

Targeting next generation silicon anode materials NEO Battery Materials up 387.5% in 2021

written by InvestorNews | January 10, 2022

2021 will be remembered as the year that the western world woke up to the electric vehicle (EV) boom, especially boosted by the fact that global electric car sales look set to finish up [about 100% YoY](#). So what will 2022 bring? I previously wrote [here](#) my top 3 stock picks for 2022 and [here](#) are my top 5 graphite miners to watch in 2022; but today's company looks set to benefit from a little-known trend in the EV world.

That trend is the increasing use of silicon in battery anodes to boost battery performance, especially charging speed and energy density (range). This is because when a battery charges the rate of charge depends on how quickly the 'anode' can absorb or fill up with electrons. By adding silicon into the graphite anode it is better able to absorb more electrons and therefore the battery has better capacity. Companies continue to work on some of the challenges of silicon in anodes which include swelling, cracking and lower cycle life.

Today we look at [NEO Battery Materials Ltd.](#) (TSXV: NBM | OTCQB: NBMFF) ("NEO") whose stock price rose [387.5%](#) on the TSXV in 2021. NEO is a Canadian battery materials company with a current focus on developing silicon anode materials through an ion-and electron-conductive polymer nanocoating technology.

Looking back on 2021, NEO had a strong year ([company highlights here](#)) especially in building up both their technology and their

team. You can read some more on that in my last article: [Making lithium-ion battery components more durable and efficient to improve battery capacity](#). In that article, I discussed how NEO's 'pure' silicon anode materials were already achieving much higher cycle-life than competitors (NEO is achieving 1,000 cycles) with the main benefit of silicon material in anodes being greater energy density and charging speeds. Conventional lithium-ion batteries with graphite anodes have a cycle life of between 2,000 and 5,000+ cycles.

It should be noted that there is today a growing market for silicon anode materials to be used as an additional material combined with a conventional graphite anode to boost performance. Tesla is one of many that use silicon-graphite anodes.

In recent months NEO has made further progress as shown by three recent significant announcements:

- Dec. 6, 2021 – [NEO Battery Materials announces the launch of 3 silicon anode material products “NBMSiDE” for high performance lithium-ion batteries](#)
- Dec. 24, 2021 – [Korean Intellectual Property Office issues core patent for NEO Battery Materials' silicon anodes for high performance lithium-ion batteries](#)
- Jan. 6, 2022 – [NEO Battery Materials Builds NBM Korea R&D Scale-Up Centre in South Korea's Yonsei University](#)

Within the three announcements above the key progress for NEO is the launch of 3 types of silicon (“Si”) anode active materials (NBMSiDE-P100, NBMSiDE-P200, and NBMSiDE-C100), and the fact that NEO is on schedule for semi-commercial scale production of these materials by the end of 2022. Regarding the 3 silicon anode materials NEO [stated](#):

“The three types of products are manufactured through NEO’s proprietary nanocoating technology and are based on metallurgical-grade silicon with purities of at least 99.95%....**NEO’s technology significantly improves the life span and cycling stability compared to conventional metallurgical silicon-based particles.**”

NEO President and CEO, Spencer Huh, [stated](#): “We are very glad to bring the 3 types of silicon anode active prototypes to the market as a result of valuable research and development for the past 7 years. All our business developments are aligned with our plans and strategy, and we have complete confidence in pushing towards the semi-commercial plant facility in South Korea. **NEO is positioning itself as a low-cost, robust Si anode materials supplier for electric vehicle lithium-ion batteries, and we are set to provide long-term value for all stakeholders.**”

Note: Bold emphasis by the author.

The Company also [stated](#): “NEO is expediting the process of developing its 100% pure silicon anode based on CNT (carbon nanotube) conductive additives and new robust binder technologies, and is currently conducting research and progressing commercialization projects regarding the graphite/silicon composite anode through active collaboration with companies that have signed NDAs.....Our process that effectively reduces the cost of Si anode production will act as a stark point of differentiation compared to existing and potential competitors.”

Also of significance is that [NEO has established and built its R&D Scale-Up Centre](#) at the Yonsei University of South Korea through NEO Battery Materials Korea Co., Ltd., a wholly-owned subsidiary of the Company. NEO believes that this R&D center “could speed up further development of additional NBMSiDE

pipelines of silicon anode active materials.”

Closing remarks

NEO is at the leading edge in developing lower cost silicon anode active materials and recently launched 3 new silicon anode materials products with [another 2](#) to follow soon. Usually, once product samples are released it often leads to off-take agreements. Planned semi-commercial scale production of these materials by the end of 2022 offers a strong potential catalyst for investors.

NEO Battery Materials trades on market cap of [C\\$34 million](#) and is definitely a stock to watch closely in 2022.

Making lithium ion battery components more durable and efficient to improve battery capacity

written by InvestorNews | January 10, 2022

NEO Battery Materials’ Progressing on the Development and Commercialization of Longer Lasting Higher Energy Density Lithium Ion Battery Components

Investors looking for a cutting edge technology company in the

electric vehicle (EV) battery components sector need look no further than [NEO Battery Materials Ltd.](#) (TSXV: NBM | OTCQB: NBMFF). NEO is a North American battery materials company with a current focus on developing silicon anode (the negative electrode in a battery) materials through its “ion-and electronic-conductive polymer nanocoating technology.” Or, in simpler language, a ‘silicon material’ for batteries, used to make the anode last longer in service (make it capable of being charged and recharged more times without losing integrity or efficiency) and be capable of holding more energy, thus making the battery more durable and efficient

NEO [states](#): “NEO has a focus on producing silicon anode materials through its proprietary single-step nanocoating process, which provides improvements in capacity and efficiency over that of lithium-ion batteries using graphite in their anode materials.”

NEO’s stock price has been on a tear in 2021; however, the recent pullback potentially gives a better entry point for investors.

NEO Battery Materials (TSXV: NBM) 1 year stock price chart



Source: [Yahoo Finance](#)

Another thing that investors love is active management that can rapidly progress a company and produce lots of good news. We’ll take a look at the news flow summary below, just for November 2021.

- [Nov. 23, 2021](#) – NEO Battery Materials appoints lithium-ion battery electrode binder and polymer technology expert, Dr. Byeong-Su Kim, to Scientific Advisory Board. The news

[states](#): “Utilizing robust binder technologies with characteristics such as a high elastic modulus can **help contain and control the volume expansion of silicon**, resulting in lower probabilities of particle pulverization and a cracking anode.”

- [Nov. 18, 2021](#) – NEO Battery Materials receives approval for a core patent from the Korean Intellectual Property Office.
- [Nov. 16, 2021](#) – NEO Battery Materials announces research consortium LOI with both the University of Toronto **and with an undisclosed global OEM for R&D and scale-up of EV Battery Materials**. The preliminary project will involve the full electrode fabrication of silicon-carbon composite anodes through NEO’s silicon particle nanocoating process....With the active material (silicon and/or graphite), binders and conductive additives as core components....
- [Nov. 10, 2021](#) – NEO Battery Materials appoints Dr. Dongmok Whang, expert in low-dimensional nanomaterials and graphene, to Scientific Advisory Board. His research expertise lies in the field of fabrication and manufacturing of low-dimensional nanomaterials, especially **graphene, semiconductor nanowires, and porous nanostructures** for applications in electric vehicle lithium-ion batteries, fuel cells, and various energy storage solutions.
- [Nov. 4, 2021](#) – NEO Battery Materials accomplishes **anode production capacity upscaling Project** over the past three months. The news [states](#): “From the initial production rate of several grams per hour for manufacturing silicon anode materials at the lab-scale, **NEO’s engineering team has accomplished to expand the rate to a level of several kilograms per hour**. This is a result of improving productivity by more than 1,000-fold, and the success of

the Project at this level has given stronger validation for **the 120-ton semi-commercial plant that is scheduled to be commissioned by the end of next year.**" President & CEO Spencer Huh, added: "As NEO understands the need to fast-track into mass production, we are pleased to announce the accomplishment of the Upscaling Project. The Company is at the forefront of developing unique Si anode lines through the low-cost manufacturing process, and we are customizing solutions for various downstream users to optimize the products for high-power electric vehicle lithium-ion battery applications."

The above 5 news items, when added together' show the rapid pace and progress NEO is achieving. Looking back on the previous two months there were even more great achievements by NEO. The standout news came on October 26 when NEO [announced](#): "**Completion of semi-commercial plant conceptual design** and initiates engineering EPC stage for construction." The facility will be in South Korea. President & CEO, Spencer Huh, [stated](#): "NEO is now another step towards commercializing our silicon anode materials for EV lithium-ion batteries and is actively expediting our timelines and milestones."

As shown below the problem with silicon in anodes can be that as the silicon absorbs the electrons it expands then cracks the anode, leading to a low cycle life (low longevity). NEO has managed to improve this by using its cost-effective and efficient one-pot, single-step, nanocoating process.

NEO Battery Materials state that their silicon anode materials are already achieving much higher cycles than competitors



Source: [NEO Battery Materials company website](#)

Closing remarks

A lot of the details surrounding NEO Battery Materials' achievements are not very well understood by investors. This is only natural as most investors are not battery material scientists.

The key to understanding NEO's work is that its silicon anodes or composite silicon graphite anodes can significantly improve battery capacity, which relates to greater energy density, and hence longer range for the same size battery. What EV manufacturers and customers all want is better performing batteries that result in longer driving range for a given size battery. Silicon anodes today present many challenges, especially cracking leading to poor cycle life. NEO is making great strides in solving this problem by producing silicon anode materials with a much longer cycle life.

If NEO can succeed in meeting commercial standards it will have Tesla and other EV and battery/anode OEMs knocking on its door. For now it appears there is plenty of promise, especially given the longer cycling results (1,000 cycles) and recent production scaling progress, as well as the interest from an OEM in joining NEO's research consortium.

NEO Battery Materials trades on a market cap of [C\\$39 million](#). It's one to watch.