A titan of titanium – with a big HAMR

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Companies that combine hard rock assets with technology have a unique appeal. It gives you the tangible and familiar steps of a mining company – drill, initial resource, PFS, and PEA progress that you can measure and monitor with reasonable transparency. But if it also has an innovative technology component, it also can offer the potential of a greater upside if the technology side of the business ends up being a game-changer. Granted you have to have the funding and the human resources to keep both aspects of the business moving forward in a way that is beneficial to shareholders, which can be a challenge depending on your size. But if you keep making positive progress on both fronts without sacrificing one aspect of the business or the other, then a shareholder can be handsomely rewarded. It's also good diversification if one of your business units lays an egg so to speak.

Today's company could also almost fit the bill for the Dean's List critical minerals series except that its mineral assets are in the U.S. Arguably, that's better for investors given the size of the market and the scale for potential government support. So let's dive into IperionX Limited (NASDAQ: IPX | ASX: IPX), a U.S. critical minerals company that is also pursuing a patented powder metallurgy process technology that allows for the production of titanium powders. The company aims to be a leading developer of sustainable critical mineral supply chains in the United States through a multi-pronged strategy comprising a variety of technology, integration, and sustainability focused initiatives.

Starting with the mining side of the business, IperionX holds a 100% interest in the Titan Project located in Tennessee, a very large titanium resource in North America which is also rich in rare earth minerals. The Titan Project is one of the largest titanium, zirconium and rare earth minerals deposits in the U.S., forming part of a large-scale critical mineralization trend in an area known as the Mississippi embayment. The Titan Project's unconsolidated, near-surface mineral sand hosted material allows the potential for simple, low-impact, low-cost and sustainable mineral extraction, unlike many hard rock mineral deposits.

IperionX released the result of a scoping study on the Project in late June which included an after tax NPV_8 of US$692 million, potential for significant cashflow generation including an average annual EBITDA of US$117 million, and a 1.9 year payback period. Another highlight that I believe will help elevate the profile of this project is the development of a sequential mining method to allow for a low cost, reduced area footprint and environmentally sustainable mining process. Lastly, the location (aside from simply being in the U.S.) is near existing infrastructure including low-cost power and gas, with high-capacity transmission lines near the Project, abundant transportation infrastructure including the Norfolk Southern mainline running through Camden, the major I-40 highway just 10 miles south of Camden and a major barge-loading point 15 miles from the Titan Project connecting to all major U.S. customers and export ports. I believe once the U.S. gets the ball rolling on domestic supply of various commodities, that sustainability and carbon footprint will be the differentiator between a good project and a great project.

On the technology side, IperionX holds an exclusive option to acquire the HAMR technology and other associated technologies. The patented metal technologies, centered around Hydrogen

Assisted Metallothermic Reduction (HAMR), were invented by world-renowned metallurgist, Dr. Zak Fang, Professor of Metallurgical Engineering at the University of Utah. The HAMR process allows for the production of titanium powders. This process can take almost any form of titanium or scrap titanium alloy feedstock and produce titanium powders at very low energy intensity, enabling the potential for low cost, low carbon emission production in a sustainable closed loop. I won't get into the details of the technology because it's way over my head and I'm not sure I'd explain it properly, but what's important is that its low cost, has reduced energy consumption, and has 100% titanium recycling potential.

IperionX is already producing titanium powder with its partner BlackSand at a pilot facility operating in Salt Lake City, Utah, built with funding from the U.S. Department of Energy's ARPA-E. Development of a larger Titanium Demonstration Facility (TDF) is currently underway with a targeted production capacity of 125tpa. The TDF will serve a dual purpose of demonstrating scale while allowing for the commencement of powder production for commercial sales.

Next on the list of milestones for the company is to continue work to get the Titan Project construction ready, begin discussions with potential titanium metal strategic customers and scale-up titanium metal powder production capacity (the TDF noted above). Any or all of these could provide catalysts for IperionX's shareholders over the next few months.