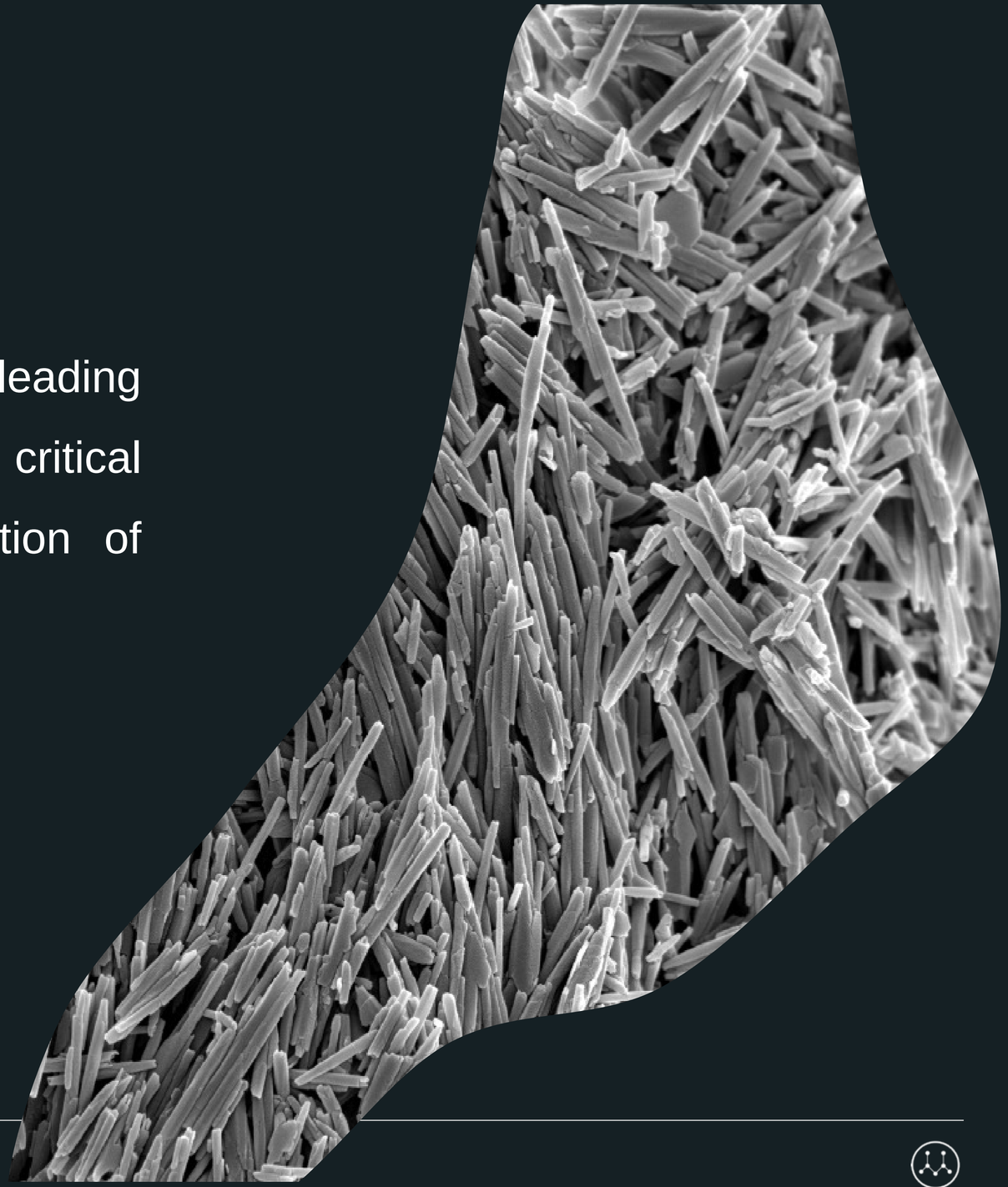
Vertically Integrated & Highly Scalable Nano-Silicon for the Next Generation of Electric Vehicles

Dr Jake Entwistle

01 About Us

Our mission is to become the world’s leading producer of nano-silicon anode powders & critical mineral byproducts for the next generation of advanced lithium-ion batteries.



As the owner and operator of the world’s largest deposits of high-purity halloysite, the ideal nano-silicon feedstock, we have a critical advantage towards achieving this mission.

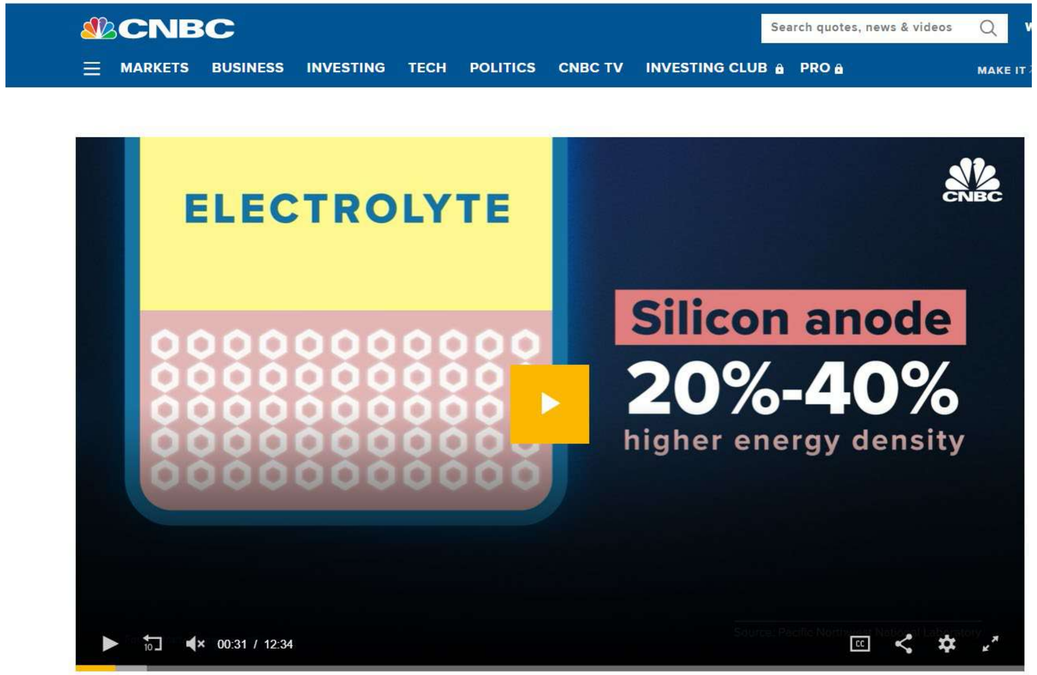
Critical advantage:

Halloysite, the ideal nano-silicon feedstock

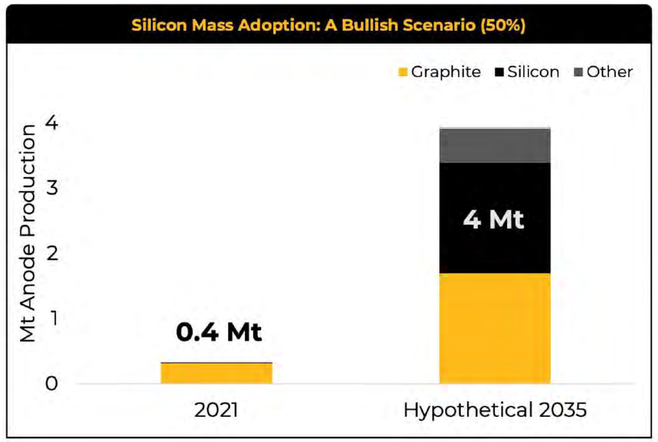
- Halloysite, an aluminum silicate clay, with naturally occurring nano-tubular structure, has been proven to be the ideal feedstock material from which to economically scale up production of nano-silicon.
- Our halloysite has the chemistry, shape and nano-particle size that others are attempting to produce synthetically.
- With halloysite, the biggest challenge of making the silicon nano-particle has been solved in the ground by mother nature over a period of 35 million years. This is our key competitive advantage.

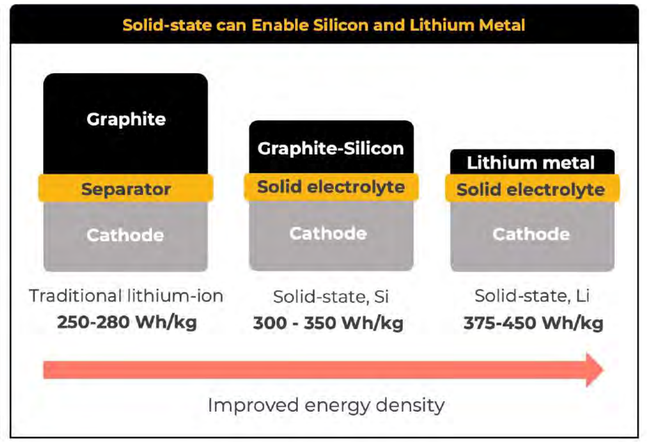
02 The Nano-Silicon Market Opportunity

Silicon becomes mainstream



Silicon sits at the frontier of anode development





BENCHMARK

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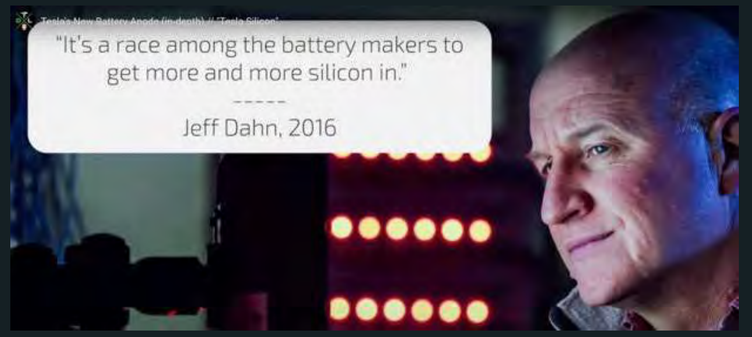
The largest auto makers in the world agree

Tesla

Tesla shared its “plans on removing graphite from the anode” at Tesla Battery Day on September 23, 2020. Currently limited to using 10% micro-silicon due to swelling issues



GM

President Mark Reuss shared that the company is experimenting with silicon-rich and lithium metal anodes at an Investor Conference on April 7, 2021

Volkswagen / Porsche

Chairman of the Executive Board, Oliver Blume, said “Silicon has big potential,” in reference to the high demands of the company’s electrified sports and race cars at Volkswagen Power Day, March 15, 2021

Mercedes

“Rather than simply increasing the size of the battery, Mercedes-Benz and the HPP team developed a completely new battery pack for the VISION EQXX, achieving a remarkable energy density of close to 400 Wh/l. Their higher silicon content and advanced composition mean they can hold considerably more energy than commonly used anodes"

03 The Ionic MT Scalability Advantage

Our site, containing an initial 2.4mm+ ton reserve of halloysite. More drilling planned to increase reserves

Our vertically integrated process

One of the only known vertically-integrated producers of nano-silicon.

Mining - Halloysite feedstock

Plant processing - Wet beneficiation (purification) & de-alumination

Alumina precipitation of halloysite (acid leaching)

Current price: $3K-30K / ton
Byproduct: high purity alumina

Magnesiothermic reduction of silica (nano-silicon leaching)

The main product: nano-silicon (Ionisil™)

Magnesium oxide precipitation post Mg-thermic reduction of silicon

Byproduct: magnesium oxide
Current price: $700-3K /ton

New 36,000 SF Manufacturing Facility For Scale-up to over 20,000 TPA OF Ionisil™

In 2022, Ionic MT secured a lease (with an option to purchase) for a 36,000 square foot manufacturing facility, currently under construction. The anticipated moving date is by August 1, 2023. The new facility will allow an expedited scale-up to tens of thousands of tons of Ionisil™ production annually.

Ionic Mineral Technologies Key Advantages

1. Ideal feedstock

We own & operate the world's largest deposit of high purity halloysite, nano-silicon's ideal feedstock, enabling us to work "top down"

2. Scalable, high-volume production

We have a patent pending process that is the first to have ever produced nano-silicon through a continuous magnesiothermic reduction without the need for harmful HF acid using established industrial processing equipment

3. Production cost advantage

We believe we have the lowest cost of production across the entire industry enabling us to sell our product at price parity with synthetic graphite on a $/mAh/g basis.

4. Vertically-integrated

We are one of the only known vertically-integrated producers of nano-silicon

5. Byproducts

Our process outputs critical mineral by-products and produces no harmful waste or emissions

6. Sustainable, U.S.-made

Our process is low impact, sustainable and made in the U.S.A., which is beneficial due to requirements of the IRA

04 Ionisil Gen 1 Product Battery Performance update

First Generation Ionisil ™

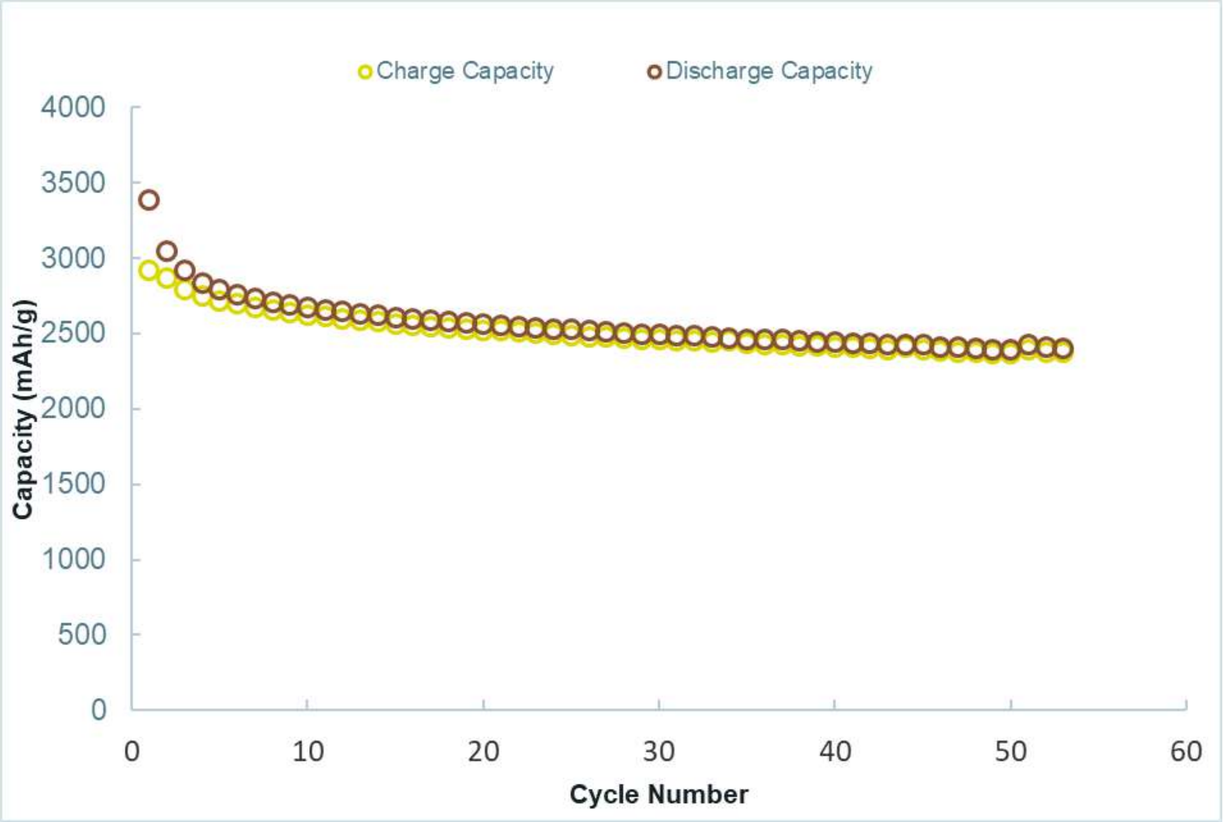
2700 mAh/g reversible capacity with 85% ICE

Approximately 7.5X higher capacity than synthetic graphite

Ionisil ™ Battery testing updates

All silicon electrodes

Silicon stable at <u>2400 mAh/g</u> capacity

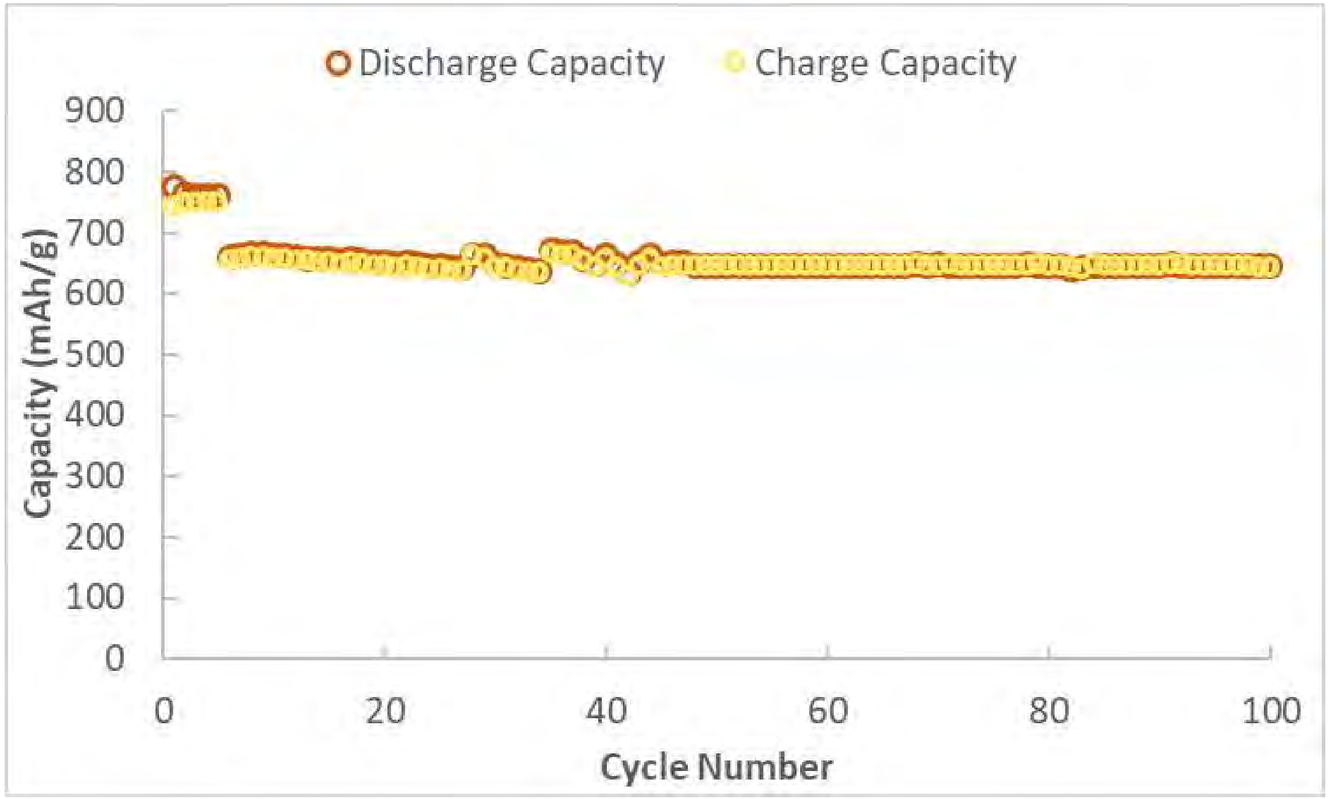


Ionisil ™ Battery testing updates

Graphite blend electrodes

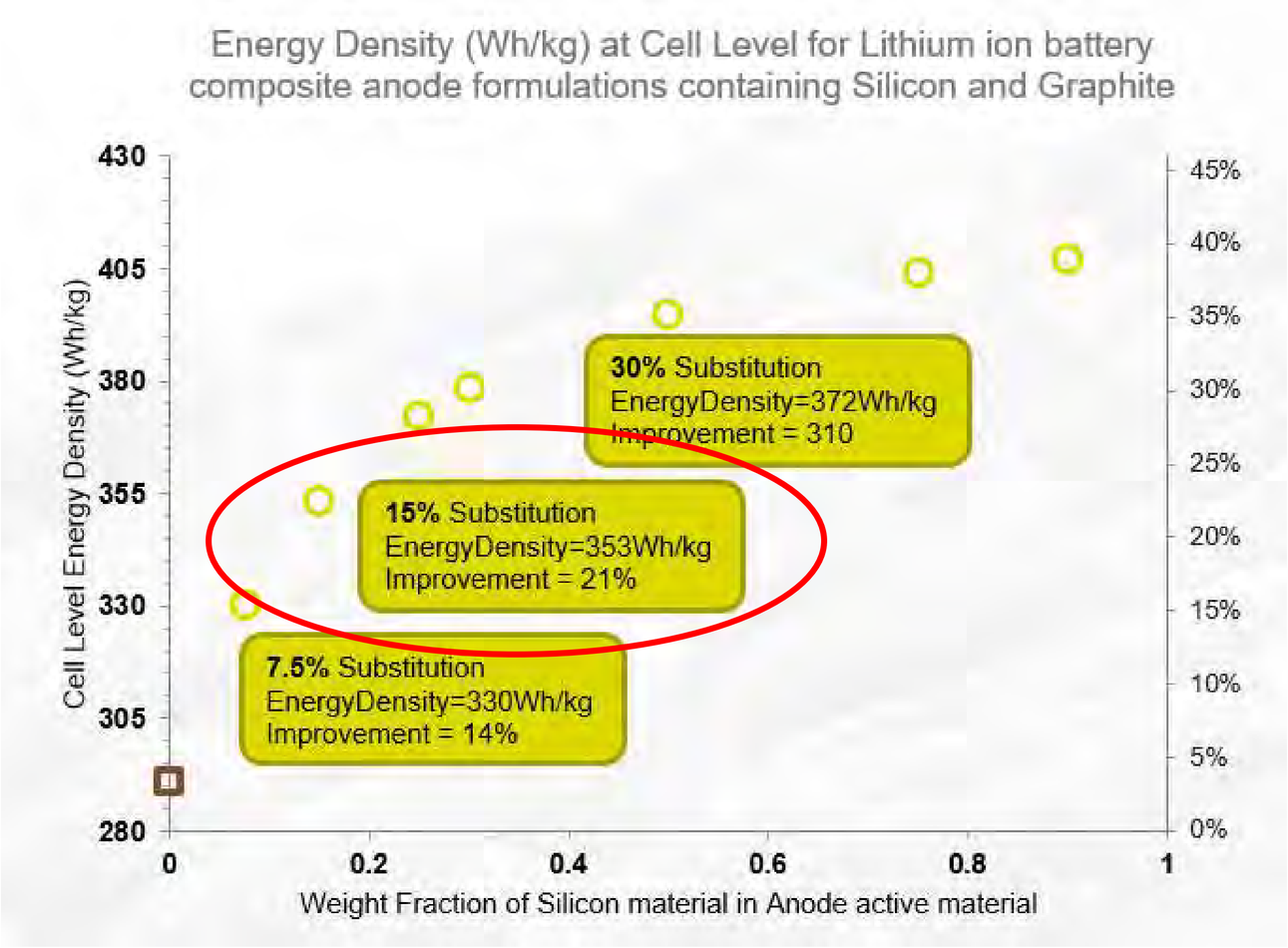
<u>15%</u> substitution of graphite = <u>2X</u> anode specific capacity

A true ‘drop in’ solution



Ionisil ™ Battery testing updates

Full Cell Energy Density

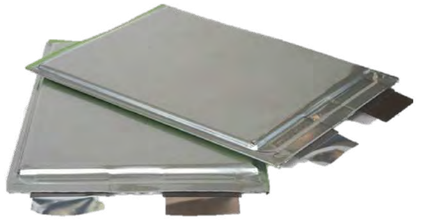


In House coin cell testing

Scale up to larger formats

Single Layer pouch cell

Larger scale pouch formats >2Ah



05 Closing and Questions?

Thank You!

Dr Jake Entwistle

Director of Battery Materials

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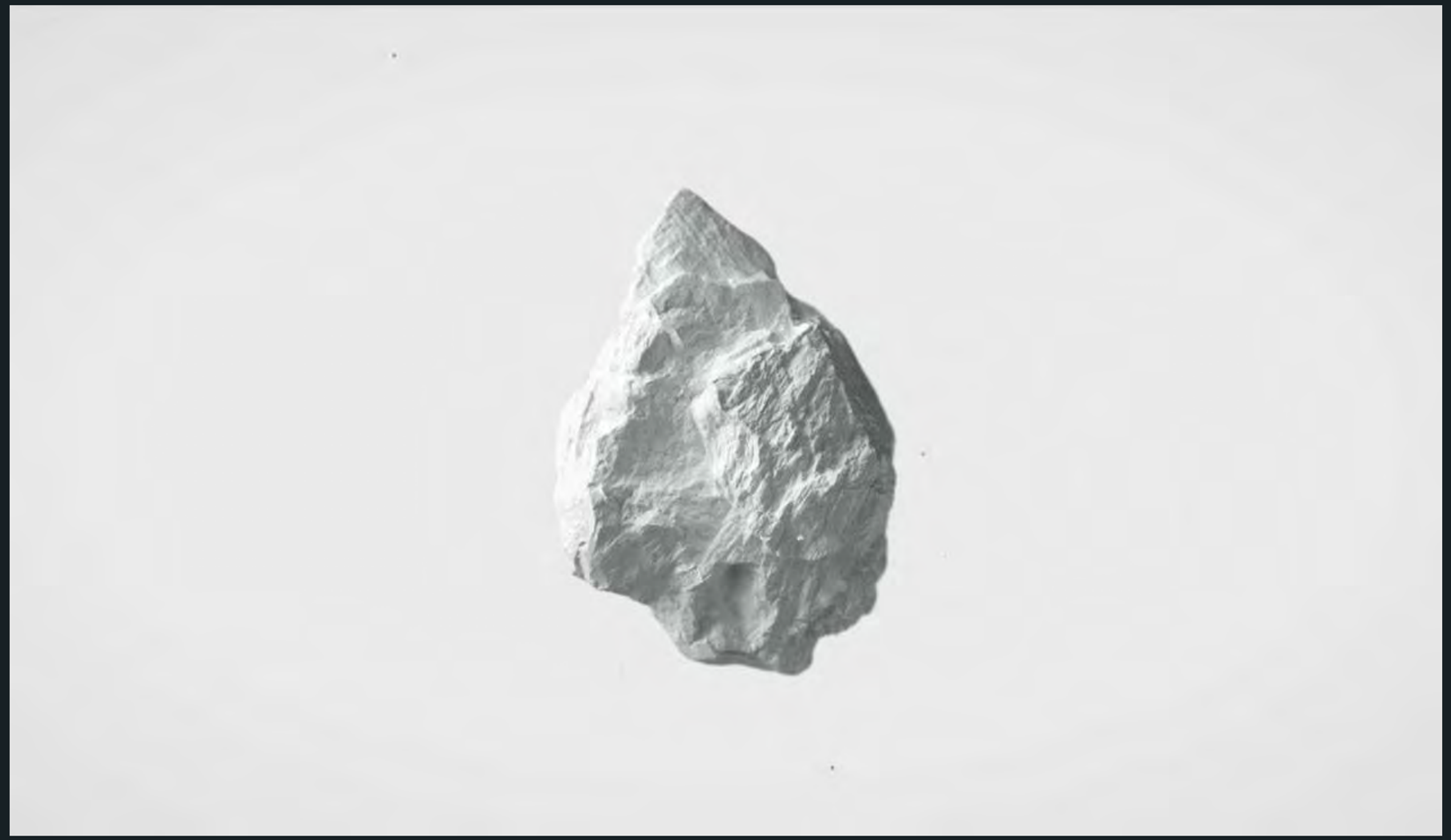
Drone footage of our Halloysite Hills Deposit

Click to Play Video

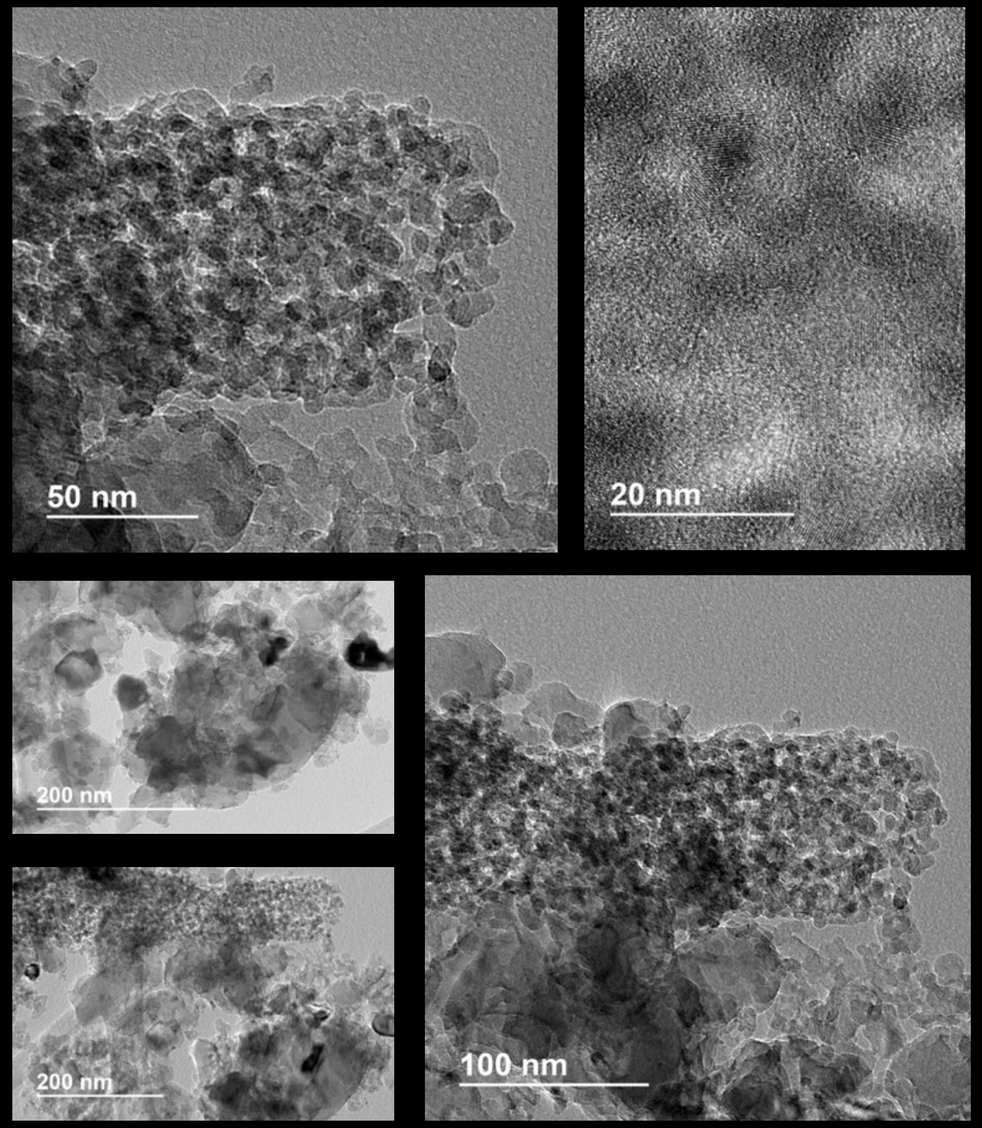
Appendix 1:



Click to Play Video

Appendix 2:

In 2021, our first batch of halloysite-derived nano-silicon was submitted to Argonne National Labs for testing



SEM/TEM

100g Batch Final: Ionisil™ Silicon Material
Tested by Argonne National Labs