



Performance Through Carbon Chemistry

Industrial
Volume

Proprietary
Technology

Cost
Effective

Forward-Looking Statements

Forward-Looking Statements.

This presentation contains express or implied forward-looking statements, which are based on current expectations of management. These statements relate to, among other things, our expectations regarding management's plans, objectives, and strategies. All statements other than statements of historical fact could be deemed forward-looking, including, but not limited to, any projections of financial information; any statements about historical results that may suggest trends for our business and results of operations; any statements of the plans, strategies and objectives of management for future operations, including the timing, funding and construction of planned manufacturing facilities and sales offices; any statements of expectation or belief regarding future events, potential markets or applications, the sizes of addressable markets, expected technology developments, strategic partnerships and collaborations, or enforceability of our intellectual property rights; any statements about the projected or expected economic or other benefits of our products compared to petroleum-derived equivalents, future sales and any statements of assumptions underlying any of the foregoing.

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Company Snapshot

NanoXplore is a specialty chemical company. We are a manufacturer and supplier of advanced components and solutions based on our proprietary graphene technology. We serve transportation, renewable energy, energy storage and industrial markets.

- We are a public company, headquartered in Montreal, Quebec and trade on the TSX Venture Exchange under symbol "GRA" and on the OTCQX under symbol "NNXPF" (Market Cap ~\$0.5B¹)
- We have the largest graphene production capacity in the world² with a fully automated facility that can produce 4,000-metric tons per year of graphene powder
- We offer graphene based solutions and composite parts for transportation, renewable energy, energy storage, and industrial markets
- We are a global company. We are a group of nearly 400 people and operate 8 production plants in Canada, Switzerland, and the United States, that support graphene production and composite parts manufacturing
- We have strong strategic and institutional shareholders: Martinrea International Inc. (MRE:TSX), one of the largest auto parts suppliers in North America, Fidelity Investments, Investissement Québec, Caisse de dépôt et placement du Québec, BDC CleanTech
- We hold a strong IP portfolio with multiple patents on graphene production, applications in composites and energy storage
- We service multiple Blue-Chip customers, some of which include Volvo Truck, Paccar, GE, Daimler, Volvo Bus, Caterpillar, and Itron

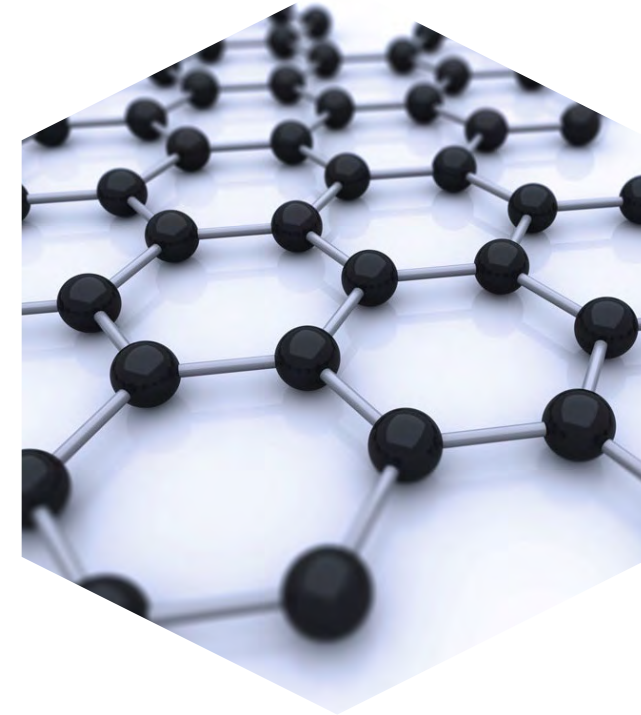
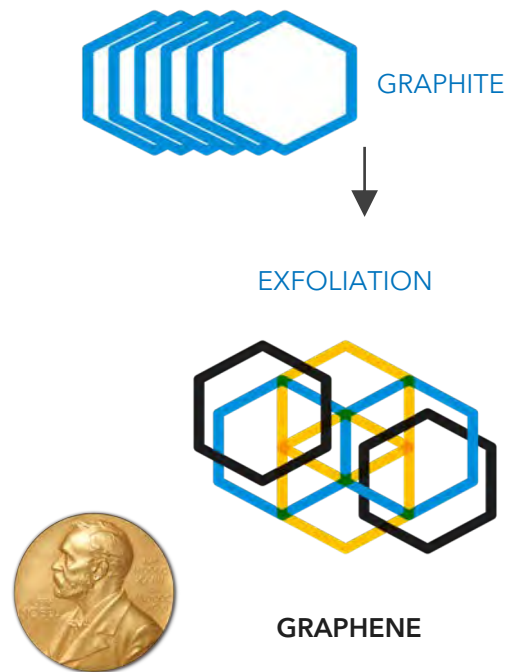
(1) As of Dec. 8th, 2020

(2) IDTechEx Research, Dr. Richard Collins, "Is the Tipping Point for Graphene Commercialisation Approaching?"

What Is Graphene?

Discovered at Manchester University in 2004.
Nobel Prize awarded in 2010

Graphene is pure carbon consisting of carbon atoms arranged in a few-layer honeycomb lattice



Largest Graphene Producer

- A global graphene market leader and largest producer of graphene, being traded on the TSX Venture Exchange under symbol "GRA"
- Currently employs nearly **400** people with **8 production plants** in North America and Europe
- Headquartered in Montreal, QC, Canada



Moving The Market

4,000 ton/yr. Graphene Facility

- We take natural flake graphite (>100,000 layers of carbon) and exfoliate the material via a mechanical-liquid exfoliation process proprietary to NanoXplore
- We produce very consistent and high-quality graphene in volume (6-10 atomic layers in thickness with 96-98% purity)
- Our new, state-of-the-art facility is a significant milestone for the company and the graphene industry



NanoXplore's Current Graphene Offerings

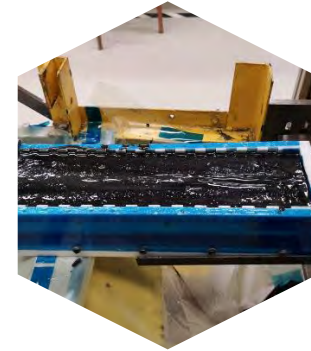
Graphene Powder



Graphene in Thermoplastics



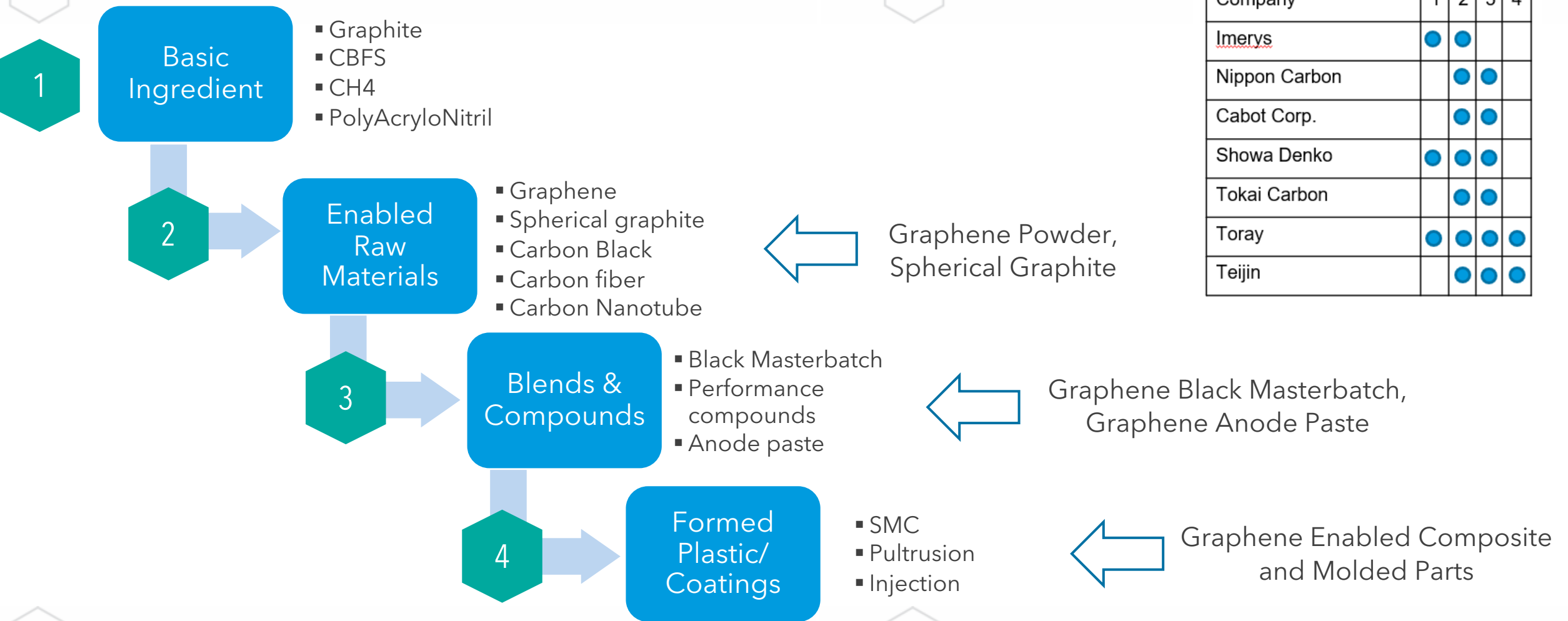
Graphene in Thermosets



Graphene-enhanced Molded Products



Our Business Model



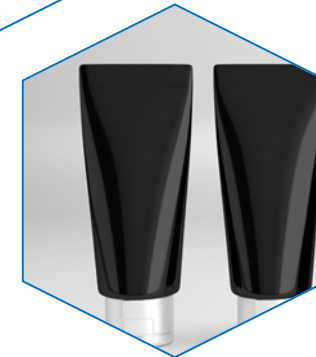
Company	1	2	3	4
<u>Imerys</u>	●	●		
Nippon Carbon		●	●	
Cabot Corp.		●	●	
Showa Denko	●	●	●	
Tokai Carbon		●	●	
Toray	●	●	●	●
Teijin		●	●	●

Graphene Market Applications

Target Industries

- Transportation & Automotive
- Energy Storage & Batteries
- Electronic Enclosures
- Tires & Rubbers
- Paints & Coatings
- Pipes & Tubes
- Consumer Packaging

Graphene is making great strides into multiple industries and verticals with results exceeding expectation.



Examples In Transportation

Truck Hood

Technology: Sheet Molding Compound (SMC)



Compressive Strength



Light weighting

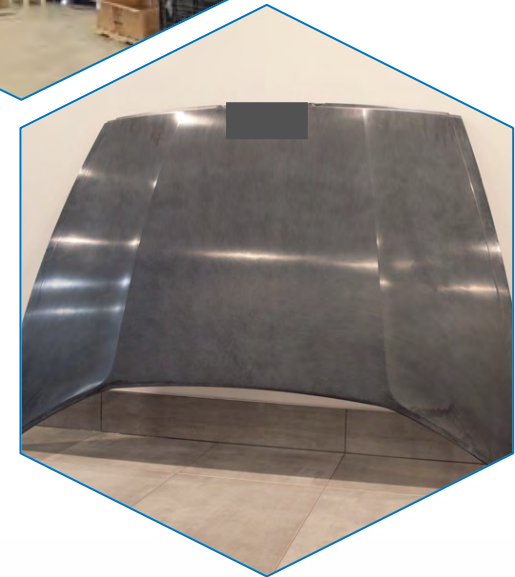


Processability



UV Resistance

Light-weight composite hoods made with graphene demonstrate smoother surface finish compared to traditional ones. Graphene also increases the strength and stiffness of the composite hoods, enabling weight reduction for molded parts.

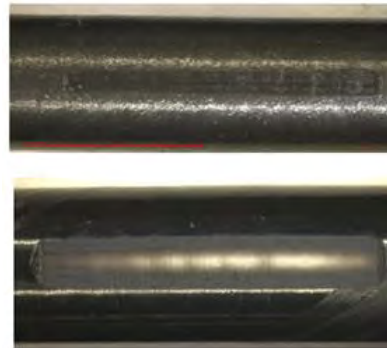


Examples In Transportation

Brake Lines



NanoXplores



Material	Number of abrasion cycles	Improvement
Nylon/Graphene	>150,000	30X



Abrasion Resistance



Extend Lifetime

Examples In Renewable Energy



Windmill Blades



Graphene increases the strength and reduces the weight

Industrial and Agricultural flooring

Examples:

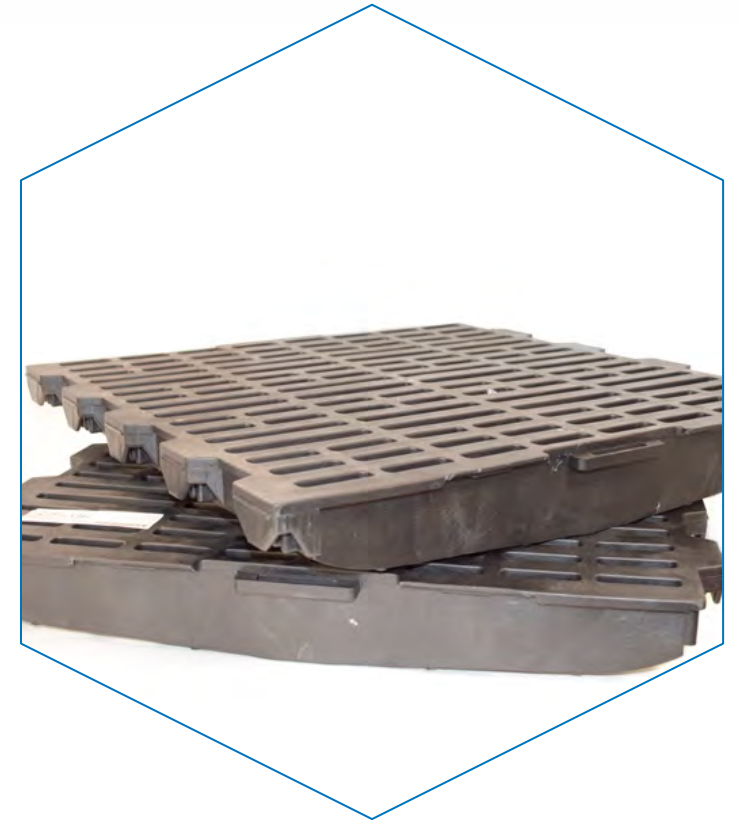


Recyclability

Flooring parts made with 100% recycled plastics

Graphene enables the use of recycled polypropylene without any virgin plastic

Parts are fully recyclable at the end of life



Li-ion Battery Supply Chain

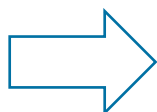


Lithium
Nickel
Iron
Cobalt
Silicon
Graphite
Manganese

Anode
Cathode
Electrolyte
Separator

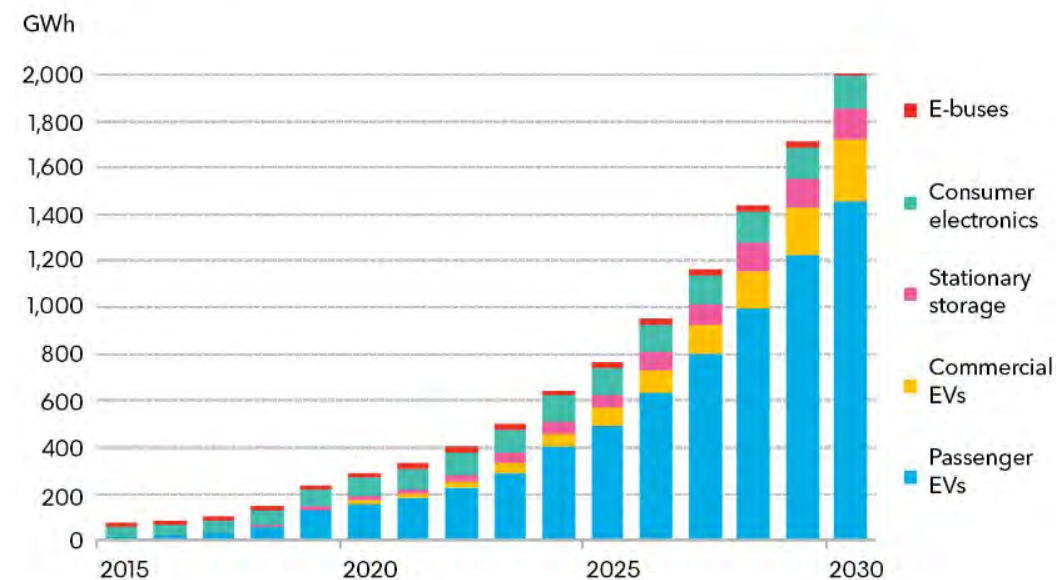
Cylindrical
Prismatic
Pouch

Innovation trend
(in-line with
Tesla battery day
Presentation)



- Move toward larger cylindrical cells (Main challenge is thermal runaway)
- Nickel rich cathode formulation (minimize cobalt consumption)
- Silicon rich anode formulation (minimize graphite consumption)

Annual lithium-ion battery demand



<https://energycentral.com/c/ec/world-battery-production#:~:text=As%20of%20Dec%202019%2C%20the,40%20million%20EVs%20by%202028.>

Graphene As An Additive In Batteries

Additive in **NMC111 cathode**

Material	Discharge Capacity Improvement
Super-P (Carbon Black)	-
Graphene 0X	5%



Extend Lifetime

Improve energy density, charge rate, and cycle life with Graphene

Active material in **anode** (after 70 cycles)

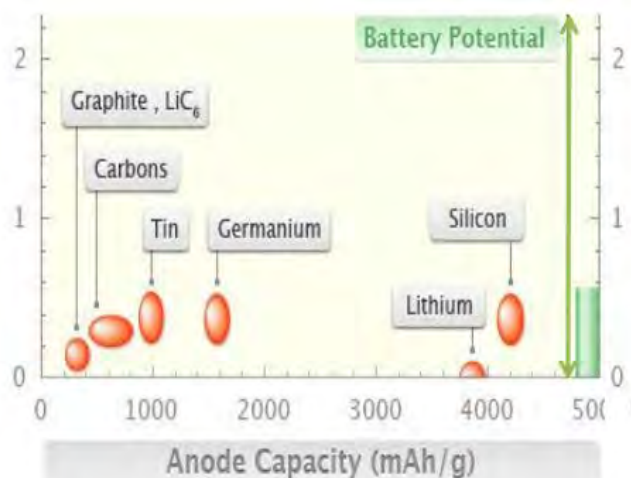
Material	Reversible Capacity
MAGD (synthetic graphite)	340 mAh/g
Graphene 0X	345 mAh/g



Battery cell manufacturing process: https://www.researchgate.net/figure/Manufacturing-steps-of-Li-ion-batteries_fig1_294275605

Silicon Anode

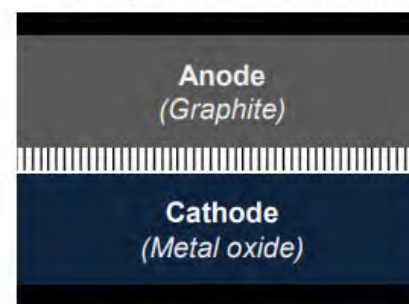
	Graphite	Silicon
Intercalation Reaction	$\text{Li} + 6\text{C} \leftrightarrow \text{LiC}_6$	$4.4\text{Li} + \text{Si} \leftrightarrow \text{Li}_{4.4}\text{Si}$
Potential vs Li/Li ⁺	0.05 V	0.4 V
Gravimetric Capacity	372 mAh/g	4200 mAh/g



- >10x (theoretical) increase in lithium storage capacity
- Vastly abundant
- Environmentally benign
- Well understood from semiconductor industry

Source: Nexeon.co.uk

Current Li-Ion Battery

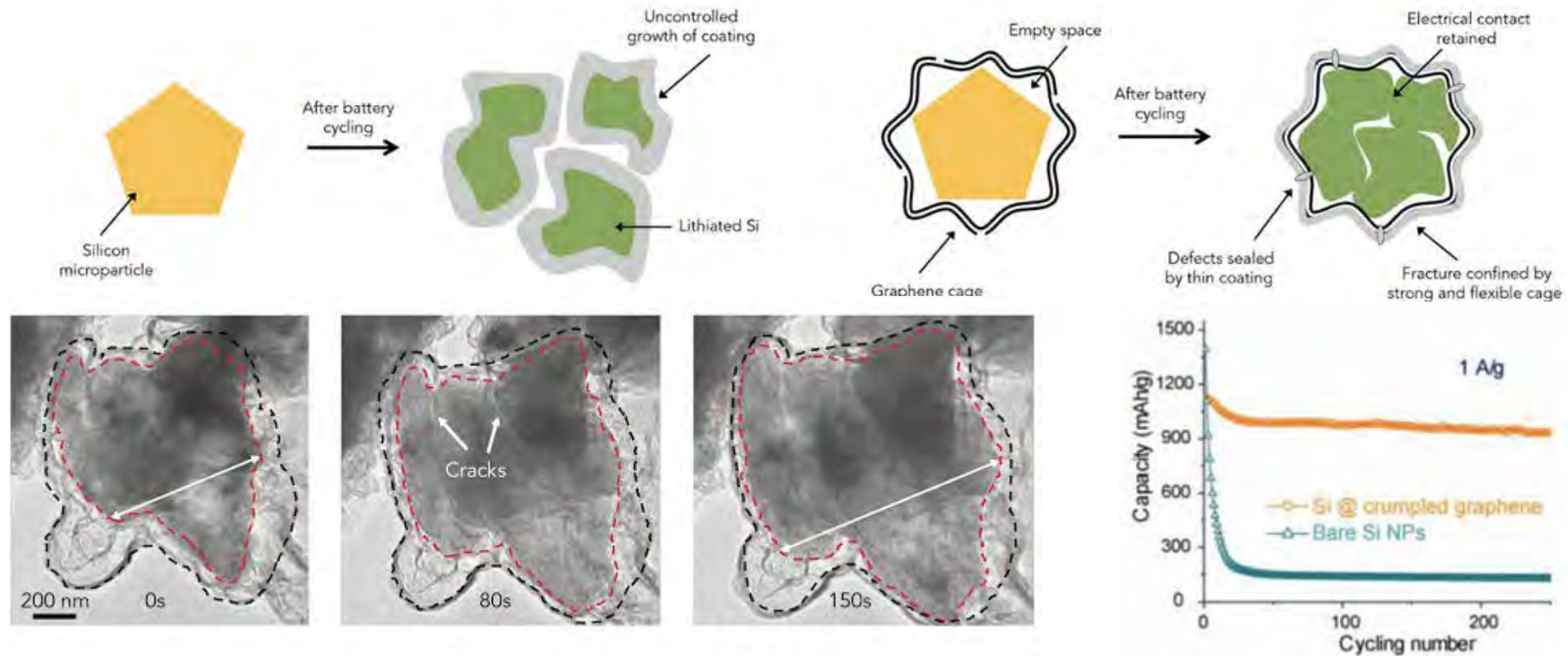


Si enabled Li-Ion Battery



System	mAh/g (AM _{Anode})	mAh/g (AM _{Total})	Capacity Increase
Silicon / NMC	2000	156	46%
Graphite / NMC	370	107	

Graphene Silicon Anodes



Time-lapse images from an electron microscope show a silicon microparticle expanding and cracking within its graphene cage as lithium ions rush in during battery charging. The cage is outlined in black, and the particle in red. (Y. Li et al., Nature Energy)

Graphene Technical Benefits



Mechanical Properties



Thermal Dissipation



EMI Shielding & ESD



Barrier Properties



Processability



Thermal Stability



Extend Lifetime



Light weighting

Graphene Technical Benefits



Oxidation Resistance



Electrical Conductivity



Moisture Barrier



Compressive Strength



Permanent Anti-Static



UV Resistance



Colorable



Cost Reduction

Graphene Technical Benefits



Abrasion Resistance



Recyclability



Corrosion Resistance



Lubricant



Weathering Resistance



Improved Cycle Time

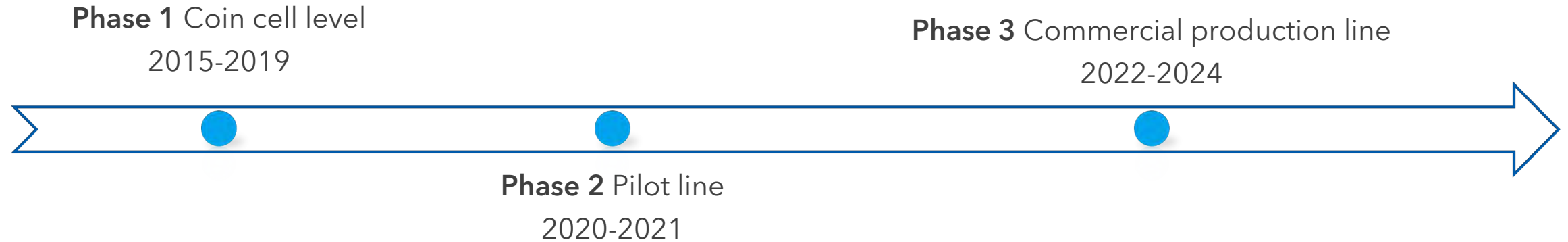


Sound dampening



Flame Retardant

Execution Strategy



Phase 1:

- Lab testing is completed regarding graphene additive for anodes and cathodes paste
- First patent has already been published
- Funding needs for pilot lines has already been obtained

Phase 2:

- Feasibility report started in 2020
- Set up of a pilot line to produce anode paste
- Customer validation
- Supply chain partnership
- Obtaining permits, certifications and standards

Phase 3:

- Depending on the result of feasibility study, set up an anode paste manufacturing plant
- Construction, commissioning and start of production

Financial And Capital Structure

Analyst Coverage



Rupert Merer



Amr Ezzat



MacMurray Whale



Ahmad Shaath



Marvin Wolff

RAYMOND JAMES®

Michael Glen

Capital Structure ⁽¹⁾

NanoXplore Symbol:	GRA NNXP
Listed Exchange:	TSX-V OTCQX
Basic Shares:	146 230 059
Stock Price:	\$4.19
Convertible Debentures:	-
Options:	3 583 466
Fully Diluted:	149 813 525
Market Cap:	\$0.6B

(1) As of Dec 31st, 2020

Performance Through Carbon Technology



Management Team



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