

# Peter Cashin of Imperial Mining Talks about Scandium and its Crater Lake Project in Quebec

written by InvestorNews | March 21, 2023

In this InvestorIntel interview during PDAC 2023, Byron W King talks to [Imperial Mining Group Ltd.](#)'s (TSXV: IPG | OTCQB: IMPNF) President, CEO, and Director Peter Cashin about an update on Imperial Mining's Crater Lake Project in Quebec, Canada that focusses on scandium and rare earths. Speaking about the NI 43-101 PEA for its Crater Lake Project, Peter provides an update on Imperial Mining's patented technology for the extraction of scandium and rare earths.

With the global scandium supply dominated by Russia, Peter discusses how scandium is a critical mineral with several crucial applications in aerospace, defense, EV battery sector, and hydrogen production. He mentions that scandium is an important alloying agent with aluminum that makes it lighter, stronger, and corrosion and heat-resistant. He goes on to discuss how scandium can help in reducing carbon footprint as it is used in solid oxide fuel cells and will be part of the hydrogen infrastructure. Peter adds, "we're working on some strategic alliances that I think will be very important announcements for our shareholders."

To access the full InvestorIntel interview, [click here](#).

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## About Imperial Mining Group Ltd.

Imperial is a Canadian mineral exploration and development company focused on the advancement of its technology metals projects in Québec. Imperial is publicly listed on the TSX Venture Exchange as “IPG” and on the OTCQB Exchange as “IMPNF” and is led by an experienced team of mineral exploration and development professionals with a strong track record of mineral deposit discovery in numerous metal commodities.

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# **Imperial Mining Patents its Process in Next Steps to Become a Leading-edge Supplier of Scandium and Rare Earths**

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The race is on. It seems like there are a lot of junior miners out there working on new or improved technology to process or refine their commodity in a better, more efficient manner. This makes a lot of sense when you think about it. Obviously, the world is on a decarbonization kick, so it's only a matter of time before the carbon footprint of the raw materials starts to come into focus. It will help differentiate you from any competitors out there mining the same mineral, assuming you have any. If you happen to be fortunate enough to be located in a

jurisdiction that is close to the demand centers and has abundant clean energy (like hydroelectric power) then that could make you the #1 supplier of a commodity.

One entity looking to control its own destiny, while being fortunate enough to be located in a key jurisdiction, is [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF). Imperial is a Canadian mineral exploration and development company focused on the advancement of its technology metals projects in Québec, Canada. The Company's flagship [Crater Lake Scandium-Rare Earth property](#) is located 200 km northeast of Schefferville, Québec, and is accessible via fixed-wing aircraft or helicopter. The property consists of 96 contiguous claims covering 47.0 km<sup>2</sup>, owned 100% by Imperial. The Company is led by an experienced team of mineral exploration and development professionals with a strong track record of mineral deposit discovery in numerous metal commodities.

In mid-2022, Imperial [announced the results](#) of a positive Preliminary Economic Assessment (PEA) for the Crater Lake TG Zone Scandium (Sc) – Rare Earth Element (REE) deposit from Imperial's independent consultants WSP Canada. The results show positive cash flow, strong Internal Rate of Return (IRR), and positive Net Present Value (NPV) metrics at discount rates of up to 15% for a potential mining operation at the Crater Lake project. Highlights of the PEA include: a pre-tax NPV of C\$2.97 billion and an after-tax NPV of C\$1.72 billion (10% discount rate); pre-tax IRR is 42.9% and an after-tax IRR of 32.8%; and a pre-tax capital payback of 2.5 years from the start of production.

All of the PEA information was completed prior to the summer drilling program where the Company completed a total of 8 drillholes for 1,663.0 m. [Results](#) were encouraging and give inference to grade and tonnage increases to the TG North Lobe

Deposit resource. Drilling indicates that the southern portion of the TG scandium Zone is composed of two different Sc bearing ferrosyenites and hosts a higher proportion of the higher-grade pyroxene-rich ferrosyenite. The mineralization of both Sc-bearing ferrosyenite zones is open at depth below the 200 m vertical level and along strike and appears to show great potential for additional scandium mineralization. With all of the results in, Imperial plans to undertake an updated 43-101 Mineral Resource Estimate with the goal of converting all of the Inferred Mineral Resources into the Indicated or Measured Mineral Resources category.

With all that said, the Company's latest news is my main focus today. Imperial Mining just [announced](#) the filing of patent applications for its two-stage hydrometallurgical methods and processes for the extraction of scandium and rare earth elements from Crater Lake project mineralization titled "HIGH PRESSURE CAUSTIC LEACH METHODS AND PROCESSES FOR RECOVERY OF SCANDIUM AND RARE-EARTH OXIDES". Imperial also provided an update on the Crater Lake Scandium Project flowsheet development program which commenced in early 2022 at SGS Canada, Quebec City and Peterborough and is partially financed by a \$245,355 grant from the Quebec Ministry of Energy and Natural Resources. The flowsheet development program was focused on further optimization of the mineral processing flowsheet by rejecting olivine, a non-Sc-REE-bearing mineral from the mineral concentrate and processing the olivine-depleted mineral concentrate through the patent-pending high-pressure caustic leach process for recovery of Sc and REE. During the flowsheet development program, Imperial invented a patentable process for rejecting olivine from the scandium-bearing mineral concentrate.

I won't begin to try and explain the science of what this all means other than to say simpler is usually better. The easier and more efficiently you can do something typically equates to a

lower carbon footprint and less of an environmental liability. Just having the right, in-demand resource isn't good enough anymore, at least in most parts of the world. The production of that resource has to be done in a responsible, sustainable manner. This C\$15 million market cap company is taking steps to be a leading-edge processor of Sc and REE which could help propel them to the top of the supply chain.

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## **Peter Cashin of Imperial Mining talks about scandium's importance and the need for domestic supply**

written by InvestorNews | March 21, 2023

In this InvestorIntel interview with host Byron W King during PDAC 2022, [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) President and CEO Peter Cashin talks about the growing recognition and demand for scandium in specialized manufacturing, and the need for securing a reliable domestic supply.

In the interview, which can also be viewed in full on the InvestorIntel YouTube channel ([click here](#)), Peter describes the importance of scandium as an industrial metal: "As an alloy agent for aluminum in very, very small quantities of 0.2 to 0.4 percent you can increase the the mechanical properties of the alloy by 800%." Peter also talks about the importance of scandium, used in defense, aerospace and automotive industries

where strong, lightweight, heat and corrosion resistant metals are needed.

Peter goes on to say that only 35 tons of scandium are produced a year, mostly by Russia and China, but Imperial Mining – which just published a new PEA on its Crater Lake TG Zone Scandium-Rare Earth Element (Sc-REE) deposit – is located in Quebec, Canada. “We know that the consumers both in the the military establishment, the automotive industry and the aerospace industry have been looking for this stuff... and our intention is to produce and develop this thing to production to be able to satisfy the western and certainly North American manufacturing market.”

To access the full InvestorIntel interview, [click here](#)

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# Peter Cashin on the “earth shattering” PEA for Imperial Mining’s Crater Lake Scandium-REE deposit

written by InvestorNews | March 21, 2023

In this InvestorIntel interview with host Tracy Weslosky during PDAC 2022, [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) President and CEO Peter Cashin talks about the company’s recent PEA announcement, which confirms that its Crater Lake TG Zone Scandium-Rare Earth Element (Sc-REE) deposit has “the potential to be a long-term provider of critical Scandium and magnet Rare Earths to world markets.”

In the interview, which can also be viewed in full on the InvestorIntel YouTube channel ([click here](#)), Peter discusses how with the new PEA “people will look at the financial metrics of this project, and they they stand up against any project that’s out there currently.” He talks about the results of the new PEA, which include a pre-tax net present value (NPV) of \$2.97 billion with a pre-tax internal rate of return (IRR) of 42.9%, with annual net revenues averaging \$608 million from the sale of high-purity scandium oxide (Sc<sub>2</sub>O<sub>3</sub>), scandium-aluminum Master alloy (ScAl) and rare earth element (REE) hydroxide concentrate, and a pre-tax capital payback of 2.5 years from the start of production.

Peter also talks about the importance of scandium, used in defense, aerospace and automotive industries where strong, lightweight metals are required, and when added to other metals in small amounts it makes them heat and corrosion resistant. Its lightness makes it an attractive “green” metal reducing vehicle

weight for lower fuel consumption. “What we’ll ultimately end up doing is significantly reducing the carbon footprint of most manufactured platforms they have right now.”

To access the full InvestorIntel interview, [click here](#)

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## **Byron King and Jack Lifton discuss Scandium's bright future with Peter Cashin of Imperial Mining**

written by InvestorNews | March 21, 2023

In this episode of **Critical Minerals Corner**, Jack Lifton and

Critical Minerals Corner Co-Host & InvestorIntel Columnist Byron King are joined by Peter Cashin, President and CEO of [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) to discuss “miracle metal” scandium and how Imperial Mining is positioned to become the “largest scandium producer in the world...”

Byron King pointed out that Russia is one of the primary sources of scandium, and he went on to highlight the supply chain concerns for scandium because of the current Ukraine-Russia conflict and sanctions against Russia. Speaking about the lack of sustainable supply of scandium, Peter Cashin went on to provide an update on Imperial Mining’s Crater Lake Scandium-REE Project in Québec. Peter also provided an update on Imperial Mining’s collaboration with Eck Industries to prototype a scandium-aluminum battery box for a global automotive manufacturer.

To access the complete episode of this Critical Minerals Corner discussion, [click here](#)

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## Is Imperial Mining Group the real scandium play?

written by InvestorNews | March 21, 2023

When I first started looking into scandium, I found out that it was used in bicycle frames, aluminum alloy baseball bats and some fishing rods, which was good enough for me to be interested. However, improving the strength, corrosion resistance, and reducing the weight of those items isn’t going to raise an eyebrow at COP26 nor is it likely to dramatically

improve demand for scandium. That's why it probably makes more sense to talk about how a scandium-aluminum alloy is used in weight reduction applications in the high volume automotive, aerospace, fuel cell, and defense sectors. In fact, scandium can reduce our carbon footprint by making commercial aircraft and vehicles lighter and more fuel efficient thus lowering emissions. In EVs, scandium is used in light weighting vehicle components to extend battery range and improve fuel cell efficiency. Airbus SA has patented scandium-aluminum alloys for welding of aircraft structures in place of rivets for assembly, which reduces weight by 20%. With all the bad press emissions from air travel have gotten the last couple of days out of Glasgow, this could become a very important issue for the future of plane manufacturers.

Now that we've determined scandium is a good thing and could possibly be on the upswing as a commodity in demand, perhaps we'll discuss a North American source given that there isn't a whole lot to choose from currently. Scandium is a moderately abundant element, although it tends to be spread out throughout the earth rather than concentrated in a few places. Currently, in North America, the only notable possible production comes as a by-product of planned niobium mining at NioCorp Developments Ltd.'s (TSX: NB) Elk Creek project in Nebraska. This makes the [Crater Lake scandium-REE project](#) of [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) a unique find. It's the only hardrock scandium deposit in the world and happens to be in the mining friendly jurisdiction of Quebec, close to hydroelectric capacity and Quebec's aluminum metal production where 90% of Canada's "Green" aluminum is produced. That's already a lot of boxes ticked and we haven't even gotten into the grades of the Crater Lake project.

But first a little about Imperial Mining Group. Imperial is a Canadian mineral exploration and development company focused on

the advancement of its Crater Lake scandium-Rare Earth property. The company is led by an experienced team of mineral exploration and development professionals, who have a strong track record of mineral deposit discovery in numerous metal commodities. The Company also has a pair of gold prospects, [Opawica](#) and [La Ronciere](#) all in Quebec.

As for the Crater Lake project, in September Imperial received the inaugural [NI 43-101 Technical Report for the Crater Lake](#) TG Zone Mineral Resource Estimate.



Source: Imperial Mining Group Ltd. [press release Sep 23, 2021](#)

The results of the Resource Estimate for the Northern Lobe of the TG Zone far exceeded the minimum threshold resource Imperial internally set for a 20-25-year notional mining operation, based on a 10 million ton lift. And the good news is that mineralization remains open laterally and at depth, demonstrating the potential to increase the mineral resource with additional drilling. Imperial will soon commence work on an NI 43-101 Preliminary Economic Assessment (PEA).

Another strategy that sets Imperial apart is that it is actively collaborating with partners to further the development of strategic scandium marketing activities to projects that require important weight and carbon footprint reductions. A great example is their work with Eck Industries to [begin prototyping components](#) while concurrently looking to maximize weight savings for the transportation sector. They recently showed that the material properties for EV battery box requirements, as specified by a major North American automotive manufacturer, have been met or exceeded. Last month the Company was awarded, along with its partner FusiA Groupe, [C\\$2.6 million for a scandium-aluminum material R&D project](#). The project will focus

on the industrialization and the development of a vertically integrated supply chain for a scandium-aluminum alloy for 3D printing. I'm impressed by the fact that Imperial is increasing the awareness and demand for their product before they've put their project into commercial production.

Unless you've been living under a rock for the last few months, we all know the impact that the interruption of supply chains has had on virtually everything. The manufacturing world is learning the hard way that it might be time to "on-shore" critical parts of their supply chain if they want to complete their product manufacturing, let alone compete. So, to be one of the best grade scandium resources in the world and be located on mining friendly, North American, soil means we should all probably pay a little closer attention to Imperial Mining.

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## **Peter Cashin on Imperial Mining's high-recovery extraction process for rare earths and scandium**

written by InvestorNews | March 21, 2023

In a recent InvestorIntel interview, Tracy Weslosky speaks with Peter Cashin, President, CEO and Director of [Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) about Imperial's recent milestones including their new high-recovery extraction [process](#) for rare earths and scandium. Additionally, they discuss Imperial's [recent news](#) around their collaboration with Eck

Industries to develop scandium-modified aluminum alloys.

In this InvestorIntel interview, which may also be viewed on YouTube ([click here to subscribe to the InvestorIntel Channel](#)), Peter went on to say that Imperial is not just a scandium play as its Crater Lake Project has a diversified commodity base with significant quantities of rare earths and niobium. He also provided an update on the latest [drill results](#) from Crater Lake and added that Imperial Mining's objective is to create a sustainable scandium supply chain.

To watch the full interview, [click here](#)

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## **Rare earths and scandium drill results at Imperial's Crater**

# Lake continue to 'exceed all expectations'

written by InvestorNews | March 21, 2023

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 ( $\text{Sc}_2\text{O}_3$ )**. 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  $\text{Sc}_2\text{O}_3$** . 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.

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# Betting on scandium-aluminum lightweighting to take off, Imperial Mining Group is set to benefit from EV market demand

written by InvestorNews | March 21, 2023

[Imperial Mining Group Ltd.](#) (TSXV: IPG | OTCQB: IMPNF) is an early stage scandium junior miner (also with two prospective gold properties) in Quebec hoping to cash in on the move towards scandium-aluminum alloys for lightweighting of vehicles such as spacecraft, airplanes, and especially electric vehicles (EVs).

Scandium is still not widely used due to limited supply and scandium being expensive. This means the scandium supply chain is minimal as the industry has not yet grown. The current global scandium supply is only about 35 tonnes pa of scandium oxide. Demand is forecast to boom to as high as [1,800 tonnes pa by 2035](#) (Bloomberg forecast, 2018). If that were to happen, it would mean a 51-fold increase in scandium demand over the next 15 years. Interestingly the 2020 Bloomberg forecast for electric vehicles is for them to rise from [2.2M](#) in 2019 to [~54M](#) by 2040. That would be a ~25-fold increase. So clearly the EV boom has the potential to be a strong driver of scandium demand if scandium-aluminum lightweighting becomes widely adopted.

**Another estimate of the impact of surging EV sales on the potential demand for scandium**



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

A major issue with EVs is getting their purchase price down which should lead to mass adoption this decade. If an EV weighs less then it can use a smaller battery to get the same range, thereby lowering the EVs cost. Looking ahead this decade if scandium-aluminum alloys become much more widely used, this should lead to a virtuous cycle of cheaper scandium as supply expands and far greater scandium use.

The airline industry and the space industry are other examples where lightweighting becomes vitally important to reduce fuel costs.

This brings us back to Imperial Mining Group, which has one of the lowest market caps (currently C\$25M) of all the junior scandium miners as shown below.

### **Scandium junior miners market cap comparison as of early March 2021**



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

### **The Crater Lake Scandium-REE Property/Project**

Imperial Mining's focus is on the development of its high-quality scandium-REE Crater Lake Property in northeastern Quebec, Canada. The 100% owned property consists of 57 contiguous claims covering 27.8km<sup>2</sup>. It has a large 6km diameter complex host to high-grade scandium and niobium deposits. Imperial Mining is currently working to expand the resource.

Previous drilling has defined a mineralised zone of over 250m in

strike and 170m in depth. Scandium oxide grades ranged from [0.0235% to 0.0319%](#) (235-319 g/t), which is good. Commercially viable grades (>200-300 g/t) of scandium are very rare. Early drill results included [528 g/t](#) scandium oxide over 8.8m.

2020 TG Zone drilling intersected intervals grading up to [253 g/t Scandium Oxide \(Sc<sub>2</sub>O<sub>3</sub>\) over 29.14 m](#). These are again very good drill results. Imperial Mining [stated](#) in Nov. 2020:

- “The scandium rich zone also contains elevated levels of total rare earth oxides plus yttrium (TREO+Y) grading up to 0.419%.
- The scandium mineralized zone is estimated to be up to 110 m in true thickness and continues to be open at depth below 200 m down-dip and along strike.
- The evident increase in scandium grades with depth is also very encouraging, however more work needs to be done to fully quantify the scandium and REE resource potential on the property.”

Imperial Mining’s goal is to define a scandium-REE mineral resource of [a minimum of 10 Mt](#). Recoveries to date have been strong at [97-98% for scandium and 79% for rare earths](#).

Well funded after recent [oversubscribed capital raises](#), Imperial Mining plans to spend [C\\$2M](#) to achieve their 2021 plans. These include further drilling, [metallurgical recovery additional method testing](#) (April), a 43-101 Resource report (May), and a PEA (July-August). Beyond that next will be permitting and a completed Feasibility Study by end 2023, subject to financing.

The Company plans the Crater Lake Project to be a small open-pit operation with on-site magnetic concentrator and/or sensor-based sorting resulting in high scandium recoveries. It is expected that the Project will be a low CapEx, OpEx due to the high grades and using simple process recovery methods.

## Closing remarks

Imperial Mining Group has recently started trading on the [OTCQB Venture Market](#) in the U.S., which provides US investors with a pathway to invest and participate in the Imperial Mining Group story.

Given the potential exponential growth ahead if scandium lightweighting takes off in a big way, first mover scandium junior miners such as Imperial Mining Group can be big winners.

Risk is high and patience is needed. One plus for investors is Imperial Mining also has some gold prospective properties in Quebec ([La Roncière](#) and [Opawica](#)), with a [recent increased](#) interest in La Roncière. Always good to have some gold as insurance.

We will continue to follow the Imperial Mining Group story as it unfolds. Stay tuned.