

Building a Global Scandium Supply Chain: Crater Lake Project, Quebec, Canada

Peter J. Cashin
President & Chief Executive Officer
Imperial Mining Group Ltd.

The potential application of scandium as a grain-refiner and hardener in aluminum alloys is well established from research and development work in recent years but its use has been limited due to the lack of primary supply sources outside China and Russia. This is primarily due to the limited availability of scandium in the commercial market. Available scandium supply today is estimated at just 35 metric tonnes per year, insufficient for widespread adoption of scandium-aluminum (“Sc-Al”) alloys in automotive, aerospace, defense and green energy applications. The lack of a reliable domestic supply source and a 100% import reliance on the Peoples Republic of China and Russia, has frustrated wider use of scandium-aluminum alloys by the western manufacturers.

A new and reliable source of supply could enable the realization of the substantial benefits of the scandium aluminum alloy in next-generation, high-strength lightweight materials. Benefits include easy fabrication of parts with a hardness approaching that of titanium, the superplastic nature of such alloys and improved weldability for aluminum structures incorporating the alloy. In addition to Sc-Al alloys, scandium is used in the Solid Oxide Fuel Cell (“SOFC”) industry because of its heat stabilization and electrical conductivity characteristics. In SOFC applications, scandium is important in the scandia-stabilized electrolyte, which allows lower operating temperatures and a longer operating life of the cell. It has also found a growing market in Light Emitting Diode (LED) lighting industry, especially those seeking “natural light”, where, in certain applications, no substitute exists due to the unique properties of the metal. Additional benefits of scandium use in high-strength aluminum alloys include corrosion resistance, suppression of material aging, resistance to thermal recrystallization and infinite recyclability.

Imperial Mining Group Ltd. is a Canadian public mineral resource development company based in Montreal, Canada, focused on Technology Metals opportunities in northern Quebec. Exploration on Imperial’s wholly owned Crater Lake Project between 2009 and 2019 has identified multiple primary scandium and rare earth bedrock mineral resources on its Crater Lake project in northeastern Quebec.

Crater Lake is uniquely enriched in scandium compared to other geologically similar bedrock deposits, with grades of up to 1,600 ppm Sc and potential for large tonnages. Preliminary work indicates that Imperial will have advantages in terms of overall costs of recovery allowing it to offer its scandium product at a lower price point than its competitors. Further, the resource is located to the north of the Saguenay region of Quebec, the centre for aluminum production in Canada, providing them with a potential local source of scandium for production of Sc-Alloys. Understanding scandium market dynamics is to recognize the price sensitivity of the consuming industries.

The talk will discuss the market dynamics for scandium, describe the Crater Lake project and outline Imperial Mining’s strategy to establish itself as a long-term, sustainable supplier of this critical commodity.