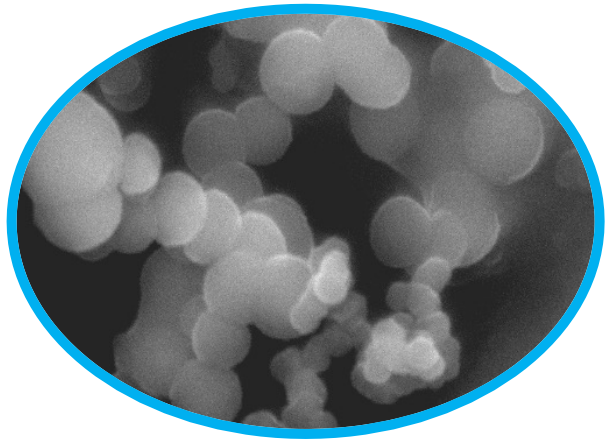
Innovative Silicon Solutions

FROM QUARTZ

HIGH PURITY SILICON



NANO SILICON

HPQ – SILICON
RESOURCES

OCTQX: HPQFF
TSX-V: HPQ

DISCLAIMERS

This presentation includes certain

"FORWARD-LOOKING STATEMENTS"

All statements, (other than statements of historical fact included herein), including, without limitation, statements regarding future plans and objectives of the company, are forward-looking statements that involve various risks, assumptions, estimates and uncertainties, and any or all of these future plans and objectives may not be achieved.

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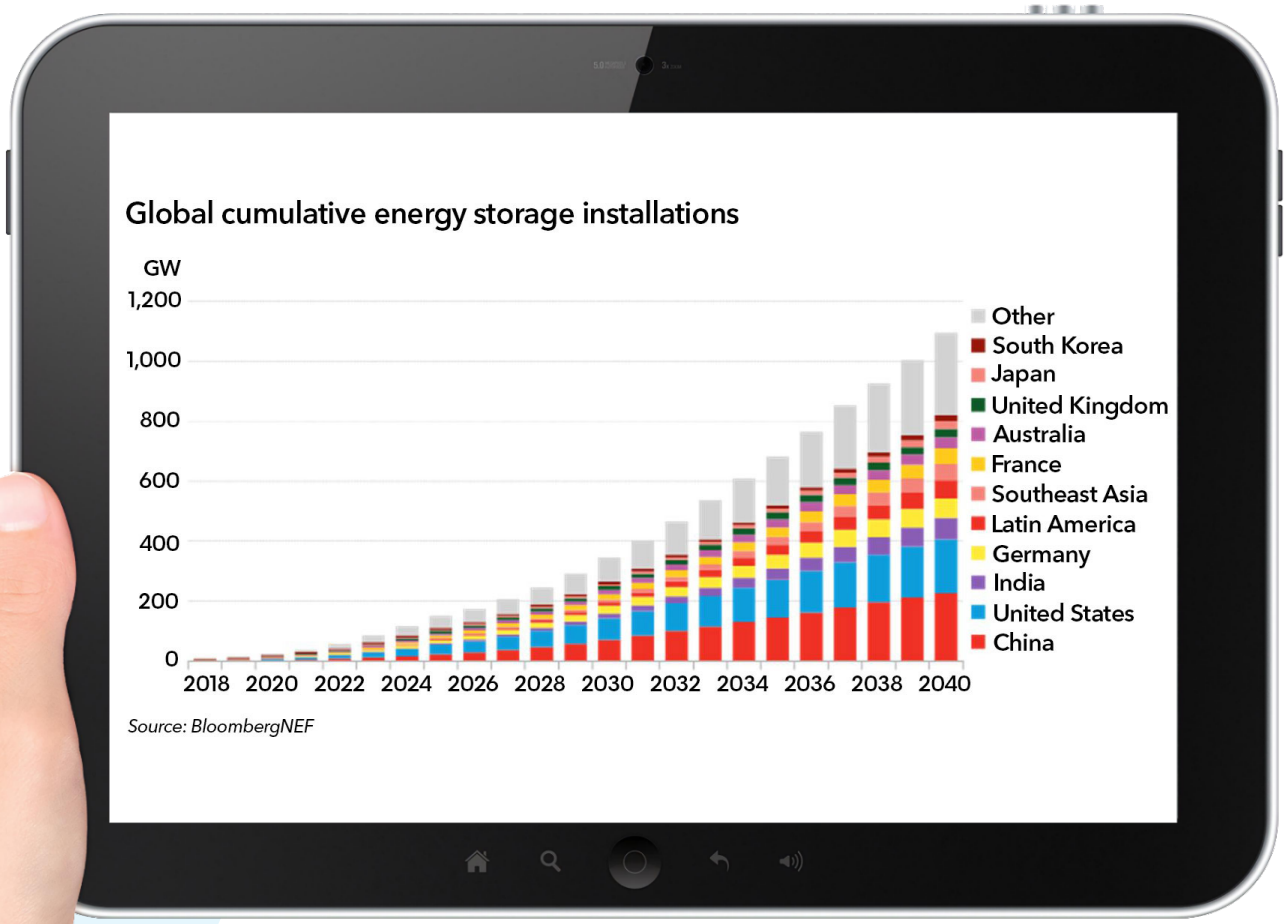
The Corporation is focused on developing the *PUREVAP™ processes. The PUREVAP™ Quartz Reduction Reactor (QRR),* (Patent Pending) a new carbothermic process to transform Quartz into Silicon, and the *PUREVAP™ Nano Silicon (Si)* Reactor (NSiR), (Provisional Patent applied) a new process to transform Silicon (Si) into Spherical Nano powders and Nano wires for Lithium-ion batteries. The terms Silicon, Silicon Metal and Si are used interchangeably. Metallurgical Grade Silicon or Mg Si refers to Silicon Metal of a purity between 98.0% Si and 99.5% Si.

Any monetary values given to end product produced by the equipment, projected capital or operating cost and savings associated with the development of process should not be construed as being related to establishing the economic viability or technical feasibility on any of the Company's quartz properties or more specifically the Roncevaux Quartz Project, Matapedia Area, in the Gaspe Region, Province of Quebec.

ENERGY STORAGE DEMAND ABOUT TO EXPLODE

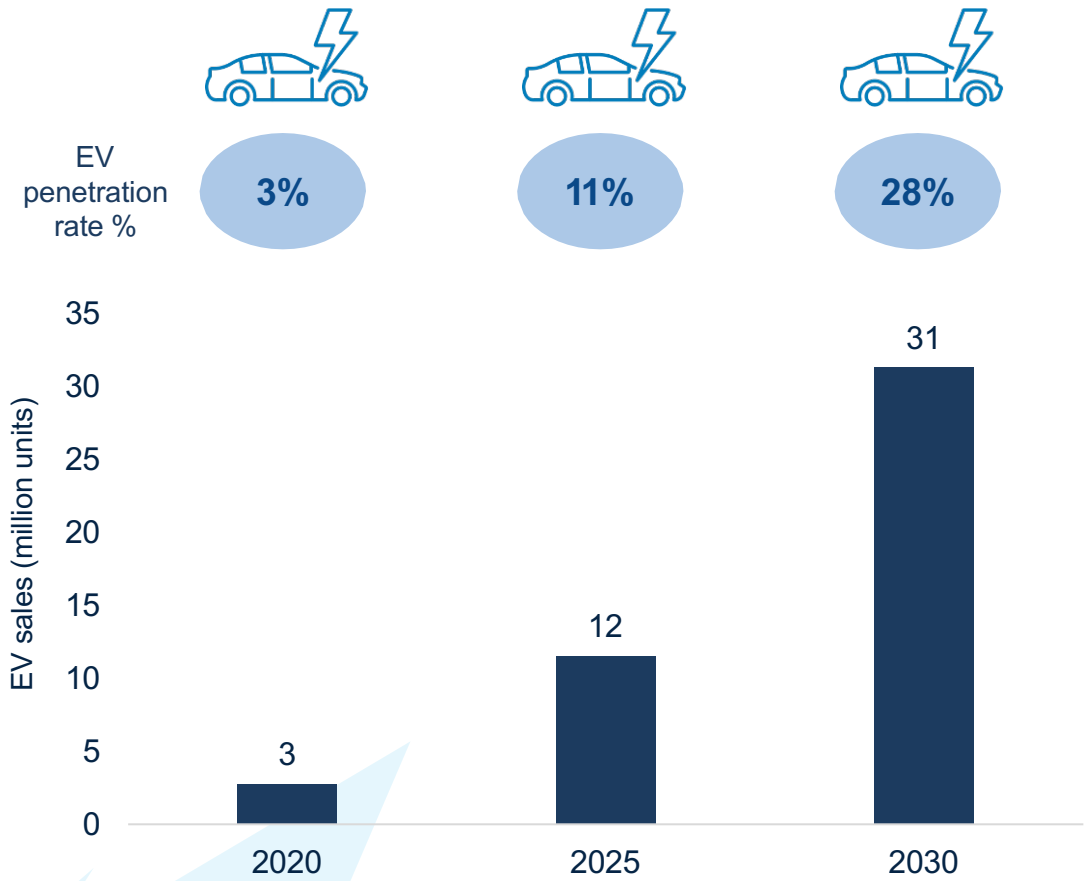
ENERGY STORAGE CAPACITY MUST INCREASE TO OFFSET THE VARIABILITY OF RENEWABLE ENERGY



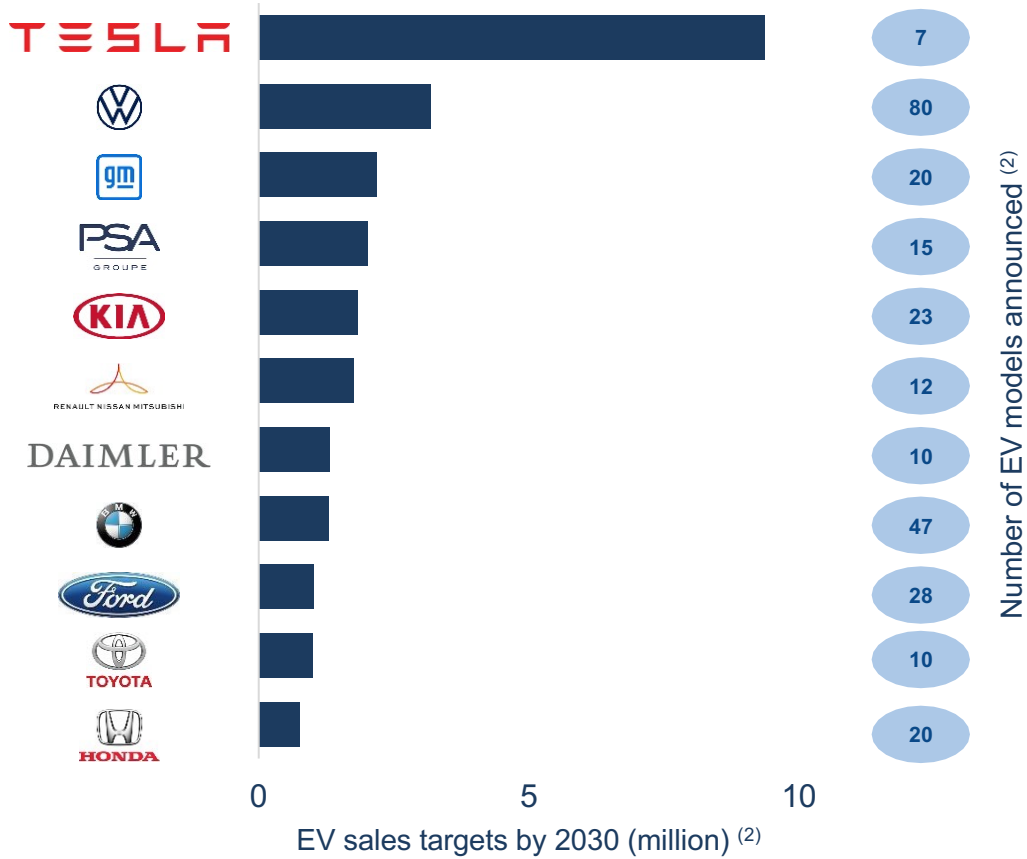
"Investment dedicated to energy storage will exceed $40 billion by 2040 "
Yayoi Sekine, energy storage analyst for BNEF

WE ARE ONLY AT THE START OF A LONG-TERM EV MEGATREND

EV adoption and vehicle sales (1)



Leading EV manufacturer plans – over $300 billion committed



The World is going "all-in" on electric vehicles

(1) Source: Benchmark Mineral Intelligence, Rho Motion
(2) Broker research, Bloomberg New Energy Finance, NOU websites and presentation

BUT THERE IS A “BATTERY BOTTLENECK”

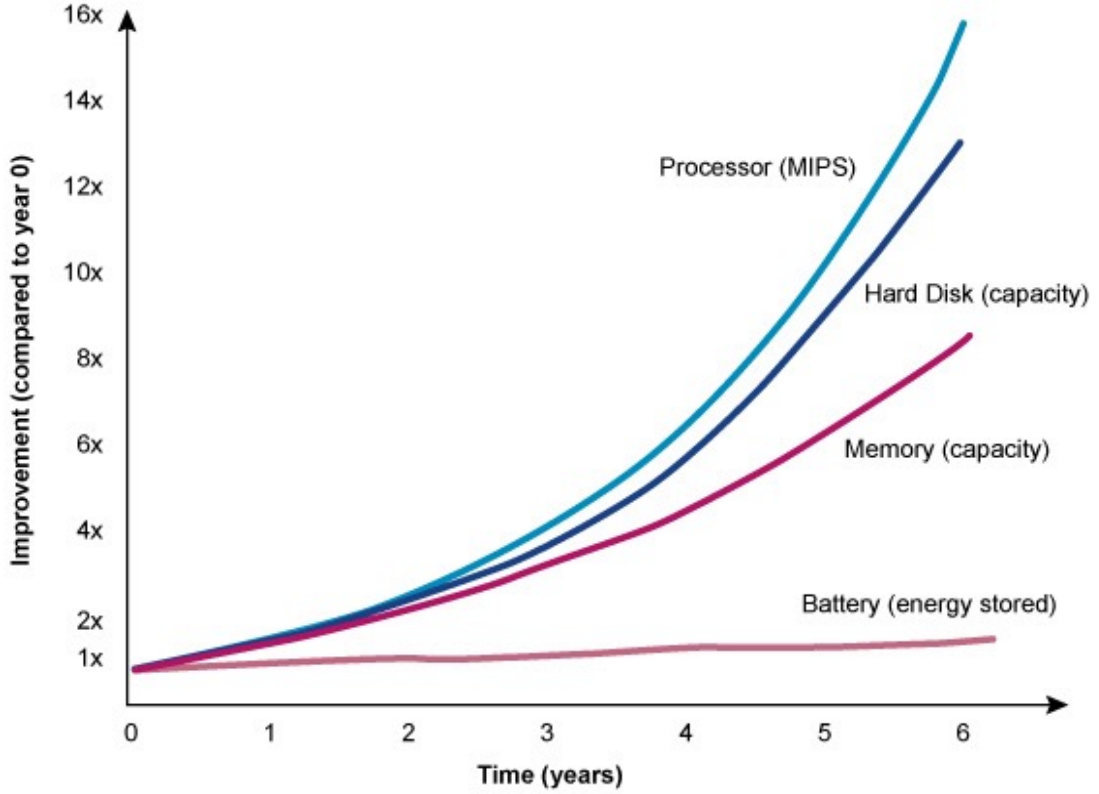
BATTERY PERFORMANCE HAS EVOLVED MUCH MORE SLOWLY THAN ELECTRONICS AND COMPUTERS

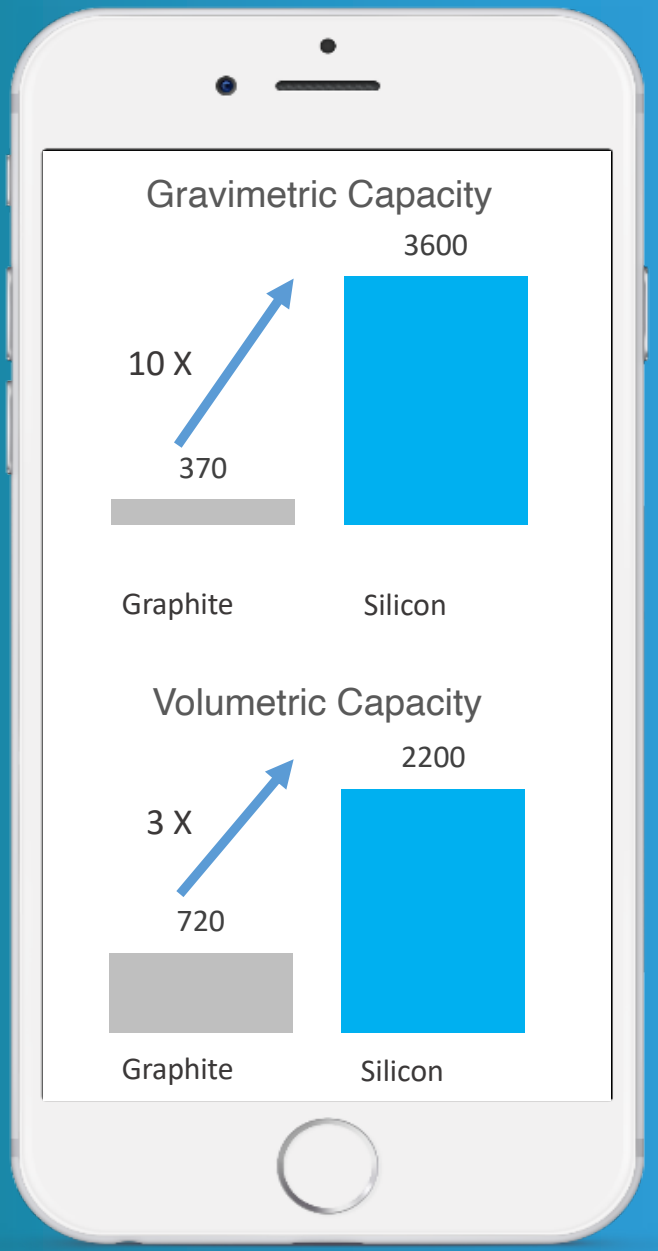
Improvements have been made in battery technology, but they have not kept pace

WHY IS BATTERY TECHNOLOGY EVOLVING SO SLOWLY?

Batteries have evolved differently than electronics:

- **Electronics improve by shrinking physical circuits** enabling manufacturing technology to evolve rapidly.
- **Batteries improve by advances in CHEMISTRY & MATERIALS SCIENCE**.
- Many of the chemical processes used in modern batteries have reached their limits
- **IMPROVEMENTS IN MATERIALS SCIENCE ARE REQUIRED**





BREAKTHROUGHS IN MATERIALS SCIENCE

LITHIUM-ION BATTERIES CAPACITIES ARE LIMITED BY GRAPHITE

- In conventional batteries, the negative electrode or anode is made of carbon in the form of graphite.
- **Graphite** is batteries limiting factor.
- Silicon allows for faster charging and higher storage capacity than graphite.

THIS IS WHY SILICON (Si) IS NEEDED TO BREAK LI-ION BATTERIES' LIMITATIONS

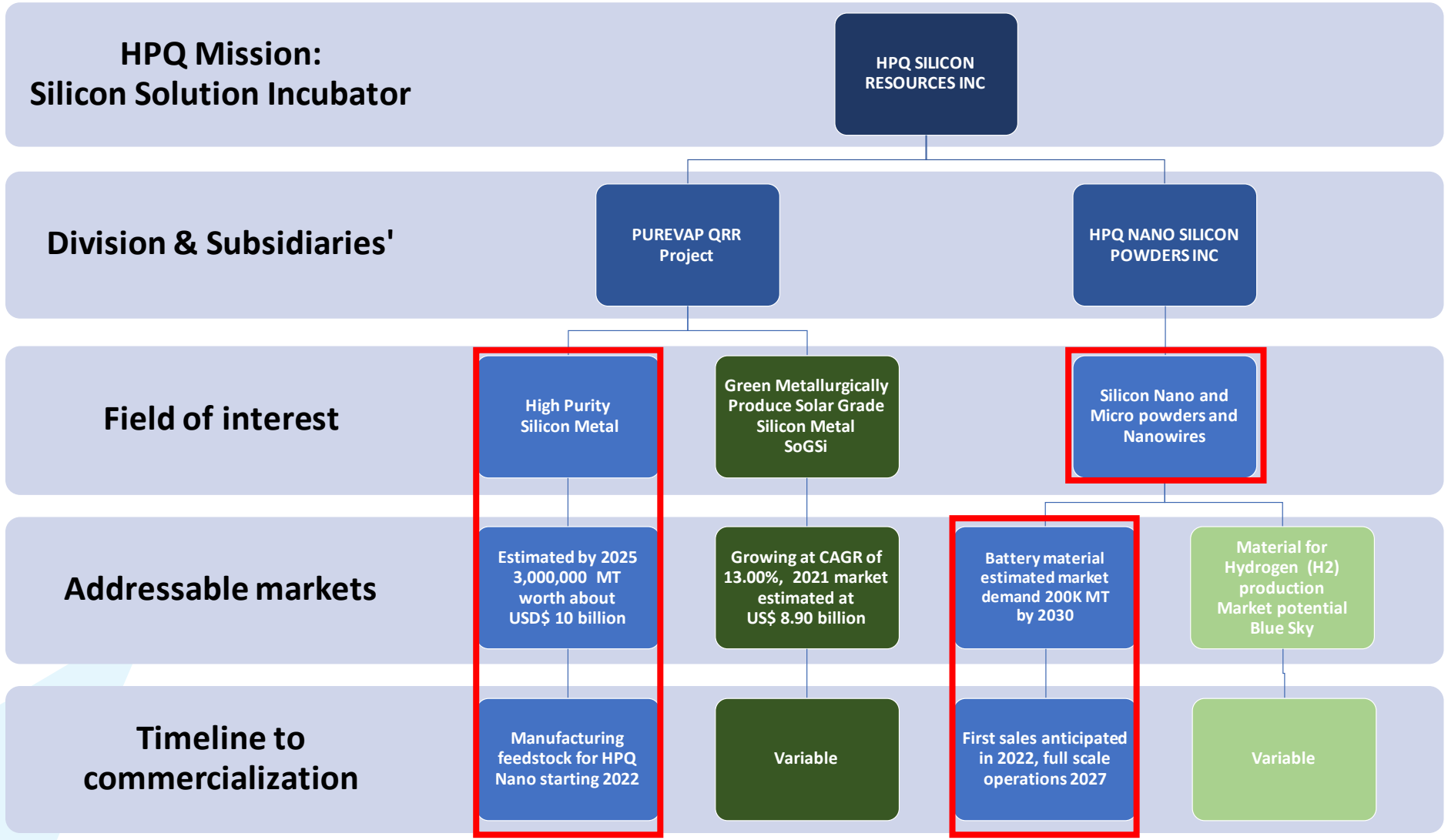
*"**Silicon anodes** are generally viewed as the next development in lithium-ion battery technology … **Silicon**'s ability to absorb more charge translates to longer battery life and smaller batteries."*

(Yury Gogotsi, Director, A.J. Drexel Nanomaterials Institute, Drexel University)

HPQ SILICON PROVIDING BATTERY SOLUTIONS

- Since 2015 HPQ has implemented a Silicon Innovation Strategy
- Currently advancing development of numerous silicon products
- Creating silicon products to resolve Material Science issues
- Breakthrough imminent with Nano Silicon for battery anodes
- Cost effective silicon solution for EV and battery manufacture
- HPQ is one the rare advanced Silicon solution that is public

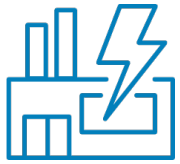
HPQ VALUE PROPOSITION: COMMERCIALIZE AND MONETIZE



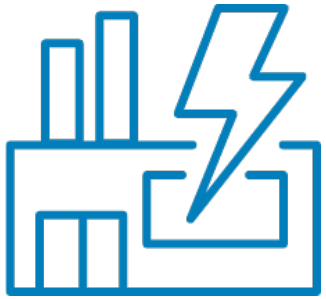
GROWTH IN THE EV MARKET TO DRIVE STRONG DEMAND FOR ALL BATTERY MATERIALS

Recent increased # of Megafactories

January 2020: 121

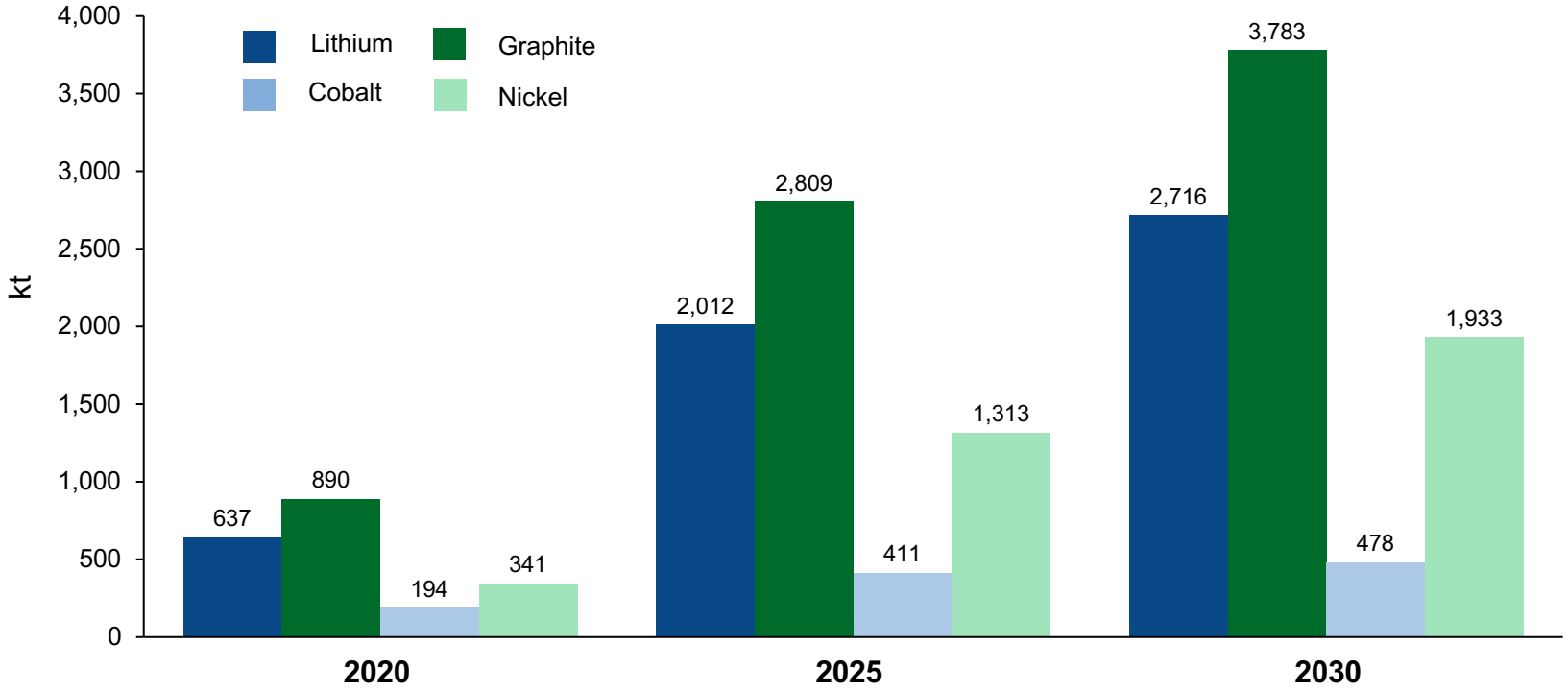


March 2021: 199



Growth = 64%

Raw material demand vs global lithium-ion cell / Megafactory capacity

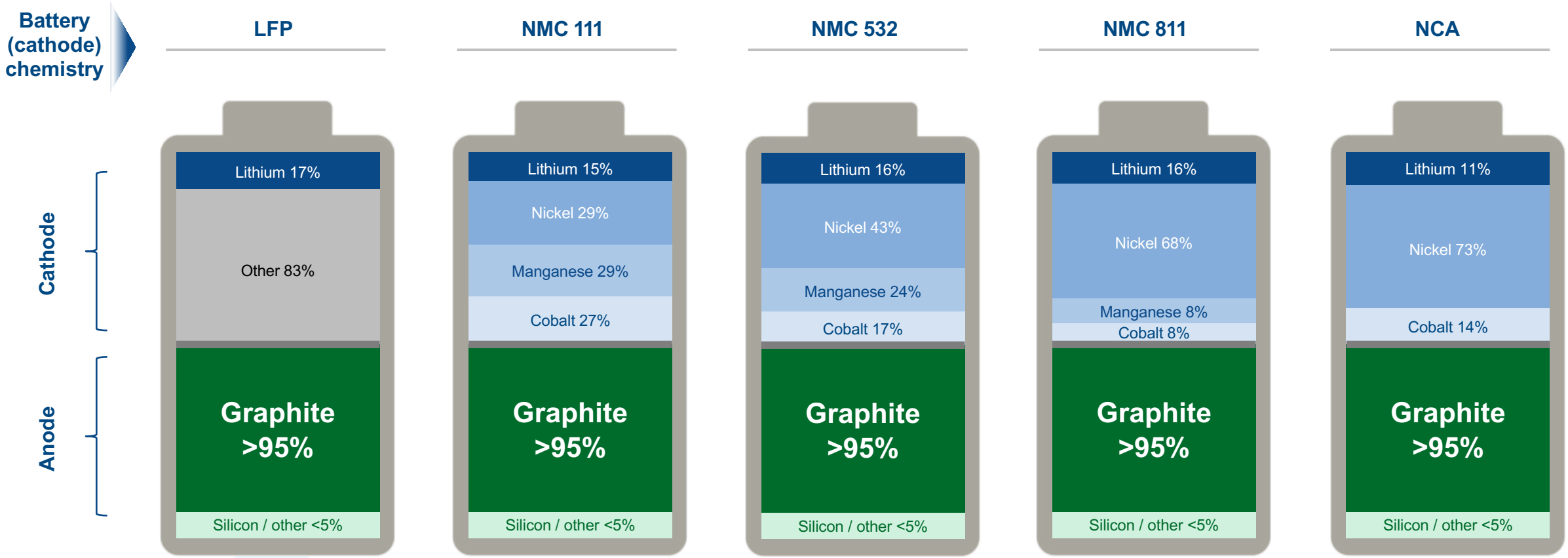


	2020	2025	2030
Battery cell capacity	742 GWh	2,341 GWh **(+216%)**	3,153 GWh **(+383%)**

As the number of Megafactories increases, battery material demand is forecasted to grow significantly by 2030

Source: Benchmark Mineral Intelligence, January 2021
NOU websites and presentation

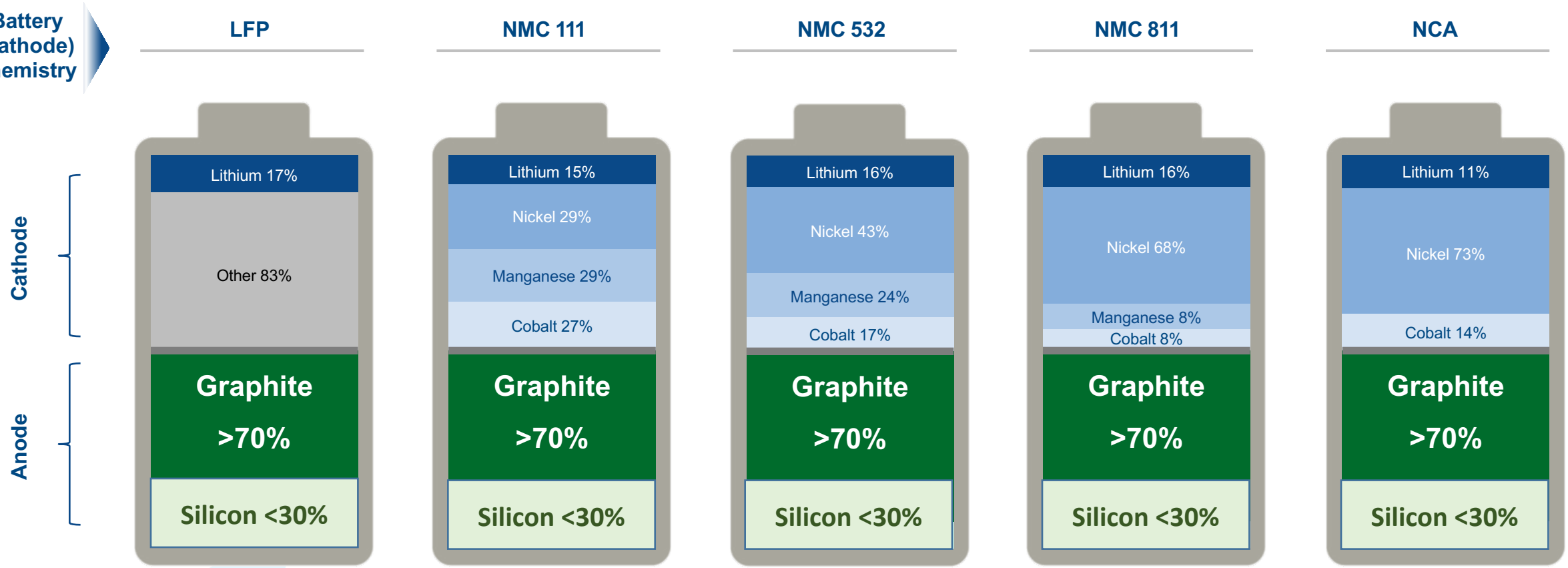
TODAY: GRAPHITE IS FUNDAMENTAL TO RECHARGEABLE BATTERY ANODES



Graphite dominates half the lithium-ion battery – BUT THE WORLD NEEDS BETTER BATTERIES

Source: Pallinghurst-Traxys battery analysis. %s represent the proportions of cathode and anode in each battery respectively. NCA batteries contain 2% aluminium (not shown), NOU websites and presentation

BY 2030 ANODES MAY CONTAIN UP TO 30% SILICON – A MASSIVE DEMAND



Battery Grade Silicon demand will surpass 200K MT by 2030 –
SO THE QUESTION BECOMES: WHO CAN MAKE THAT MATERIAL IN QUANTITY?

Source: Modified NOU presentation and Roskill

AUTO MANUFACTURERS PIVOTING TOWARD SILICON

*Tesla's latest battery day presentation confirmed that the future of battery anodes will include Silicon. Tesla "…**plans on removing graphite from the anode**."*
(NBCFM September 23, 2020 Research Flash)

Porsche is researching high-performance batteries with silicon instead of graphite anodes in order to achieve an even higher energy density and better fast-charging capability.

*"The battery cell is the combustion chamber of tomorrow," says Oliver Blume, Chairman of the Executive Board of Porsche AG. "Our electrified high-performance sports and racing cars place the highest demands on battery technology. To meet these demands, Porsche needs special high-performance cells. **Silicon has big potential**."*

The company made this announcement at the first Volkswagen Power Day, held on March 15 2021

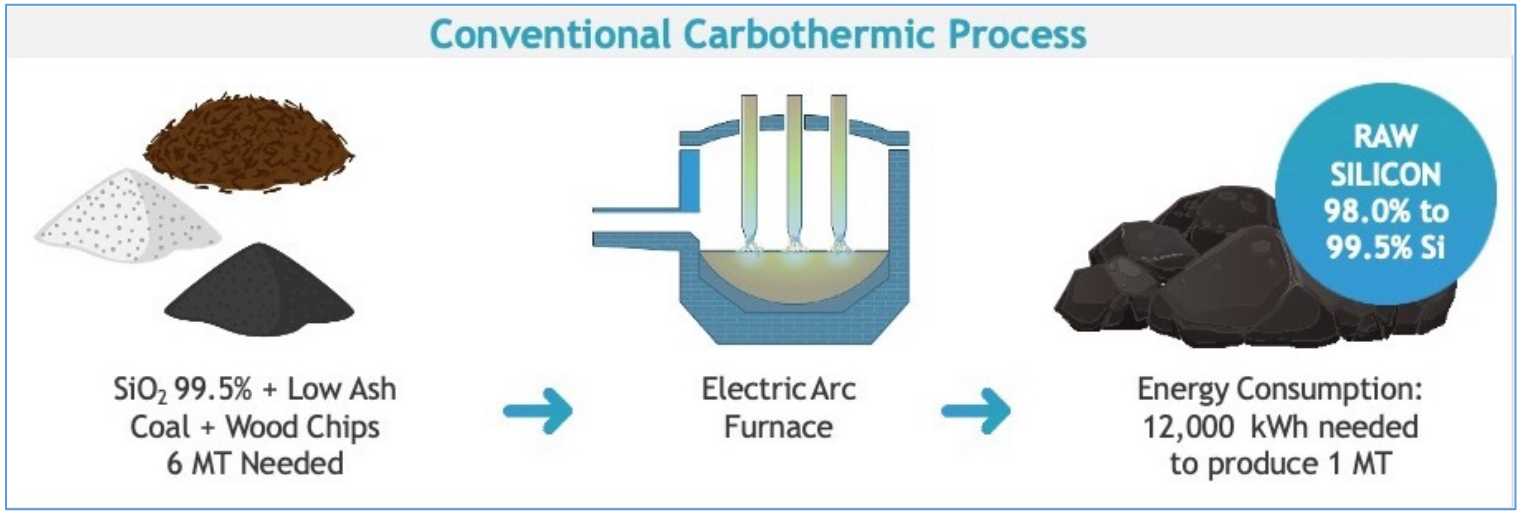
*General Motors Co, President Mark Reuss said at an investor conference held Wednesday April 7 2021, that GM is experimenting with **silicon-rich** and lithium metal anodes, solid state and high voltage electrolytes, and dry processing of electrodes for its next generation of Ultium batteries, due around 2025. (Reuters April 08, 2021)*

SILICON ATTRACTIVENESS

YES, SILICON IS AWESOME, BUT INEXPENSIVE? NOT REALLY

Silicon may be the most abundant element in earth's crust after oxygen, but like all other energy metals (lithium, graphite, cobalt, nickel and others):

- It does not exist in its pure state!
- Expensive carbothermic process needed to extract it from Quartz



RAW SILICON MUST BE ENGINEERED BEFORE IT CAN BE USED FOR BATTERY APPLICATIONS

THE CHALLENGES

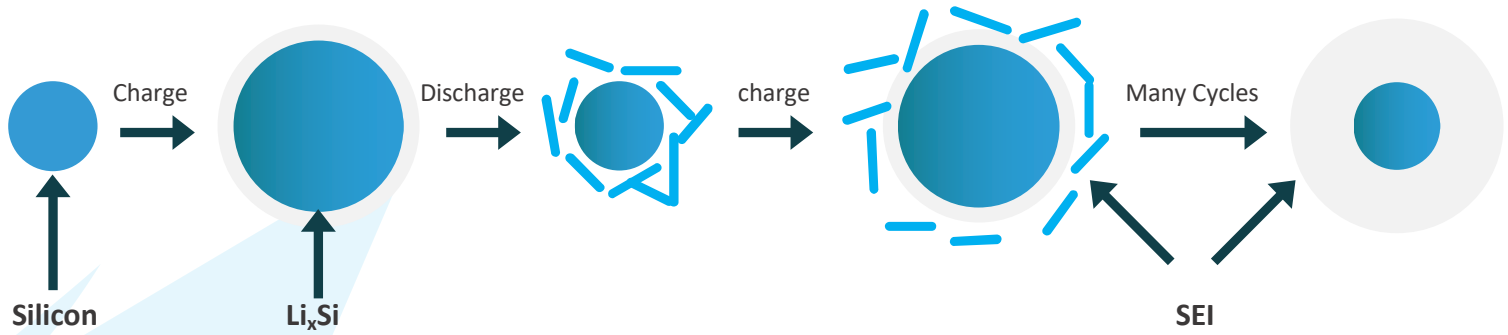
DEPLOYMENT OF SILICON (Si) IN BATTERIES FACES CHALLENGES

THE BIG ONE

- The volumetric fluctuations (>300 %) of Silicon (Si) during charge/discharge cycles leads to irreversible energy storage capacity loss.

WHY

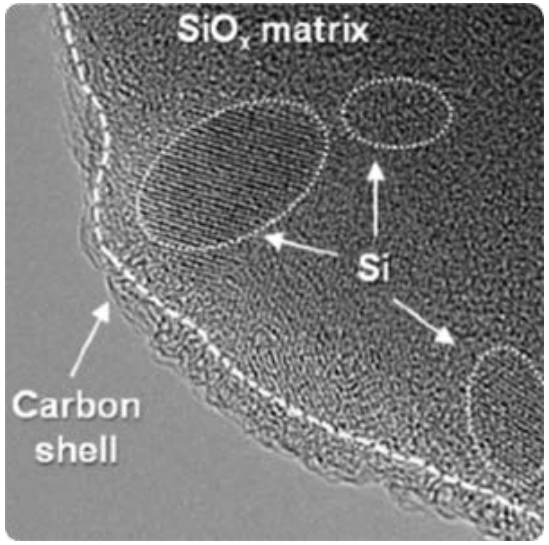
- Repeated exposure of the fresh silicon surface to battery electrolyte leads to a continual reformation of the Solid electrolyte interphase (SEI);
- Basically, the SEI grows thicker with each charge/discharge cycle.



RESULTING IN POOR BATTERY LIFE CYCLE

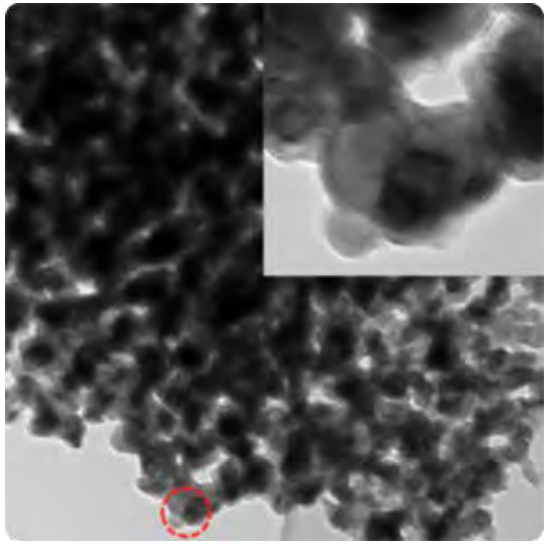
CHALLENGE: ECONOMICALLY VIABLE SOLUTION

CURRENT APPROACHES TO SILICON USE HIGHLY ENGINEERED AND EXPENSIVE MATERIALS



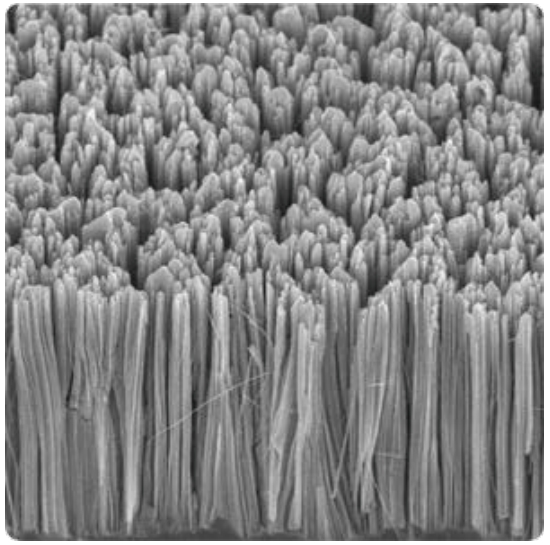
SILICON STRUCTURED IN SIO GLASS

> 2,000 US$ / Kg



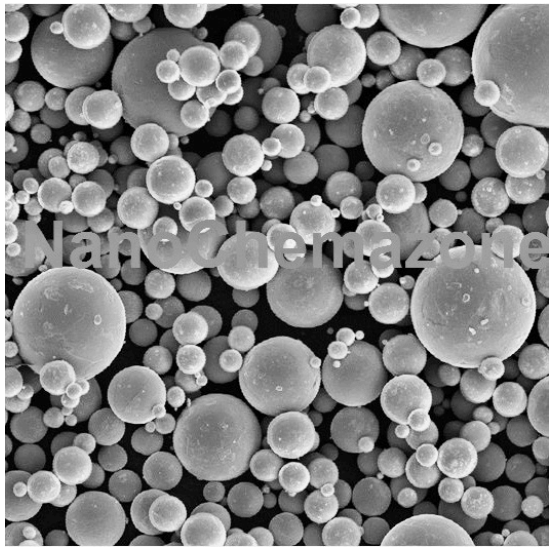
SILICON STRUCTURED IN GRAPHITE

> 3,000 US$ / Kg



SILICON NANOWIRES

> 30,000 US$ / Kg



SILICON NANOPOWDERS

> 20,000 US$ / Kg

Presently:

- Silicon is used in a blended form with graphite
- Typically only represents around 5% by wt
- Limiting performance improvements achieved to date

Silicon Nanopowders or Nanowires could replace graphite now

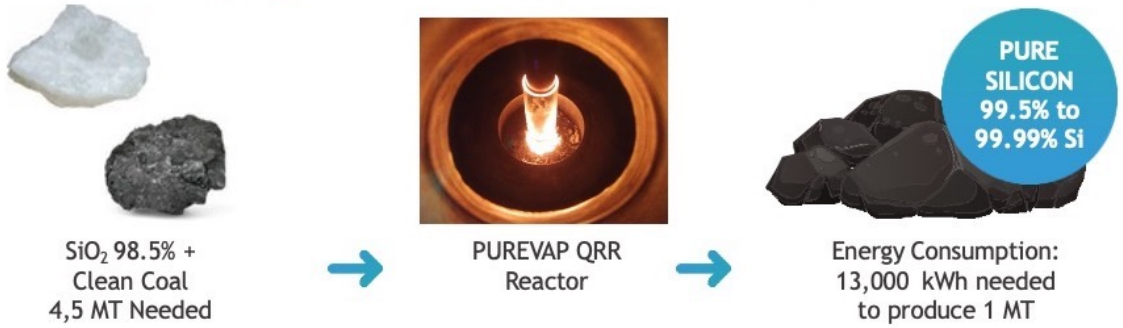
- But a new manufacturing process must be develop to allow Si Nano material to reach cost parity with graphite…
- Graphite for anode cost from US$10 to US$20 per Kg

HPQ - DEVELOPING LOW-COST SOLUTIONS

STARTING COMMERCIAL VALIDATION OF LOW-COST PROCESSES TO MAKE AND TRANSFORM SILICON

HPQ is developing:

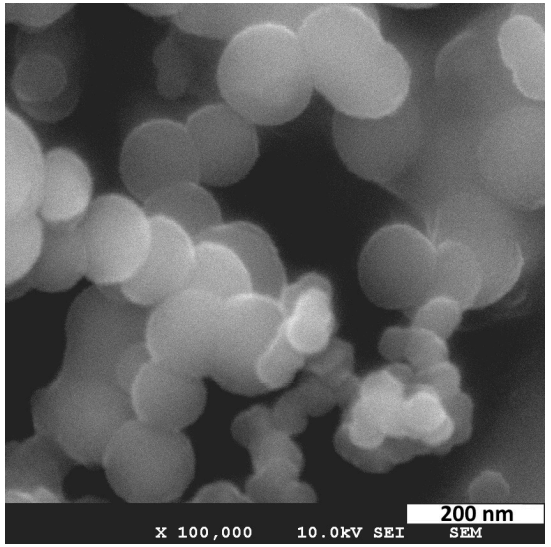
Quartz (SiO_2) to Raw Silicon (Si) - PUREVAP™ QRR Process



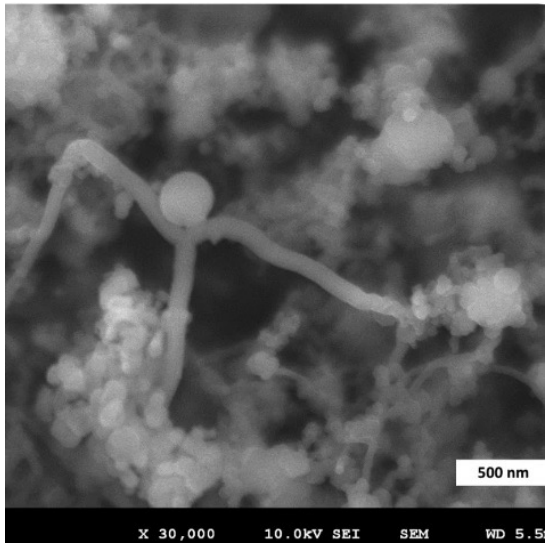
A new scalable, versatile, low CAPEX & OPEX carbothermic process

SILICON (Si) to NANOPOWDERS AND NANOWIRES - PUREVAP™ NSiR Process

A new scalable, versatile, low-cost plasma process with a capability to produce tailor made spherical Si materials from < 0.10 µm up to 5 µm



SILICON NANOPOWDERS



SILICON NANOWIRES

Material produced by PyroGenesis during proof of concept test

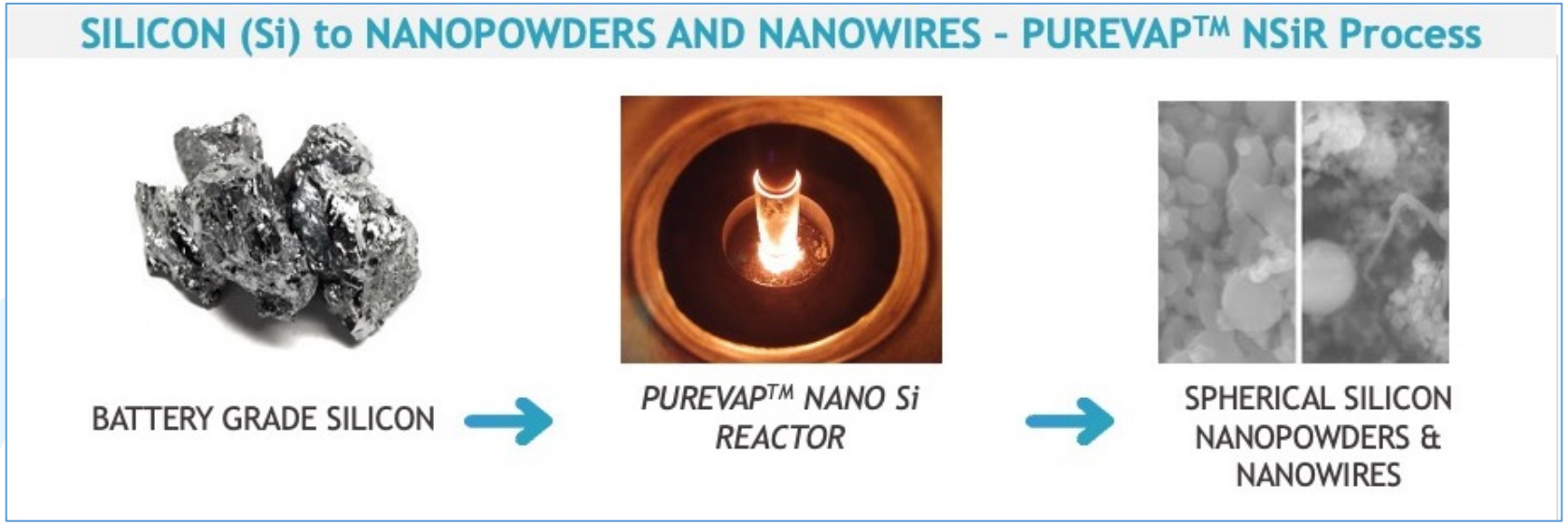
HPQ is also looking into:

- Using *PUREVAP™ QRR* Silicon (Si) as feedstock to produce added value products.
- Exploring the technical and commercial potential of using silicon nano powders made by the *PUREVAP™ NSiR* to produce hydrogen by hydrolysis.

SOLVING THE SILICON PUZZLE FOR BATTERIES

HPQ NANO WITH PYROGENESIS HPQ NANO *PUREVAP™ NANO Si REACTOR (NSiR)*

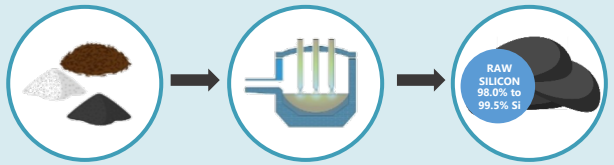
- With more than 20 years of experience developing and using plasma atomization to make metal powders for 3D printing PyroGenesis technical team is developing the *PUREVAP™ Nano Si Reactor (NSiR).*
- The *PUREVAP™ NSiR is* a new low-cost plasma based process that can transform the battery grade Silicon made by HPQ *PUREVAP™ Quartz Reduction Reactor (QRR)* into the nano **Silicon materials that battery and Electrical vehicle manufacturers** are looking for.
- **Our goal: achieving cost parity with graphite making Silicon material from < 0.10 µm up to 5 µm.**



HPQ LOW-COST SOLUTIONS VS COMPETITION

CONVENTIONAL CARBOTHERMIC PROCESS

QUARTZ TO SILICON



99.5% SiO_2 + Low Ash Coal + Wood Chips 6 MT Needed

Electric Arc Furnace

Energy Consumption: 12,000 kWh needed to produce 1 MT

SILICON TO SILANE GAS PROCESS

REC SILICON

2N Si

Dissolved in

Forms

SiCl4

Silicon tetrachloride

add

H_2

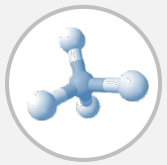
To Get

HSiCl3

Trichlorosilane

Refined 3 time

SiH4



Silane Gas

PUREVAP™ QRR PROCESS

QUARTZ TO SILICON

98.5% SiO_2 + Clean Coal 4,5 MT Needed

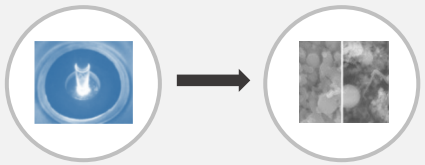
PUREVAP QRR Reactor

Energy Consumption: 13,000 kWh needed to produce 1 MT

PUREVAP™ NSIR PROCESS

SI TO NANO SI

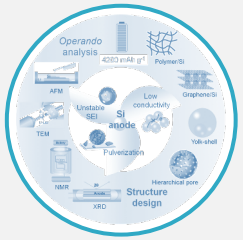
Battery Grade Si



PUREVAP NANO Si Reactor

Si NANOPOWDERS & NANOWIRES

Si Anode Materials

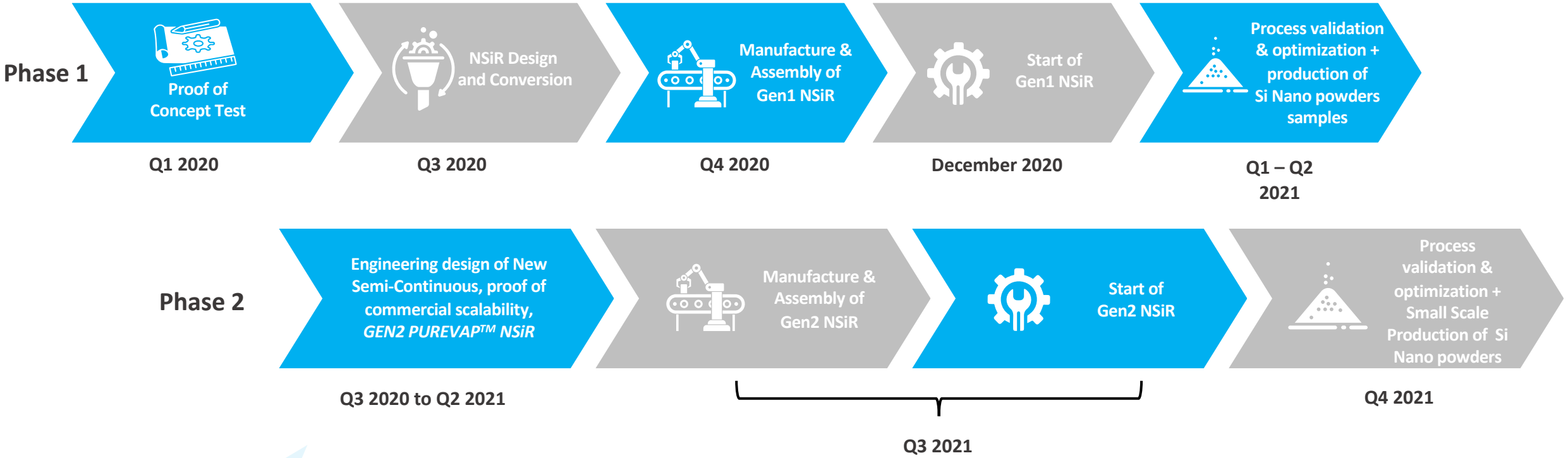


Cell / Battery manufacturing

Next Generation Silicon Anode Manufacturing (Group14 Technologies)

PUREVAP™ NSiR NEAR TERM PATHWAY

PROJECT MILESTONES AND INDICATIVE TIMELINE



Phase 3

Start of Engineering design of a Semi-Continuous *GEN3 PUREVAP™ NSiR Pilot Plant*

From Q4 2021

PUREVAP™ NSiR SCALABLE & LOW-COST

Indicative Scaling-up Pathway

Proof of concept
GEN2 QRR

Phase 1
Bench Tests
Gen 1 NSiR

Phase 2
Proof of Commercial Scalability
Gen 2 NSiR

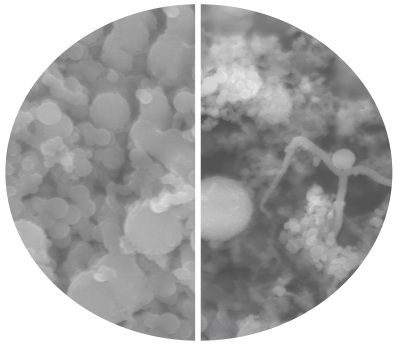
Phase 3
Pilot Plant
Gen 3 NSiR

Phase 4
Commercial Plant
Gen 4 NSiR

Batch Process

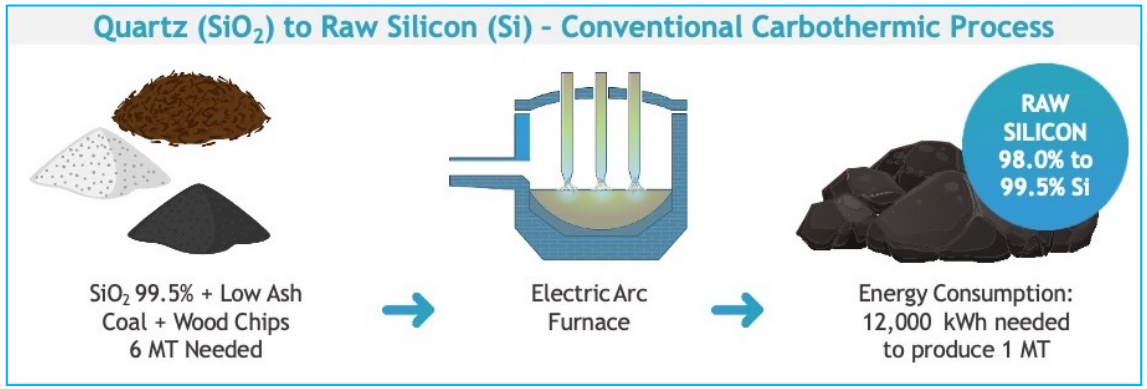
Semi-Continuous Processes

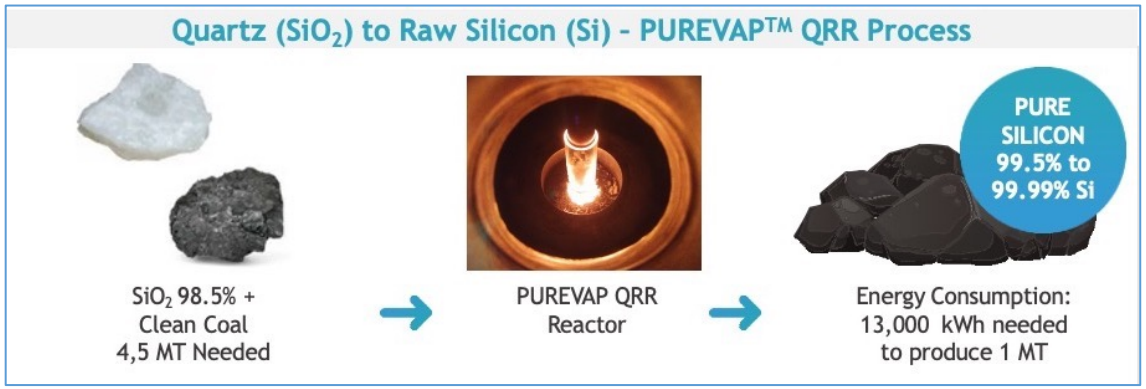
Design Capacity	Traces	50 Kg per Month	500 kg per Month	5,000 kg per Month	200 MT per Month



PUREVAP™ QRR – HPQ FUNDAMENTAL ADVANTAGE

THE PUREVAP™ QRR: GAME CHANGING VERSATILITY VERSUS CONVENTIONAL PROCESS





PUREVAP™ QUARTZ REDUCTION REACTOR (QRR) SCALABILITY AND CAPEX ADVANTAGES:

- New conventional plants are scalable by minimum increments of 30,000 MTY
  - Conventional plant set-up limits 2N+ Si production at 40% of plant output
- *PUREVAP™ QRR* process is scalable by increments of 2,500 MTY
- *PUREVAP™ QRR* match the CAPEX per Kg costs of Tier 1 producers for less investment (85% - 90% less)
  - *PUREVAP™* QRR CAPEX per Kg of annual capacity reaches US$ 6.22 for a (2) 2,500 MTY Plant
  - Rima Subsidiary, Mississippi Silicon, paid US$ 6.11 per per Kg of annual capacity in 2015 to build a 36,000 MT annual capacity Raw Silicon plant. This represented a > US$ 200M investment

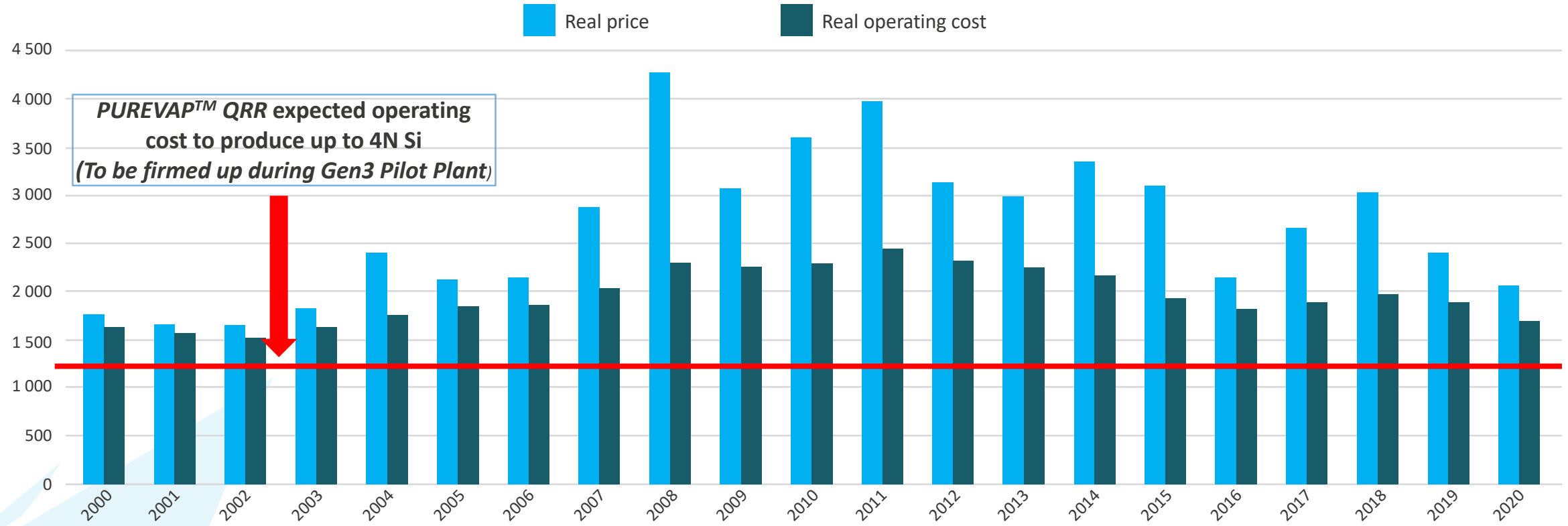
PUREVAP™ QRR – LOW COST, LOW EMISSIONS

PUREVAP™ QRR OPEX VERSUS CONVENTIONAL Si PRODUCERS

Silicon in the 2020s

Inflation-adjusted prices are higher than they were in the early 2000s

US spot price of 5.5.3 grade silicon vs. avg. operating cost at plants outside China and the CIS in real terms, $/t



Data: CRU

HPQ – OTHER SILICON BUSINESS OPPORTUNITIES

Usages

Metallurgical Grade Si (98.0% - 98.9% Si)	Aluminum, Silicones
Chemical Grade Si (99.0% - 99.5% Si)	Silicones, Photovoltaic

Global Megatrends

Megatrends	Implications	End Customer Product
Population Growth	Growing middle class China and India: consumption economy	• Silicones: healthcare, cosmetics, packaging
Urbanization	India, Brazil and other emerging markets: infrastructure build	• Silicon: aluminum for cars, housing growth • Silicon: Silicone sealants for construction
Energy Efficiency	Reduce weight of vehicles and Electric vehicles	• Silicon as alloying agent for aluminum to replace steel in vehicles • Prospects for silicon alloys in batteries
Alternative Energy & Sustainability	Growing demand for solar and other sources of renewable energy	• Silicone sealants for wind turbine and solar • Higher consumption of silicon for polysilicon used to make solar cells • Prospects for silicon Base Energy Storage

DEMAND TO REACH 3.8 M MT WORTH ABOUT US$ 10 BILLION BY 2025 (CRU)

- **NEW PLANTS NEEDED TO MEET DEMAND GROWTH**
- **GROWTH WILL BE DRIVEN BY DEMAND FOR CHEMICAL GRADE SILICON (2N+ Si)**
  - ➢ **Used as feedstock to make Silicones**
    - ❖ **Silicone's market expected CAGR 10.7% (from US$ 14.0 B in 2020 to US$ 23 B by 2025[1])**
  - ➢ **Used as feedstock to produce Polysilicon (for both Siemens and FBR processes)**
  - ➢ **Used as feedstock to make engineered Silicon for battery applications**

Source 1: marketsandmarkets.com

PUREVAP™ QRR – FIVE YEARS IN THE MAKING

INDICATIVE SCALING-UP PATHWAY

Phase 4
Commercial Plant
Gen 4 QRR
2023 -

Phase 2
Proof of Commercial Scalability *Gen 2 QRR*
Completed in 2017

Proof of concept completed in 2016

Phase 1
Bench Tests
Gen 1 QRR
completed in 2016

Phase 3
Pilot Plant *Gen 3 QRR*
Engineering-Design process & financing completed
2018-2019

Phase 3
Pilot Plant
Commissioning and commercialization
2021-2022

Batch Process

Semi-Continuous Processes

Design Capacity

Traces

Grams per Tests

10 kg per Month

4,000 kg per Month

200 MT per Month

WHY INVEST IN HPQ SILICON?

UBS estimates that over the next ten years, the energy storage market in the United States alone could grow to as much as $426 billion, and there are many ways to buy into the surge! (CNBC Dec 30, 2019)

HPQ – SILICON: AN INVESTMENT OPPORTUNITY TO PARTICIPATE IN THE SURGE!

- **Ready to become the lowest cost producer of the nanomaterials needed for the starting renewable energy revolution:**
  - Spherical Silicon Nano & Micron powders for Li-ion Batteries
    - ✓ ***Material potential already generated NDA's with battery manufacturers and advance material companies***
    - ✓ ***Received a firm order for Si Nanopowders from major car manufacturer***
  - Silicon Nanowires for Li-ion Batteries
  - Spherical Silicon Nanopowders for Hydrogen (H_2) production
  - Pure Silicon (99.5% Si up to 99.99% Si) for specialty applications
- **Supported by world class technology partners**

HPQ CAPITAL STRUCTURE

Share Price (April 21, 2021)	$0.790	Cash and Cash equivalent in hand				$ 5,251,176
		Dedicated Cash for PUREVAP™ QRR Pilot Plant				$ 1,950,000
52 Week Low	$0.060	In the money warrants and options				$ 11,017,182
52 Week High	$1.680	TOTAL CASH POSITION				$ 18,218,358
		Warrants Breakdown				
Shares Outstanding:	283,034,559	Expiration Date	Warrant Outstanding	Exercise Price	Potential Cash to HPQ	In the money Cash value
IQ Convertible debenture	16,363,636	Aug-21	31,250,000	0.155	$ 4,843,750	$ 4,843,750
Warrants:	55,891,012	Jan-22	4,152,000	0.155	$ 643,560	$ 643,560
		Jul-22	1,779,412	0.150	$ 266,912	$ 266,912
Options:	6,100,000	Aug-22	200,000	0.150	$ 30,000	$ 30,000
		Dec-22	1,575,000	0.100	$ 157,500	$ 157,500
Fully Diluted:	361,389,207	Apr-23	8,540,000	0.100	$ 854,000	$ 854,000
		Jun-23	4,394,600	0.100	$ 439,460	$ 439,460
Market Capitalization:	$223,597,302	Sep-23	4,000,000	0.610	$ 2,440,000	$ 2,440,000
Market Capitalization (FD):	$285,497,474	TOTAL	55,891,012	0.173	$ 9,675,182	$ 9,675,182

HPQ Share Performance 12 months

MANAGEMENT, BOARD & KEY INVESTORS

Management

Bernard J Tourillon, BAA, MBA
Chairman, President, CEO and Director

Patrick Levasseur
Vice-President, COO and Director

Noelle Drapeau, LLL, MBA, PMP
Corporate Secretary and Director

Francois Rivard
CFO

Major Investors

Management & Board	≅ 6.7%	≅ 7.7% (FD)
PyroGenesis	≅ 8.0%	≅ 11.0% (FD)
Investissement Québec		≅ 8.7% (FD)
Strategic Investors	≅ 4.3%	≅ 3.4% (FD)
Key Investors	≅ 6.6%	≅ 8.1% (FD)

Independent Directors

Richard Mimeau, B.Sc.
Director

Peter Smith, PhD, P. Eng.
Director

Robert Robitaille, M.B.A., L. Ph.
Director

Daryl Hodges H. BSc, M.Sc.
Director

CONSULTANTS, TRANSFER AGENT AND AUDITORS

Consultants/ Technical Advisors

Marcel Drapeau, BA, BSC. Comm, LLL

PyroGenesis Canada Inc

Apollon Solar Sa

Transfer Agent

Computershare

Auditors

KPMG S.E.C.N.R.L.

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