have been coming fast and furious. Let's start with the most surprising news first:

- [Hastings Technology Metals acquires a 22.1% shareholding in Neo Performance Materials](#) – August 26, 2022

On August 26th [Hastings Technology Metals Ltd](#) (ASX: HAS) announced it was [acquiring a 22.1% shareholding](#) in Neo Performance Materials by buying out most of the position of Oaktree Capital Management, L.P. (Oaktree) fund OPPS NPM SARL. Oaktree will sell 8,974,127 shares at C\$15/share. Prior to this OPPS held 9,878,155 shares. The funding comes from Wyloo Metals, a private Australian metals company formed by Andrew "Twiggy" Forrest, whose worth is reported at US\$17.5 billion. Wyloo will invest the money into Hastings who in turn will acquire the shares from the Oaktree subsidiary.

- [Neo Performance Materials Announces \\$67.5 Million Bought Deal Treasury Offering of Common Shares](#) – August 26, 2022

On the same day as the announcement of the share acquisition by Hastings, a bought deal was announced with Paradigm Capital being the lead underwriter. The deal was done at \$15/share. At the time of writing, Neo Performance Materials was trading at \$14.25. There are over 40 million shares outstanding so after this deal, there will be 45 million shares. According to the press release the funds will be used for “general corporate purposes including the expansion, maintenance of global assets and the pursuit of strategic growth opportunities around the globe.” Expansion of the operations in Estonia is likely one area for the usage of the funds. Having visited the plant over a decade ago it is a Soviet era plant which runs nitric acid to separate the rare earths. Neo Performance Materials’ two plants in China use hydrochloric acid. The nitric route is high initial capex as every component is made from stainless steel but has lower opex than the Chinese approach. At a capacity of 3,000 TPY of rare earths oxides the Greenland deposit would produce 750 TPY of Nd/Pr or about 2,500 tonnes of magnets. A nominal size.

- [Second quarter results with records for revenue, Operating income and adjusted EBITDA](#) – August 12, 2022

This is due to the high prices for the four key magnetic elements, Neodymium, Praseodymium, Terbium and Dysprosium, which hit prices not seen in the past decade. Since then, Nd and Pr have dropped about 50%, Tb 20% and Dy 35%, which means it will be a challenge for Q3 results to match Q2 numbers.

- [Neo Secures \\$75 Million Loan to Finance Expansion and Relocation Of Its Environmental Emissions Catalyst Business](#) – August 17, 2022

This financing came from Export Development Canada (EDC). The

credit facility matures in 5 years and is available in 3 tranches of \$25 million. The funds will be used to relocate its rare earth plant in Zibo, Shandong province, China, to a nearby industrial park which will provide access to water treatment and waste/water recycling. This plant produces high value materials for automotive catalytic converters. The relocation is to expand capacity from 4,000 TPY REO to 5,000 TPY REO. Based on reported analysis for Baiyan Obo this expanded capacity will produce 370 tonnes of Nd/Pr oxide which would generate an additional 1,300 TPY of NdFeB magnets.

- [Hudson Resources and Neo Performance Materials Sign Agreement on The Sarfartog Rare Earth Element Project in Greenland](#) – August 22, 2022

This is an interesting move by Neo as they only tried to go upstream into mining once before when they got involved in a tin mine in Brazil over a decade ago. The development of this project would provide a source for their plant in Estonia which gets most of its raw material from Russia presently with the [balance from Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) in the USA. The deal is a non-refundable deposit of \$250k. Once the Greenland government gives approval for transfer of the license to Neo or its special purpose entity, Neo will pay Hudson Resources an additional \$3.25 million. There are two projects in the deal. One is an REE project in SW Greenland and a nearby Nb/Ta. Deposit. The Neo plant in Estonia also produces high purity Nb and Ta metal as well as rare earths so there is synergy in this deal. The 2011 43-101 report on the REE project showed an indicated resource of 5.9 million tonnes at 1.8% rare earth oxide which translate to about 100,000 of rare earth oxides. It is an underground mine opportunity which will bring added cost to the mining process. Should Neo proceed with this acquisition it will need to develop a camp onsite and decide

where to upgrade the ore prior to shipping a concentrate to Estonia – all challenges Canadian companies have dealt with for decades.

If Neo Performance Materials is an indicator for the rare earths sector, one can only wonder what's next.

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# MP Materials is riding the rare earths tonnes per year train

written by | August 31, 2022

[MP Materials Corp.](#) (NYSE: MP) emerged from the Chapter 11 of MolyCorp and is the only producing rare earths mine in the USA. At one time the in the 1990s it was producing upwards of 40% of the world's rare earths. MP has a current market cap of US\$5.6 billion, which puts it slightly ahead of [Lynas Rare Earths Ltd.](#) (ASX: LYC), which is the biggest producer of separated rare earths outside of China. Combined their market caps exceed the annual revenue of separated rare earths globally.

MP has made some interesting news this year. Q1 revenues of US\$166.3 million which is 50% of their revenues from all of 2021. This is due to the high pricing of Neodymium (Nd) and Praseodymium (Pr) in Q1 of this year. Based on Roskill's report of 2015, MP's content of NdPr is 16.3% of the total volume. This may vary a little but it is likely to be the two elements that set the pricing for their concentrate as the balance of the materials are of little value. Looking at a basket price, NdPr

will account for 93-94% of the total value, assuming all elements were sold which is doubtful as the Chinese have lots of the remaining elements, especially Cerium and Lanthanum. Gross margins in Q1 2022 were 88%, up from 81% in 2021, but I expect this will fall for the balance of the year as NdPr prices are now 20-25% lower than Q1 peaks. Either way, MP is poised to improve its Net Income to US\$168.4 million. MP has done a good job in their sales price to China for their concentrate. I calculate they are getting somewhere in the range of 40-50% of market value, which is high versus traditional pricing for concentrate which I have seen at 25-30%.

In April a definitive [supply agreement](#) was announced between MP Materials and GM to supply rare earth alloy and magnets for GM's EV program. This is significant as it would restore NdPr rare earth metal, alloy and magnet production. The USA does produce Samarium Cobalt magnets but these are typically used in military applications. There is no indication on what technology will be used to produce the metal, which in China is a messy process. Planned capacity is 1,000 metric tonnes of NdFeB magnets. This will require 280-300 tonnes of NdPr. The previous Molycorp plant was designed to produce 20,000 tonnes of REO of which NdPr would account for over 3,000 tonnes.

This does leave the question as to where MP will sell the remaining NdPr. Europe has one metal/alloy producer and one magnet producer, and Japan is the other logical market, but Lynas owns 80% of the Japanese market and has a shorter supply line. What is left is China. Also to supply other US car producers MP would have to expand capacity, and it is not clear what limits or exclusivity GM has with MP Materials.

The challenge is that the original plant was designed as a single train of 20,000 tonnes per year. Nowhere in China is there a single train much larger than 5,000 tonnes per year

(TPY). Lynas built four 5,500 TPY trains. This allows flexibility should there be issues like reduced demand during COVID where one or two trains can be shutdown to allow matching with demand, or if one train has operational issues. I would expect that MP, with the input from [Shenghe Resources](#) (a related party of MP whose ultimate parent is Shenghe Resources Holding Co., Ltd., a rare earth company listed on the Shanghai Stock Exchange, and as of its [March 31, 2022 quarterly report](#), a buyer of MP's rare earth concentrate that accounted for more than 90% of MP's product sales), will reconfigure the plant to be more flexible. Also MP, like anyone else, will not go from zero to 20,000 TPY overnight. There will be a qualification process and time to acquire accounts so multiple trains makes sense as one penetrates a market as they can be brought on as the business grows.

The other news was that the US Department of Defense (DOD) granted MP \$35 million to build a heavy rare earths at Mountain Pass. I find this interesting as Mt. Pass has 98.6% of its content in light rare earths. This would mean at a run rate of 20,000 TPY the total output of the heavy rare earths would be 280 TPY. The only real valuable heavy rare earths are Terbium (Tb) and Dysprosium (Dy) which would total about 10 TPY combined. At today's pricing, which for Tb is high, in my opinion, this plant would generate revenues of \$10-11 million per year.

Overall MP has been doing well – selling concentrate to China. What will happen to profits as they move downstream only time will tell.

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# June 2022 start for Vital Metals to produce mixed rare earth carbonates with feed from its own mines

written by InvestorNews | August 31, 2022

The rare earths sector has been doing very well lately, especially the highly valued magnet rare earths for which prices have [doubled over the past year](#). Neodymium (Nd) and praseodymium (Pr) are the key magnet rare earths used commonly in electric motors. They also fall into the category of the '[light rare earths](#)'. Another group of rare earths, known as the '[heavy rare earths](#)', also have value. They include europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and yttrium. [Dysprosium](#) (Dy) in particular is very valuable and is critically necessary for and used in alloys for neodymium based magnets subject to high temperature swings in operation.

Today's company is working towards becoming a North American producer of both light and heavy rare earths.

[Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) (Vital) is a rare earths ore producer from their Nechalacho Rare Earths Mine in the Northwest Territories (NWT), Canada. Nechalacho has a measured, indicated and inferred resource of [94.7Mt at 1.46% REO](#) for 1.3Mt contained TREO. The focus to date has been on the high-grade, light rare earths, found in the bastnaesite mineralization there.

Vital has off-take agreements with REEtec in Norway and with [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF) in the USA. In

both cases, Vital is working with them to develop a qualified feed stock for them end at commercial scale. In some good recent news, offtake buyer, [REEtec, signed a supply agreement with Germany's large OEM automotive supplier, Schaeffler](#), thereby potentially securing Vital's revenue from the sale of its product to REEtec.

Vital is currently constructing a Saskatoon, Saskatchewan, based cracking and leaching facility, with first feed to the facility expected [in June 2022](#). An additional [C\\$5 million of funding/reimbursement was recently achieved](#) to help support the commissioning and ramp-up stage. Vital aims to produce a minimum of 5,000 tons annually of contained REO by 2025 at the Nechalacho Mine.

Vital Metals' Managing Director Geoff Atkins [stated](#): "With production forecast to commence in June 2022, this will make Vital North America's only producer of high purity rare earth carbonate with feed from its own mines providing security of supply for the global rare earths supply chain."

### **Expansion into heavy rare earths**

As [announced](#) on April 29, 2022, Vital is now planning to expand their existing light rare earths mine operation to also include heavy rare earths. Vital plans to investigate developing a zone of xenotime mineralization, the principle heavy rare earth hard-rock mineral, at Nechalacho's North T pit, targeting a 10-year operation from the zone. [Xenotime](#), is an yttrium phosphate mineral, and is the only known commercially feasible hard-rock source of dysprosium and terbium, which are the critical magnet rare earth additives for high temperature operations. As Vital [stated](#): "Tardiff contains elevated heavy rare earths mineralization which may complement North T's xenotime deposit as part of Vital's strategy to produce heavy and light rare



earths.”

## **Next steps**

In 2022, in addition to commencing production at the Saskatoon facility and working on expanding into heavy rare earths, Vital plans further drilling at the Tardiff zone to define a maiden Ore Reserve.

**Vital Metals 3 stage strategy to become a North American producer of both light & heavy rare earths**



Source: [\*Vital Metals March 2022 quarterly report\*](#)

## **Closing remarks**

Vital Metals continues to march forward at a rapid pace. In [late June 2021](#) the Nechalacho mine came into production, notably being Canada’s first-ever producing rare earths mine. Then only a year later in June 2022, the Saskatoon cracking and leaching facility’s first production of a mixed rare earth carbonate is set to commence.

If that wasn’t good enough the Company is now planning to also produce heavy rare earths, also from the Nechalacho Mine. Once achieved Vital [announced](#) that they would become the “the world’s first producer of both heavy and light rare earth oxides.”

Vital Metals trades on a market cap of [A\\$204 million](#). Exciting times ahead.

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# Hunting the big North American rare earths elephant

written by Jack Lifton | August 31, 2022

*"Amazing discovery... I keep making this point that there is a deficit of rare earths worldwide and Appia is the premier rare earths discovery in North America."* – Jack Lifton, Global Critical Materials Expert

A mineral discovery is the natural occurrence of a specific chemical compound or a mix of chemical compounds, which may be processed mechanically and chemically to isolate one or more forms of individual chemical elements, and then be purified and converted into useful forms for industrial use. If the discovery is extensive enough and the contained chemical compounds are of a sufficiently high enough grade for efficient and economical separation of them from each other and then can be further processed into forms that can be utilized industrially, then the large-scale production and concentration of the initial mineral concentrate is called mining.

How do you evaluate a rare earth discovery? The best way is to determine if it contains "valuable" rare earth elements, which can be economically and efficiently recovered in the jurisdiction in which it is located, in such quantities that the capital expended can be recovered at a profit.

The old-timers (aka, experienced exploration geologists and mining engineers) have just two simple metrics they use in first determining whether or not there is any point in answering this question: Grade and accessible tonnage.

[Appia Rare Earths & Uranium Corp.](#)'s (CSE: API | OTCQB: APAAF) rare earth discovery at Alces Lake, Saskatchewan, meets the

first of the above requirements, and the company is now in the process of a comprehensive drill program to determine if the second one is met as well.

The Appia discovery is of the mixed rare earth mineral, monazite, the most desirable rare earth bearing mineral on the planet. Monazite was the original rare earth mineral mined commercially in the late nineteenth century, not for rare earths, but for its contained thorium, which was heated, as an oxide in the form of a mixed ceramic mantle, with natural gas, to produce a brilliant white light for illuminating the stage in theatrical performances. Monazite fell out of favor as a mineral resource after World War II because of thorium's natural radioactivity being highlighted as a danger in the early atomic age. Of course, electric lights, had by then long eclipsed the need for thorium.

In the 1950s though, thorium again became of interest when it was discovered that nuclear reactors for the commercial production of electricity could be fueled with thorium, which could not easily be used to make nuclear weapons. Anglo-American Mining in that period discovered the highest-grade thorium and rare earths deposit then known in the world in South Africa and began producing thorium for the UK's civilian nuclear reactor program. Thorium reactors fell out of favor by the mid 1960s and thorium (monazite) mines were shut down, even though they were associated with high grade rare earths, because of the problems of disposing of the thorium and the then extremely expensive processes for separating the rare earths from each other, ion exchange, and fractional crystallization.

The discovery of a huge primary, accessible, mineable deposit of the rare earth mineral bastnaesite at Mountain Pass, California, in the late 1940s, and the development in the 1960s of the commercial application of solvent extraction to the separation

of the rare earths, led to the eclipse of the use of high thorium monazites by bastnaesite as the primary mineral for rare earth mining.

The development of the rare earth permanent magnet in the late 1970s, at first using the rare earth element, samarium, and the rare earth elements neodymium and praseodymium, revived interest in monazite, because monazite contains 50% more, by weight, of neodymium and praseodymium, than bastnaesite.

However, the low thorium bastnaesite in California, because of its accessibility, became the world's largest source of the magnetic rare earths, samarium, neodymium and praseodymium by the early 1980s. It was eclipsed by the bastnaesite recovered, more economically, as a byproduct of iron mining in China's Inner Mongolia by the late 1980s. The Chinese iron deposits also contained some monazite, and this was processed there also to recover the rare earths. The thorium co-produced was stored, but its radioactivity ultimately led China to bring its control under the aegis of its China Nuclear Corporation (CNC), which stored it along with any other thorium produced as a byproduct of rare earths or its own uranium minerals processing.

Today, as Chinese bastnaesite grades seem to have declined from high grading and as pollution (environmental) consciousness has come of age in China, monazite, as a source of magnetic rare earths has revived dramatically in China. And China has become the world's largest processor of monazite. Chinese mining and processing companies already import nearly 40% of their rare earth ore needs annually. They get bastnaesite from California and CNC is licensed to process up to 50,000 tons per year of monazites containing up to 30,000 tons of rare earths. All monazite imported into China must first go to CNC for thorium and uranium removal, before it goes to the Chinese purchaser, which will then recover the rare earths contained. China buys

monazites as ore concentrates from the USA (until very recently), Brazil, Madagascar, Australia, and Myanmar, and Chinese companies are scouring the world seeking more.

The Chinese had the use of monazites as a source of magnetic rare earths to themselves until 2017, when Australia's [Lynas Rare Earths](#) (ASX: LYC) went into commercial production and separation of the individual rare earths from its massive monazite mine at Mt. Weld, Australia. Then, in 2020, the only privately owned licensed uranium ore processor and thorium storage facility in the USA, [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR), began a project to process monazite for its rare earths and to stockpile and sell the uranium recovered and store the thorium. Energy Fuels is and remains the sole such facility in the Americas. Its business plan is to become vertically integrated by building, on-site, a separation facility, and a rare earth metals and alloys operation also.

Energy Fuels has acquired domestically produced American monazite from the heavy mineral sands operations of The Chemours Company, and is actively seeking additional materials both domestically and internationally. Energy Fuels has already produced and sold commercial quantities of mixed rare earth carbonates cleaned of uranium and thorium.

Now, at last, we come to Appia and Canada's entry into the rare earths' mining and processing arena.

Australia's [Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) is now mining bastnaesite just outside of Yellowknife in Canada's Northwest Territory from a high-grade deposit discovered by [Avalon Advanced Materials Inc.](#) (TSX: AVL | OTCQB: AVLNF) and licensed to Vital. The ore concentrate will be first sent to an operation being built by the Saskatchewan Resource Council (SRC), a Crown Corporation, where the uranium and thorium will

be removed and a mixed rare earth carbonate produced for use in further downstream processing. The first such production has already been pre-sold to both American and European processing customers.

But the SRC has plans to construct not only a cracking, leaching, and radioactive recovery and storage system (Saskatchewan is Canada's largest uranium mining and processing province, so the business there is well established and understood), but also a rare earths separation system in the form of a dedicated solvent extraction facility, the first of its kind in Canada.

Now we come to Appia Rare Earths & Uranium Corp., a Canadian company, originally exploring for uranium in Saskatchewan's world-famous Athabasca Basin. About 5 years ago its then geologist discovered a dramatically high-grade sample of monazite on the company's Alces Lake Property in Saskatchewan. He soon found that the sample had come from an outcrop showing extensive monazite veining. He continued to explore the area and predicted that the monazite field was extensive. Analysis of samples he took showed that it was also the highest grade neodymium rich monazite ever found in North America.

I was a speaker that year at a Metal Events' Rare Earth Conference in Henderson, Nevada, and the Appia geologist, James Sykes, was an attendee. I had never met him, but we shared a cab to the airport, and he excitedly told me the Alces lake, monazite, story. I was intrigued, but I had reservations about the thorium and uranium that would be present in such a high-grade material. I thought of the highest grade rare earths deposit ever worked, Steencompskraal, in South Africa, which was actually worked as a thorium mine with no interest (in the 1960s) in the rare earths contained. I didn't then know of the monazite project in China or CNC's role in it. I listened

politely to Mr Sykes and wondered what anyone would do with this discovery if it were confirmed to be extensive enough to qualify as a NI 43-101 resource.

Did I mention that James Sykes also said that he believed the extended discovery to be near surface, so that a quarrying operation would obviate the need for underground operations?

It is now the Spring of 2022, and Appia has raised approximately \$15.5 million in the last year. This funding is for a [drilling program](#) which is underway to prove a resource.

Energy Fuels is processing monazite, the Saskatchewan Resource Council has approved \$31 million to acquire monazite, and other rare earth ore concentrates, and build a first of its kind in Canada cracking and leaching and separation facility dedicated to rare earths, and Canada's [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF) has begun construction of a Strategic Metals Center in Alaska for the central processing of critical metals, beginning with rare earth mixed carbonates from a variety of sources including Canadian and Australian monazites.

Appia's drilling results so far are very encouraging, and have been extensively reported.

I think we may see the highest grade neodymium-rich monazite in the America's flow from Alces lake before 2025. If so, It will certainly be in high demand.

Did I mention that the Appia monazite discovery contains 1% of xenotime, the hard rock mineral source of yttrium, dysprosium, and terbium? A one-stop-shop for magnet makers?

The stars and this planet are coming into alignment for this one. Monazite is back.

*Disclosure: Jack Lifton is a member of Appia Rare Earths &*

*Uranium Corp.'s Advisory Board and the Advisory Board for Energy Fuels Inc., and may hold securities or options in some of the companies mentioned in the above article.*

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# **Search Minerals moving forward with growing rare earths resource, new PEA and a commercial magnetic separation plant**

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It has recently been reported that the U.S. Government (subject to approval of [the proposal](#)) is likely to widen their definition of “domestic source” in the Defense Production Act to include the United Kingdom of Great Britain and Northern Ireland and Australia. This is in addition to the current inclusion of Canada and of course the USA. If passed, this is great news for critical material miners located in these countries.

One such company is focused on the high value magnet rare earths and is advancing their project in Canada. Magnet rare earths prices, such as neodymium, [have increased very significantly](#) over the past year as EV demand surged.

[Search Minerals Inc.](#) (TSXV: SMY | OTCQB: SHCMF) (Search) is developing their rare earths projects in Labrador, Canada. Their three projects include:



- The Port Hope Simpson (PHS) Property (flagship) – Includes Foxtrot, Deep Fox, Silver Fox, Awesome Fox, and Fox Meadow deposits. Prospective for Neodymium (Nd), Praseodymium (Pr), Dysprosium (Dy), and Terbium (Tb), as well as Zirconium (Zr) and Hafnium (Hf). The updated 2022 PEA is due soon in Q2, 2022.
- The Henley Harbour Area in Southern Labrador.
- The Red Wine Complex located in Central Labrador.

### **Search Minerals PHS Property showing the Foxtrot & Deep Fox deposits and other targets**



Source: [Search Minerals website](#)

Search's flagship PHS Property has been the Company's focus with a [PEA completed in 2016](#) on Foxtrot only, an updated Resource recently released (now includes both Foxtrot & Deep Fox), and an updated PEA to follow very soon. Given the larger resource (hence potentially longer mine life) and higher rare earth prices, the upcoming 2022 PEA is expected to potentially improve significantly on the 2016 PEA. Search President & CEO Greg Andrews, discusses the positive impact on their upcoming PEA in a recent InvestorIntel video [here](#).

### **Details of the updated resource at Foxtrot and Deep Fox**

As a result of the recent [updated resource](#) news the Foxtrot resource has grown by approximately 60% from the 2016 estimate and the Deep Fox resource has grown by 25% from the 2019 estimate. Search state in their April 11, 2022 resource [announcement](#): "Revenue attributable to Pr, Nd, Dy, and Tb represent approximately 92% of the total revenue."

### **Estimated Mineral Resources for the FOXTROT and DEEP FOX Projects as of December 31, 2021**



Source: [Search Minerals announcement on April 11, 2022](#)

Both Foxtrot and Deep Fox Resources include open pit (OP) and underground (UG) components as shown on the models below. They will form the basis of the upcoming updated 2022 PEA. In both cases, mineralization remains open at depth.

### **Models showing the open pit and underground resource at Foxtrot and Deep Fox**



Source: [Search Minerals announcement on April 11, 2022](#)

### **Next steps (including steps towards a full commercial magnetic separation plant)**

The next steps for Search at their PHS Property will be the 2022 PEA release, further drilling to grow the resource (including at Fox Meadow), and further advancements with off-take agreements. In 2021 Search signed a [non-binding MOU](#) with USA Rare Earth LLC for the future delivery of a rare earth mineral concentrate supply containing 500 tpa of NdPr. The MOU also included a plan to expand the collaboration to include discussions regarding separation, marketing, and offtake of a portion of the future production at Search's Deep Fox and Foxtrot deposits. There will also be the upcoming results from Search's [magnetic separation program](#) using bulk samples from the PHS Property (Foxtrot & Deep Fox). The results of the testing will be used as part of a 'scale up' to a full commercial magnetic separation plant.

Search President & CEO, Greg Andrews, [states](#): "We continue with our "Sprint to Production" and this is a very important step to scale up and produce more material for further separation into individual oxides of the permanent magnet material, Neodymium

(Nd), Praseodymium (Pr), Dysprosium (Dy) and Terbium (Tb). These are the key elements which create the value in the rare earth element supply chain. Upon producing the oxides, Search will demonstrate the transformation of the permanent magnet oxides into metal.”

### **Closing remarks**

Last month Search released a significant Resource upgrade at Foxtrot and Deep Fox deposits on their PHS Property. The results were strong growing the resources by 60% and 25% respectively. Both remain open at depth and the PHS Property has numerous other exciting rare earth targets such as Silver Fox, Awesome Fox, and Fox Meadow. This means the PHS Property should potentially continue to further grow the total resource size in years to come. Search did recently release [encouraging assay results](#) at the Fox Meadow target where Search plans to commence a 6,000 m drill program this fall.

The big next catalyst for Search is the upcoming updated 2022 PEA which should potentially see a significant improvement on the 2016 PEA. Following that it will be interesting to see Search’s progress towards becoming a rare earths miner as well as processor.

Search Minerals trades on a market cap of [C\\$65 million](#).

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# **Ucore targets to fill the**

# processing gap in a Western rare earths supply chain by 2024

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As most investors familiar with the critical materials sector know, China currently dominates the space, especially in downstream critical materials 'processing'. This leaves the Western world very vulnerable to supply chain interruptions that can threaten the supply of end-user products such as electrical and electronic components, electric vehicles, wind turbines, solar panels, and/or military systems.

Today's company, [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF) (Ucore), is working to bridge that gap, domestically, and become a USA 'processor' first of the rare earths, and ultimately of other key critical materials. They also plan to be a vertically integrated individual, separated, heavy rare earths producer.

Ucore is focused on initially developing an Alaska-based Strategic Metals Complex (SMC) rare earths' central processing facility with commissioning targeted for 2024. After that Ucore plans to develop its own magnet rare earths' deposit located on Bokan Mountain on Prince of Wales Island, Alaska. The ultimate plan for Ucore is to have their Bokan-Dotson Ridge REE Project – containing the heavy rare earths' Dysprosium (Dy), Terbium (Tb) & Yttrium (Y) – feed their first, Alaska located, SMC processing facility. The underlying technology for this and other planned SMCs is the RapidSX™ REE separation technology platform, which will be operated by Ucore's wholly owned subsidiary, Innovation Metals Corp. (IMC).

## **Ucore plans to fill the processing gap in creation of a Western rare earths supply chain with their SMC facilities**



Source: [Ucore news January 2022](#)

A key part of getting the Alaskan SMC processing facility up and running is to secure material supply agreements. The facility will have an initial 2,000 tpa total rare earth oxide (TREO) separation and purification capacity, ramping to at least 5,000t/year TREO by 2026.

### **Feedstock agreements are progressing well for Ucore's planned Alaskan SMC processing facility**

[In October 2021](#) Ucore signed a non-binding Memorandum of Understanding (MOU) with [Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) for the supply of a mixed rare earth carbonate, beginning H1 2024. The deal is for "Vital to sell to Ucore a minimum of 500t REO (ex-cerium)/year, commencing H1 2024. Vital to expand production to support a minimum of 50% of Ucore's envisioned 5,000t TREO/yr processing capability by 2026."

It also was [announced last week on April 20, 2022](#), that Ucore and Germany's ThyssenKrupp Materials Trading had executed a feedstock supply MOU for the Alaska SMC. Under the MOU "ThyssenKrupp Materials Trading is expected to begin the supply of a minimum of 1,000 tpa of mixed rare earth carbonate to Ucore in 2024 for ten years." The announcement also states that the non-binding MOU allows for increasing quantities in subsequent years and that the two parties will work towards a 10-year binding contract.

The above MOU is a great achievement and positive endorsement for Ucore, as ThyssenKrupp Materials Services is [the biggest](#)

[mill-independent materials distributor](#) and services provider in the Western world with around 380 locations, in more than 30 countries.

The loud and clear message for investors is that Ucore is putting together a North American individual rare earths supply chain from mixed rare earths carbonate (concentrate) all the way to the final product of separated individual rare earth oxides, used to make rare earth metal alloys (including magnets) such as those required for many critical and green energy products. It will be a key initial step for the USA to gain rare earths processing independence from China, which currently dominates the sector.

### **Ucore is also developing processing technology for other critical metals in Ontario**

As [announced](#) on April 19, 2022 Ucore is improving the management and technical team for their Ontario RapidSX™ Commercialization and Development Facility (CDF). The demonstration plant construction is ongoing and is scheduled for commissioning in mid-2022.

What I find most interesting is that Ucore is also working on nickel laterite ore processing technologies as well as lithium-ion battery recycling, including working with clients such as Li-Cycle Holdings Corp.

Full details on Ucore's 2022 plans can be read [here](#) and include:

- A commercial demonstration plant for their RapidSX™ technology in Ontario.
- Development of the Alaska SMC Project.
- Exploring the potential of developing an SMC in Canada.
- Accelerating the development of the Bokan Project as a vital US supply chain component to provide a long-term

secure source of HREEs; the most expensive and scarce inputs of the permanent magnet alloys.

**Ucore's business summary – Includes a target for construction of the Alaska SMC by 2023, subject to finance**



Source: [Ucore Rare Metals Inc. website – Alaska 2023](#)

### **Closing remarks**

The Western world needs to develop its own complete end-to-end supply chains for critical strategic metals. In the case of rare earths, Ucore is advancing well and steadily moving towards becoming a U.S. individual separated rare earths producer by 2024, all going to plan. Of course, investors should remember these dates are the best guide from the company only and are subject to variables such as successful funding.

Ucore Rare Metals Inc. trades on a market cap of [C\\$37 million](#). Ucore still has a long way to go with several hurdles and risks ahead, partially explaining the very low market cap. Still, if they succeed the potential reward could be significant.

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## **Leading rare earths junior Appia adds a new uranium claim block to their expanding asset**

# portfolio

written by InvestorNews | August 31, 2022

Two of the best-performing commodities in the past year have been the key rare earth magnet material blend, neodymium, praseodymium (NdPr), and the energy metal, uranium. Today's company has established itself as a leading rare earths junior in Canada, but recently [changed its name](#) and expanded its uranium portfolio. This means investors get exposure to both the key magnet rare earths and also uranium. Even better, it controls 3 projects/properties.

The Company is [Appia Rare Earths & Uranium Corp.](#) (CSE: API | OTCQB: APAAF) (Appia) formerly known as Appia Energy, with its Alces Lake rare earths project and its newly acquired uranium mineral claim block (Otherside), as well as other uranium properties located in Northern Saskatchewan, Canada, and its Elliot Lake uranium and rare earths property in Ontario, Canada.

## **Appia's very high-grade rare earths project at Alces Lake**

For background on Appia's rare earths projects you can read some past articles [here](#) which focus on Appia's tremendous asset at Alces Lake, Canada which has the 2nd highest average rare earth's grade in the world, at [16.65 wt% TREO](#). High-grade zones are up to 49 wt% TREO. The rare earths are hosted in favorable 'monazite' ore at or near surface spread over 27sq km of tenements. There is a [23-25%](#) Critical Rare Earth Oxide (CREO) component, including neodymium (Nd), praseodymium (Pr), dysprosium (Dy), and terbium (Tb).

**Appia's 100% owned Alces Lake Project has the world's second highest average grade of TREO**





Source: [Company presentation](#)

Appia has access to use the Government funded Saskatchewan Research Council (SRC) processing facility in Saskatoon, Canada. Existing pilot facilities there (1,000 tpa capacity) have already optimized a monazite processing flow sheet for Appia. The SRC production-scale processing facility is expected to be partially operational in early 2023.

Appia plans a smaller surface and near-surface operation to start production with an open-pit scenario which is easier to permit and manage and should have a low CapEx/Opex.

Appia's latest results include:

- Drill results at Wilson North (Alces Lake) with [average 17.5 wt% TREO over 9.38 metres](#) with up to 37.9 wt% TREO.
- [High grade REE mineralization](#) identified over an estimated 27 square kilometre area. Channel sample of 14.71 wt % TREO from Sweet Chili Heat and 11.94 wt % TREO from Diablo. 10.35 wt % TREO returned from grab sample at Zesty. 7.86 wt % TREO returned from grab sample along the Oldman River trend. New discovery of REEs with 2.27 wt % TREO grab sample from "Train Domain". Elevated critical electronics metal, Gallium, values have also been returned for all samples enriched in TREO.
- Promising Results from Initial Metallurgical Tests on a Composite Sample from Alces Lake. Laboratory heavy liquid separation tests recovered 95% of the total rare earth oxide (TREO). Appia President Frederick Kozak [stated](#): "TREO recoveries and the percentage of TREO in concentrate are comparable to other producing global rare earths projects, supporting the potential for Alces Lake as a future monazite rare earths supply."

Appia is waiting on further drilling core and channel sample

assay results from the 2021 program. In terms of major near-term catalysts, Appia [states](#): “Analysis of 2021 drilling and assays may lead to NI 43-101 report early 2022.”

## **Saskatchewan Uranium Properties**

Appia recently [announced](#) that they significantly increased their uranium claims by acquiring the Otherside claim block of 27,291 contiguous hectares. Appia [states](#): “The claims were staked on the basis of similar geological and geophysical signatures to the Company’s Loranger property as well as other known high-grade, large-tonnage uranium deposits in the Athabasca Basin including Fission Uranium Corp’s Triple R deposit, NexGen Energy’s Arrow deposits and others.”

Appia now owns 4 uranium properties/claims over a total of 69,344 hectares – Loranger, North Wollaston, Eastside, and Otherside. The properties are well located with proximity to infrastructure such as roads, highway, powerline, an airstrip as well as two uranium mills. The properties are ready to explore, with at or near-surface high-grade uranium, no sandstone cover, and negligible overburden.

## **Saskatchewan Uranium Properties – Loranger, North Wollaston, Eastside, and Otherside**



Source: [Company news January 10, 2022](#)

Appia [stated](#) on January 10, 2022 that the next steps are: “Appia has commenced the permitting process for a winter drilling program on the Loranger property and anticipates commencement of drilling in approximately one month, depending on weather and permits. The Company is fully funded for this program.”

## **Elliot Lake (Ontario, Canada)**

Appia also has a 100% interest in 12,545 hectares (31,000 acres), with rare earth element and uranium deposits over five mineralized zones in the Elliot Lake Camp, Ontario. The Resource details are shown in the table below.



Source: [Company presentation](#)

### Closing remarks

Appia is becoming a significant rare earths and uranium junior. Appia now owns three very promising projects – Alces Lake (very high grade and critical rare earths), Saskatchewan Uranium Properties (Loranger, North Wollaston, Eastside, and Otherside), and Elliot Lake (rare earths & uranium).

Appia trades on a market cap of [C\\$54 million](#).

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# Hastings Technology Metals secures Australian Government Funding for Yangibana, World's Richest NdPr Deposit

written by InvestorNews | August 31, 2022

Many are now asking will [Hastings Technology Metals Ltd.](#) (ASX: HAS) (“Hastings”) be Australia’s next rare earths producer?

The answer is ‘maybe yes’ after the Company [announced](#) on February 2, 2022: “NAIF approves \$140 million loan for Yangibana

Rare Earths Project.....NAIF loan forms part of A\$300-400 million of total debt financing required for Yangibana.”

Yangibana is the first Australian rare earths project to receive NAIF funding. The above mentioned Northern Australia Infrastructure Facility (NAIF) loan has a 12½-year tenure and is subject to pre-completion conditions.

Hastings [stated](#): “Yangibana early works construction and design for long-lead items underway in anticipation of plant construction commencing in September 2022 Quarter.” The NAIF loan first drawdown is expected to occur in early 2023, aligned to the Yangibana funding schedule.

Hastings [states](#) about its planned project: “The Yangibana project, which comprises a mine and beneficiation plant at the Yangibana site and a hydrometallurgical plant at the Ashburton North Strategic Industrial Area (ANSIA) near Onslow, will become Australia’s second rare earths producer and expands the country’s strategic capability in downstream processing of rare earths minerals.”

### **More about Hastings Technology Metals Ltd.**

Hastings controls two rare earth projects in Western Australia. They are the [Yangibana](#) and [Brockman](#) Projects. The more advanced Yangibana Project contains a predominance of neodymium, praseodymium, dysprosium and europium.

### **The Yangibana Project (mine, beneficiation plant, and hydrometallurgical plant) – Western Australia**

Hastings [state](#): “Yangibana has the world’s highest composition of neodymium and praseodymium and is located in the Tier 1 mining jurisdiction in Western Australia.” The significance here is that neodymium and praseodymium (NdPr) are the highly valued

magnet metals.

The Yangibana Project [Proven & Probable Reserve](#) is 16.7Mt at 0.95% TREO (0.35% NdPr oxide) for a total contained 158,419 t TREO. The Total Mineral Resource has a contained TREO of 266,417 t (at 0.97% TREO).

**Yangibana Project has great metrics – Has a 37% NdPr content – double the world average**



Source: [Company presentation](#)

The Yangibana Project's CapEx is estimated at [A\\$516 million](#) (A\$67 million contingency) but is currently being revised. The Project's November 2019 NPV was [A\\$549 million](#) (IRR 21.1%). NdPr prices have increased significantly since then, so updated Project economics are expected soon.

The Yangibana Project is planned to have a [1.2Mtpa ore throughput](#), a 15 year mine life, ~15,000 tpa of MREC production, ~8,500 tpa TREO production and [3,400tpa NdPr](#) production. Commissioning is targeted for 2024, subject to final project funding.

**Hastings' Yangibana Rare Earths Project and their planned Onslow hydromet plant in Western Australia**



Source: [Company presentation](#)

Hastings has commenced early site works at Yangibana (Mining Proposal [has been approved](#)) and recently received Commonwealth environmental approvals to develop the hydrometallurgical plant site at ANSIA near Onslow. Subject to funding, Hastings intends

to then commence construction of the beneficiation plant and the hydrometallurgical plant.

On February 2, 2022, Hastings Executive Chairman Charles Lew, [stated](#)

“The commitment by NAIF will enable Hastings to finalise the funding requirements for Yangibana’s development and move into full-scale construction throughout 2022, with the objective of delivering first production by 2024. Yangibana is an amazing, rare earths, opportunity that will supply the world’s highest composition neodymium and praseodymium concentrate to Tier 1 customers in Europe and Asia. This is an exciting time not just for Hastings but for Australia’s emerging rare earths sector. We look forward to finalizing the funding arrangements that will enable the Hastings’ Board to make a final investment decision in the coming months.”

**Hastings Technology Metals investment highlights (as of November 25, 2021)**



Source: [Company presentation](#)

Note: The 52% NdPr to TREO ratio refers to the highest-grade deposit within Yangibana called Simon’s Find, which contains [52%](#) of rare earths as NdPr. It potentially provides strong early cash flows to the Project.

### **Closing remarks**

Hastings Technology Metals certainly looks well on the way to becoming Australia’s next rare earths producer, and only the second one following on from the very successful [Lynas Rare Earths Limited](#) (ASX: LYC) (market cap [~A\\$8 billion](#)).

Hastings ticks all the right boxes in terms of a great resource, high NdPr content, location, integrated project, off-take contracts signed, and now is getting closer to achieving project funding ([awaiting final credit-approved commitments](#) from lenders' consortium) with only [minor regulatory approvals remaining](#). Executive Chairman Charles Lew owns 7.1% of the Company so that is also a great endorsement.

All going well Hastings could begin Yangibana Project construction in 2022 ([September Quarter 2022](#)) and commercial production in 2024. Hastings Technology Metals trades on a market cap of [A\\$516 million](#) and looks set to have a very big 2022.

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# Search Minerals is coming off a great 2021 but 2022 promises to be even better

written by InvestorNews | August 31, 2022

[Search Minerals Inc.](#) (TSXV: SMY | OTCQB: SHCMF) (Search) stock price rose an impressive [223%](#) in 2021 and looks set for another strong year in 2022.

## Search Minerals 2021 in review

There were several reasons for the rise including positive sentiment towards the rare earths miners, particularly those with projects containing the valuable magnet metals Neodymium (Nd), Praseodymium (Pr) and Dysprosium (Dy) used in powerful electric motors. All three rare earth metals prices have been

rising strongly the past year on the back of surging demand from electric vehicle manufacturers as we saw EV sales rise about 100% in 2021. Search's flagship Port Hope Simpson ("PHS") property has many key rare earth elements including Nd, Pr, Dy, and Tb (Terbium).

Another key factor for Search's success in 2021 was that management delivered strong progress. This included a [non-binding MOU](#) with USA Rare Earth LLC for the future delivery of a rare earth mineral concentrate supply containing 500 tpa of NdPr. The MOU is part of a joint development plan to expand the collaboration to include discussions regarding separation, marketing and offtake of a portion of the future production at Search's Deep Fox and Foxtrot deposits. During 2021 Search was able [to purchase back a 2.5% Net Smelter Royalty \(NSR\)](#) from B&A Minerals Limited in return for 15 million common shares of Search Minerals, leaving just an outstanding royalty now of 0.5%. Other progress in 2021 included a successful 7,000m drilling program completed at Deep Fox as well as several successful capital raises including the most recent [C\\$15 million](#) and [C\\$5.3 million](#) equity raises. This leaves Search very well-funded to advance its plans in 2022.

**Search Minerals has district scale rare earth deposits at Port Hope Simpson (PHS) property (flagship) (includes Foxtrot, Deep Fox, Silver Fox, Awesome Fox, and Fox Meadow deposits)**



Source: [Search Minerals company presentation](#)

### **Search Minerals in 2022 and beyond**

Q1 2022 should see Search deliver an updated Preliminary Economic Assessment ("PEA") for the combined Deep Fox and Foxtrot deposits at their PHS Property. It is anticipated that



this will potentially be a very significant improvement of the [2016 PEA](#), which only included the Foxtrot deposit. It resulted in a post-tax [NPV10% of C\\$48 million](#) and post-tax IRR of 16.7% over a 14 year mine life. The initial CapEx was [C\\$152 million](#), and a further C\$57 million in year 8 for the underground stage of the Project.

Search [quotes](#) some of the reasons why the 2022 PEA should be better:

- Increase production rate from 1000 tonnes per day to 2000 tonnes per day
- Increase recoveries from optimized pilot plant process
- Increase revenue from higher grades at Deep Fox
- Extend mine life with material from both Deep Fox and Foxtrot for a central processing facility
- Decrease costs with reduced capital and operating costs
- Upward trending price escalations for permanent magnet material.

In Q2, 2022, Search plans to submit an updated Environmental Impact statement based on the updated PEA.

In Q3 and Q4, 2022 Search will continue to drill Deep Fox to potentially further grow the Resource as well as drill Fox Meadow and Silver Fox and commence a Bankable Feasibility Study (BFS).

All going well Search hopes to make a Final Investment Decision (FID) in 2023 and commence production in 2025.

### **Search Minerals 2022 catalysts**



Source: [Search Minerals company presentation](#)

## More about Search Minerals

Search Minerals Inc. is an emerging rare earths developer with three properties in Labrador, Canada. The three are:

- The Port Hope Simpson (“PHS”) property (flagship) – Includes Foxtrot, Deep Fox, Silver Fox, Awesome Fox, and Fox Meadow deposits. PEA due in Q1 2022.
- The Henley Harbour Area in Southern Labrador.
- The Red Wine Complex located in Central Labrador.

## Closing remarks

Search Minerals is coming off a great 2021 but 2022 promises to be even better. Certainly, it looks like Search can deliver an impressive 2022 PEA at PHS, given that the project economics will have potentially improved significantly. The PHS Project also has significant exploration upside and potential to further grow the Resource in 2022.

Search Minerals trades on a market cap of [C\\$74 million](#). The next 3-4 years could be game changing for Search Minerals, if they can make it to production in 2025, or 2026.

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# All Eyes on Australia in 2022 as a Global Rare Earths Production Leader

written by InvestorNews | August 31, 2022

The rare earths sector, particularly the rare earth magnet

metals (such as neodymium (Nd)), had a great 2021; but given that the electric vehicle (EV) and clean energy booms are just getting started, 2022 should be another strong year. The most powerful electric motor magnets used today are known as permanent magnets, and they typically are made of neodymium iron boron (NdFeB). Dysprosium (Dy) and praseodymium (Pr) are also commonly [used](#) in permanent magnets.

As shown below, neodymium prices had a very strong 2021 reflecting a very strong demand for permanent magnets used in powerful electric motors. It is interesting to note the correlations of price and EV car sales from the chart below especially when considering that the peak months for global electric car sales in 2021 were [March](#), [June](#), [October](#), [November](#), and most likely December (usually the best month of the year).

If you think electric car sales will boom again in 2022 and throughout the decade (as I do), then there is a strong case for owning the rare earth miners of these key magnet metals.

**Neodymium 1 year price chart – Currently at CNY 1,110,000/t (USD 174,134/t)**



Source: [Trading Economics](#) (red arrows by the author to show peak e-car sales months in 2021)

### **Where is the opportunity in rare earths?**

Most [rare earths reserves](#) are found in China, followed by Vietnam, Brazil, Russia, India, Australia and the USA. Canada also has some rare earths. Most of the global [rare earths production](#) is from China followed by USA and Australia.

For Western investors, the two largest rare earths producing mines are owned by Lynas Rare Earths Limited (ASX: LYC) and MP

Materials Corp. (NYSE: MP). A third smaller producer is [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR), which, however, is a processor, not a rare earth miner.

For investors looking at the next potential rare earths producer then best to look to Australia and Canada. Today I will focus on Australia.

## **Australian rare earth miners**

### **Lynas Rare Earths Limited (ASX: LYC) (Lynas)**

Lynas is the second largest NdPr producer in the world. Lynas owns the Mt Weld rare earth mine and Concentration Plant in Western Australia (WA), one of the world's highest grade rare earths mines. Lynas ships concentrate from WA to their Malaysian plant for separating and processing into commercial rare earths' materials. As part of their 2025 plan, Lynas is progressing their new Kalgoorlie Rare Earths Processing Facility in WA as well as their LRE/HRE separation & specialty materials facility in the USA.

Boosted by strong prices and production ([5,461t of NdPr](#) in FY 2021), Lynas reported [record sales of A\\$498 million and a record profit of A\\$157 million](#) in FY 2021. I would expect this to continue in 2022.

Lynas is no longer cheap and trades on a market cap of [A\\$9.69 billion](#), and a 2022 PE of [24.9](#). A top tier Western rare earths (NdPr) producer.

### **Australian Strategic Materials Limited (ASX: ASM) (ASM)**

Australian Strategic Materials is an emerging integrated producer of critical metals for advanced and clean technologies based in Australia and South Korea. ASM plans a "mine to metal" strategy to extract, refine and manufacture high-purity metals

and alloys that they can then supply directly to global manufacturers. ASM plans to produce a range of high-purity metals, alloys and powders from their metals plant in South Korea. Products will include titanium, zirconium and rare earths, required for permanent magnet production with the raw materials initially sourced from the market. The plan is to later source some materials internally, notably from their flagship Dubbo Project.

The Dubbo Project deposit contains rare earths, zirconium, niobium and hafnium. The Dubbo Project is ready for construction, subject to financing. In December 2021 ASM announced an updated base case in which the 20-year life of mine is expected to achieve a [pre-tax NPV of A\\$2,361 million](#) and a pre-tax project internal rate of return of 23.5%.

In November ASM [announced](#) the commissioning of their Korean Metals Plant in Ochang Province, South Korea. In December ASM [announced](#) they had formed a JV with Resource Corporation (KOMIR) (formerly known as Korean Resources Corporation (KORES)) to enable the supply of critical minerals and metals into Korea.

Korea is a tech-based manufacturing powerhouse, and this JV is very timely as non-Chinese tech manufacturers try to wean themselves from dependence on China-centric supply chains.

ASM trades on a market cap of [A\\$1.34 billion](#).

### **Arafura Resources NL (ASX: ARU) (Arafura)**

Arafura own the shovel ready Nolans rare earths (NdPr) Project in the Northern Territory of Australia. Arafura is aiming to be a trusted global leader for sustainably mined and processed rare earth products and plans to mine and process ore to separated commercial oxides at a single site at their Nolans Project. The main focus being to produce NdPr oxide. The Project has [all](#)

Federal & NT Environmental approvals secured and Government and Minister support for [A\\$300 million](#) senior debt facility. Basically, the Project is ready to go subject to final project funding being secured. Subject to that funding, first production is targeted to begin [late 2024](#).

Arafura trades on a market cap of [A\\$333 million](#).

An interesting side note to end on is that Arafura quote:

- “EV market growth is exponential: 10 to 40 times in the next 20 years. This will require 6–15 times more rare earth elements.
- Most EVs need about 1kg of rare earths for their motor magnets.
- Just 0.05% of the vehicle cost: but it can’t run without it.
- Market analysts forecast a supply gap that represents 109% of global supply today and is in excess of 11 Nolans Projects.”

Source: [Arafura Resources October 2021 company presentation](#)

## **Closing remarks**

We should remember that in 2021 the Morrison led Australian Government [announced a A\\$2 billion loan facility](#) for Australian critical minerals projects. These funds have the potential to help Australian rare earths juniors to move towards production.

Combine this with high magnet rare earths prices and surging demand, and we have all the ingredients for a strong 2022 from the Australian rare earths’ miners.