

Graphite: The Top 5 North American Players to Watch

While all members of the critical minerals list are of course critical, the one that should be especially worrisome for politicians and strategic planners is graphite.

Graphite is unique because it cuts across so many different industries, ranging from the mundane lead pencil to an essential role in lubricants to a starring role in EV batteries, where graphite represents 20-30% of the volume of each battery.

The reason to worry is because the United States imports 100% of annual graphite consumption, while China controls roughly 80% of global output.

Besides all the obvious reasons this matters, a less obvious reason is that graphite is the feedstock for graphene, which is the wonder material of our lifetimes. Graphene is only one atom thick but is 40X stronger than diamonds and 200X stronger than steel. It is flexible, transparent, highly conductive, and is impermeable to most gases and liquids.

Graphene's properties are so extraordinary that when its founding scientists submitted a paper to *Nature* announcing its discovery, it was twice rejected as being too unbelievable. Since that discovery 18 years ago, graphene has become perhaps the most heavily researched material on earth, and carries the potential to revolutionize entire industries including electricity, energy production, batteries, sensors, solar panels, and more.

The takeaway is that U.S. vulnerability will only grow as applications of graphene multiply.

Fortunately, the problem appears fixable. Although the US

currently produces no graphite, Canada has several mines in operation and several more moving toward production. Also, several projects in the US are now in development or are reopening after decades in mothballs.

Here is a quick overview of five of the largest North American graphite projects either in production or in development. The list is based upon projected annual graphite production. They are:

- Nouveau Monde Graphite Inc. (NYSE: NMG | TSXV: NOU)
- Lomiko Metals Inc. (TSXV: LMR | OTCQB: LMRMF)
- Graphite One Inc. (TSXV: GPH | OTCQX: GPHOF)
- Northern Graphite Corporation (TSXV: NGC | OTCQB: NGPHF)
- Mason Graphite Inc. (TSXV: LLG | OTCQX: MGPHF)

Nouveau Monde Graphite Inc., located in Quebec, just completed a feasibility study suggesting it will be the largest graphite project in North America, with 100,000 tons per year (tpy) of of graphite concentrate a portion of which will feed its battery material plant for 43,000 tpy of anode material production, a 21% IRR and a C\$ 1,581 million NPV. The company is now lining up project financing to bring the property into production, and is reportedly getting material support from the Canadian and US governments.

Lomiko Metals Inc. is also located in Quebec and controls the La Loutre deposit, an earlier-stage project in southern Quebec that is projected to generate 100,000 tpy of graphite. A pre-feasibility study is scheduled for release this summer, but a PEA delivered in July, 2021 projected a 28% IRR and a C\$ 314 million NPV.

Graphite One Inc. is the largest US graphite project in development. The deposit, located on the Seward Peninsula in Alaska, has only been 20% drilled at this point, and a PFS is slated for publication shortly. A PEA released in 2017 projected 60,000 tpy of output, a 27% IRR, and a \$ 1.3 billion

NPV.

Northern Graphite Corporation recently purchased the only significant graphite producer in North America, which is located in Quebec and generates 55,000 tpy. This production will eventually be supplemented by another property, called Bissett Creek, which is in earlier-stage development. It is notable that Northern Graphite's financial partner is Sprott Capital, which has made an extensive principal investment in the company and has raised over \$ 30 million in outside capital.

Mason Graphite Inc. is another Quebec-based project, and is described by management as one of the highest-grade graphite deposits in the world. The company has a feasibility study in place that projects 52,000 tpy of output, a pre-tax IRR of 28%, and an NPV of \$ 484 million. Just two months ago the company signed a joint venture agreement with Nouveau Monde Graphite (see above) to develop the resource, which will result in an almost equal split of the projected economics.

How quickly these projects move into production is, as always, in the hands of various regulatory authorities. Given graphite's critical importance, we can only hope these approvals are expedited.