

Imperial Mining Group's Scandium-REE Preliminary Economic Assessment by the numbers

written by InvestorNews | June 22, 2022

Last week [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) released the results of a [Preliminary Economic Assessment](#) (PEA). The [results are impressive](#) with a projected 25-year mine life for its Crater Lake TG Zone Scandium-Rare Earth Element (Sc-REE) deposit 200 km NE of Schefferville, Quebec. Of particular note is Imperial Mining's CEO Peter Cashin, who has been in mining for decades and has been involved in rare earths and scandium for over a decade which puts him in a strong position to understand the idiosyncrasies of these critical materials.

Scandium is an element that has huge potential in automotive, aerospace, military, and applications where weight is critical without sacrificing other properties. Scandium has the ability, when added in < 1% levels to aluminum, to produce a metal that is one-third the weight of steel but has the strength of steel. The main scandium production is in China and Russia, and major companies are looking for a reliable, long-term supply from a favorable jurisdiction before committing to a design using scandium-aluminum alloy. Scandium can be welded which is of interest to aircraft companies as it has been said that eliminating the rivets which is the current practice would reduce the weight of a plane by as much as 20%. The challenge is designing a new airframe can take up to a decade. Therefore other applications are needed near term to generate cash flow in the early stages of a project. A new car can take 2-3 years to

produce from scratch but with the drive to EV vehicles where weight is a major consideration, this is a key area for product development. Being in Quebec, Imperial is well situated to work with the aluminum smelters in the province.

According to Imperial Mining's PEA, gross revenues projected are CA\$15.2 billion with gross earnings about 50% at CA\$6.25 billion. The NPV is just under CA\$3 billion at a 10% discount rate and an IRR (after-tax) of 32.8%. The initial CAPEX is projected at CA\$870.9 million with a payback of 2.5 years. Impressive numbers.

Regarding the scandium itself, the drill results have shown grades that rate among the highest globally, if not the highest.

The mine is an open-pit design, which will minimize costs, and the concentration phase would be done on-site with final processing being planned to take place in Sept-Iles. The strategy is to produce a master Sc-Al alloy in Sept-Iles along with a REE concentrate. The other notable calculation is Imperial Mining uses US\$1,500/kg for Sc203 which is significantly lower than other PEAs for scandium in the marketplace. In addition, the Sc(2%)-Al alloy is discounted by 40% from the US Geological Survey 5-year trailing average, which is another conservative approach and refreshing to see instead of reporting extreme numbers which would be difficult to defend.

As noted earlier, Imperial Mining plans to produce a rare earth concentrate. This is priced at a 70% discount to market prices in March 2022, which is realistic as the main target customer would be China, which is currently buying concentrate from MP Materials out of California. This discount is in keeping with how the Chinese would calculate the value, and even then the lanthanum would not be a significant contributor. The other key point of this revenue calculation was that it is based only on the 4 key magnetic elements plus lanthanum, which is realistic

as the magnetic elements are where the main value is in all REE deposits globally. It is nice to see a company not running economics on separated REEs and saying it can sell everything it produces, which is not possible. This concentrate would help defray the scandium OPEX to a certain degree.

Overall, scandium is a situation of build it and they will come. The full report should be available by end of July.

Rare earths and scandium drill results at Imperial's Crater Lake continue to 'exceed all expectations'

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As electric vehicle (EV) manufacturers focus on achieving great energy efficiency and range lightweighting using a scandium-aluminum alloy continues to gain traction. By lowering a vehicle's weight the range can either be improved or if kept the same the cost can be reduced by using fewer batteries.

Scandium oxide demand has potential to rise from 175 tpa to 5,000-10,000 tpa if lightweighting is adopted widely across the EV sector



Source: [Imperial Mining company presentation](#)

Scandium junior miner [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) (“Imperial”) 100% owns the Crater Lake Scandium-REE Project in northeastern Quebec, Canada. The Project has a large 6km diameter complex host to high-grade scandium and some rare earths deposits. Drilling has defined a mineralized zone of over 600m in total strike length and from surface to a vertical depth of up to 200m. Scandium oxide drill result grades have ranged from 0.0235% to 0.056% (235-506 g/t) which makes the resource look potentially to be commercially viable, as viable scandium grades are typically >200-300 g/t. There is also a parallel niobium target showing grab assay results of between [0.20% and 1.42% Nb2O5](#) which sits 250m west of the scandium target.

Scandium is best known for increasing the strength and hardness of aluminum and is therefore used commercially for lightweighting in the automotive industry, space industry, for fuel cells and defense applications. Niobium is used mostly in the steel industry to significantly increase steel strength, resulting in less steel required and overall cost savings.

[Announced](#) on April 28, 2021, recent drill results at Crater Lake included results of **92.5 m @ 291g/t scandium oxide (Sc_2O_3)**. Elevated levels of total rare earth oxides plus yttrium of up to 0.42% were also found. Imperial stated in the release that “at a gold price of \$1,750US/oz and a scandium oxide price of \$1,250US/kg, the intersections represent a gold-equivalent value of 6.5 to 8.0 g/t Au”, Imperial’s President and CEO Peter Cashin [stated](#):

“The winter drilling results for the Crater Lake property continue to exceed all expectations.... mineralization has been traced by drilling over 600m in total strike length from surface to a vertical depth of up to 200m. **Importantly, the zone appears to get wider and higher grade with depth.**”

Imperial Mining's Crater Lake Scandium-REE Project in northeastern Quebec, Canada



Source: [Imperial Mining corp. website](#)

Further drill assay results [announced](#) on May 27, 2021, included an intercept of **111.9 m @ 298 g/t Sc_2O_3** . Elevated levels of **total rare earth oxides plus yttrium (TREO+Y) of up to 0.38%** were also found across the scandium-bearing horizon. Given current high prices for the magnet rare earths such as neodymium, praseodymium, dysprosium, the rare earth oxides found should help boost the projects by-products and hence project economics. The current drilling program is now completed with a total of 14 drill holes having tested the TG Zone.

Next steps and business strategy

Imperial will now undertake a 43-101 preliminary Resource Estimate of the TG zone for delivery in June 2021. Imperial's strategy is to become a producer of scandium and valuable rare earths using simple process recovery methods. Imperial would like to be a scandium disruptor and to capture market share. Over time the Company's goal is to move downstream to deliver high-margin scandium-aluminum alloy products for the automotive, aerospace, defense and fuel cell sectors. The Project's location in Canada's aluminum capital of Quebec should also lead to further market opportunities.

One such opportunity has already emerged with Eck Industries ("Eck") with a letter of intent ("LOI") [to develop scandium-modified aluminum alloys](#) for transportation, defense and aerospace markets. The research work will be directed towards developing a novel scandium-enhanced version of the currently commercially available 535 Aluminum which Eck uses for a wide

array of applications. The initial scope of work will include casting and testing of various compositions as well as characterization of the finished alloys.

Closing remarks

Imperial is still in the early stages of proving up a resource. But given scandium at economic grades is rare the Company is doing very well by finding good grade scandium and valuable rare earths. The Resource estimate is a significant near term catalyst, which would typically be followed by a Preliminary Economic Assessment (PEA) or PFS.

All of this is ahead, so given the current market cap of just C\$29 million, investors with a long-term time frame can have a chance at a potentially big reward if all goes well. The usual risks of junior miners also apply.

Jack Lifton and Peter Cashin talk about the scandium market and Imperial's strategic opportunity in the vital lightweighting space

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In an interview with [Technology Metals Show](#) host Jack Lifton, President and CEO of [Imperial Mining Group Ltd.](#) (TSXV: IPG) Peter Cashin discusses the scandium market and the economics of

the Crater Lake Project. Peter explains how Imperial Mining's Crater Lake Project provides a strategic opportunity for an exciting new line of lightweighting products. The project also contains rare earths.

"How it (Crater Lake Project) stands out is that it is a primary bedrock opportunity in Quebec," said Mr. Cashin, Imperial's President and CEO. "The grades are exceptionally high relative to our peers for a bedrock deposit. It is exposed at surface so it would be amenable to an open pit operation. Our preliminary metallurgy shows that we have very strong recoveries and high rejection rates of the gangue minerals from our metallurgical work so far. We are ideally located very close to the aluminum capital of Canada."

To access the complete interview [subscribe](#) to the [Technology Metals Show](#) and get exclusive access to member only content through this exclusive site! Or [Log-In Here](#) for the latest conversations, debates, updates and interviews with the leaders, thought leaders and investors focused on issues relating to sustainability in the critical materials sector.

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Demand for scandium set to

rise and Imperial Mining offers an early stage high grade project

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Scandium is the key to lightweight electric vehicle boom

With the electric vehicle boom set to take off this decade, expect a surge in demand for the 'lightweighting' of key materials. An essential part of reducing the weight of electric vehicles (EVs) is scandium, which mixed with aluminum creates lighter and stronger alloys for EVs. Lighter weight means extending battery range in EVs and improving fuel efficiency and reducing greenhouse gases in combustion engines.

The current scandium market size is estimated to be about [35 tonnes](#) per year, however Bloomberg forecasts this could grow to reach [1,800 tonnes](#) pa by 2035 – a 51 times increase in demand. However, if the sales of electric vehicles surge as some forecast and reach 30 million by 2030, the demand for scandium would jump to a staggering 5,250 tonnes pa – a 150-fold increase on today's demand based on just a 0.2% scandium oxide-aluminum alloy in each EV.

This exponential increase in demand for scandium does not include its additional consumption by key industries such as solid oxide fuel cells, aerospace & defense, aviation, electronics, sporting goods, and ceramics.

Building 30 million new electric cars a year by 2030 will require an additional 5,250 tonnes of scandium oxide every year

to achieve 100% lightweighting



Source: [Imperial Mining Group investor presentation](#)

[Imperial Mining Group Ltd.](#) (TSXV: IPG) owns a diverse portfolio of high-grade assets including gold, base metals and scandium-rare earth projects. The company's focus is on development of its high-quality scandium-rare earth Crater Lake property in northeastern Quebec, Canada. The property has a large 6km diameter complex that is host to high-grade scandium and niobium deposits.

The Crater Lake scandium rare earth project

The 100% owned Crater Lake Project is located 200km northeast of Schefferville, Québec, 95 km from the end of the Trans-Labrador Highway. The property consists of 57 contiguous claims covering 27.8km².

Crater Lake location map



Source: [Imperial Mining Group investor presentation](#)

Imperial Mining Group is currently working to expand the resource. Previous drilling has defined a mineralised zone over 250 meters in strike and 170 meters in depth. Scandium oxide grades ranged from [0.0235% to 0.0319%](#) (235-319g/t), which is pretty good. Scandium is not rare, however finding commercially viable grades (>200-300g/t) of scandium is very rare. More recent drill results have included [528g/t](#) scandium oxide over 8.8 meters, showing the high grade potential of the Crater Lake Project.

The company expects the Crater Lake Project to be a small open-pit operation with an on-site magnetic concentrator and/or sensor-based sorting. This should reject 50-60% of mined material, resulting in high scandium recoveries and lessening transportation risks and costs. It is anticipated that the project will be low CapEx, OpEx due to the higher grades and expected simple process recovery methods.

Future catalysts will include planned further [metallurgical work](#), [a PEA expected by Q1 2021](#), permitting, and an anticipated FS by Q3 2023, subject to financing.

Multiple market opportunities ahead as the demand for scandium increases dramatically



[Source](#)

Closing remarks

I have no doubt that the EV boom will take off, which means lightweighting will become essential for electric cars to boost performance, especially range. In the meantime there are plenty of other areas that demand scandium, so I expect the scandium sector to perform well this decade.

Imperial Mining Group has an exciting early stage high grade scandium-niobium project in northeastern Quebec. Also of interest is their 100%-owned Opawica Gold Project in the Abitibi region of northwestern Québec where recent drilling discovered [1.21 g/t gold \(Au\)](#) over a 13.3 meter length.

Risks are always high with junior mining stocks at the early stages and in this case the scandium market is another risk as it is yet to be fully developed. Of course with high risk comes the chance for high reward. Imperial Mining Group trades on a

current market cap of just C\$9 million. One to follow closely, especially since securing a source of North American scandium could soon be very much in demand.