



# HYDROGRAPH

CSE: HG | OTCQB: HGCPF | FRA: M98

## IGNITING MATERIAL CHANGE

Investor Presentation: August 2023



# Forward-Looking Statement

This deck contains certain “forward looking statements” and certain “forward-looking information” as defined under applicable Canadian securities laws. Forward-looking statements and information can generally be identified by the use of forward-looking terminology such as “may”, “will”, “expect”, “intend”, “estimate”, “upon” “anticipate”, “believe”, “continue”, “plans” or similar terminology. Forward-looking statements and information include, but are not limited to: the use of the net proceeds from the previously announced private placement, anticipated benefits resulting from the Marketing Services Agreement, the future exercise of the Options, ability to successfully increase commercial scale production at its manufacturing facility, and the timing thereof, the potential valuation of Company, any EBITDA predictions, the commercialization of HydroGraph’s products that lead to customer contracts resulting in our potential valuation and EBITDA predictions, and the Company’s business plans and strategies.

Forward-looking statements and information are based on forecasts of future results, estimates of amounts not yet determinable and assumptions that, while believed by management to be reasonable, are inherently subject to significant business, economic and competitive uncertainties and contingencies. Forward-looking statements and information are subject to various known and unknown risks and uncertainties, many of which are beyond the ability of HydroGraph to control or predict, that may cause HydroGraph’s actual results, performance or achievements to be materially different from those expressed or implied thereby, and are developed based on assumptions about such risks, uncertainties and other factors set out herein, including but not limited to: HydroGraph’s ability to implement its business strategies; risks associated with general economic conditions; adverse industry events; stakeholder engagement; marketing and transportation costs; loss of markets; volatility of commodity prices; inability to access sufficient capital from internal and external sources, and/or inability to access sufficient capital on favorable terms; industry and government regulation; changes in legislation, income tax and regulatory matters; competition; currency and interest rate fluctuations; and other risks. HydroGraph does not undertake any obligation to update forward-looking information except as required by applicable law. Such forward-looking information represents management’s best judgment based on information currently available. No forward-looking statement can be guaranteed, and actual future results may vary materially. Accordingly, readers are advised not to place undue reliance on forward-looking statements.





HydroGraph, the most cost-effective producer  
of high purity graphene in the industry



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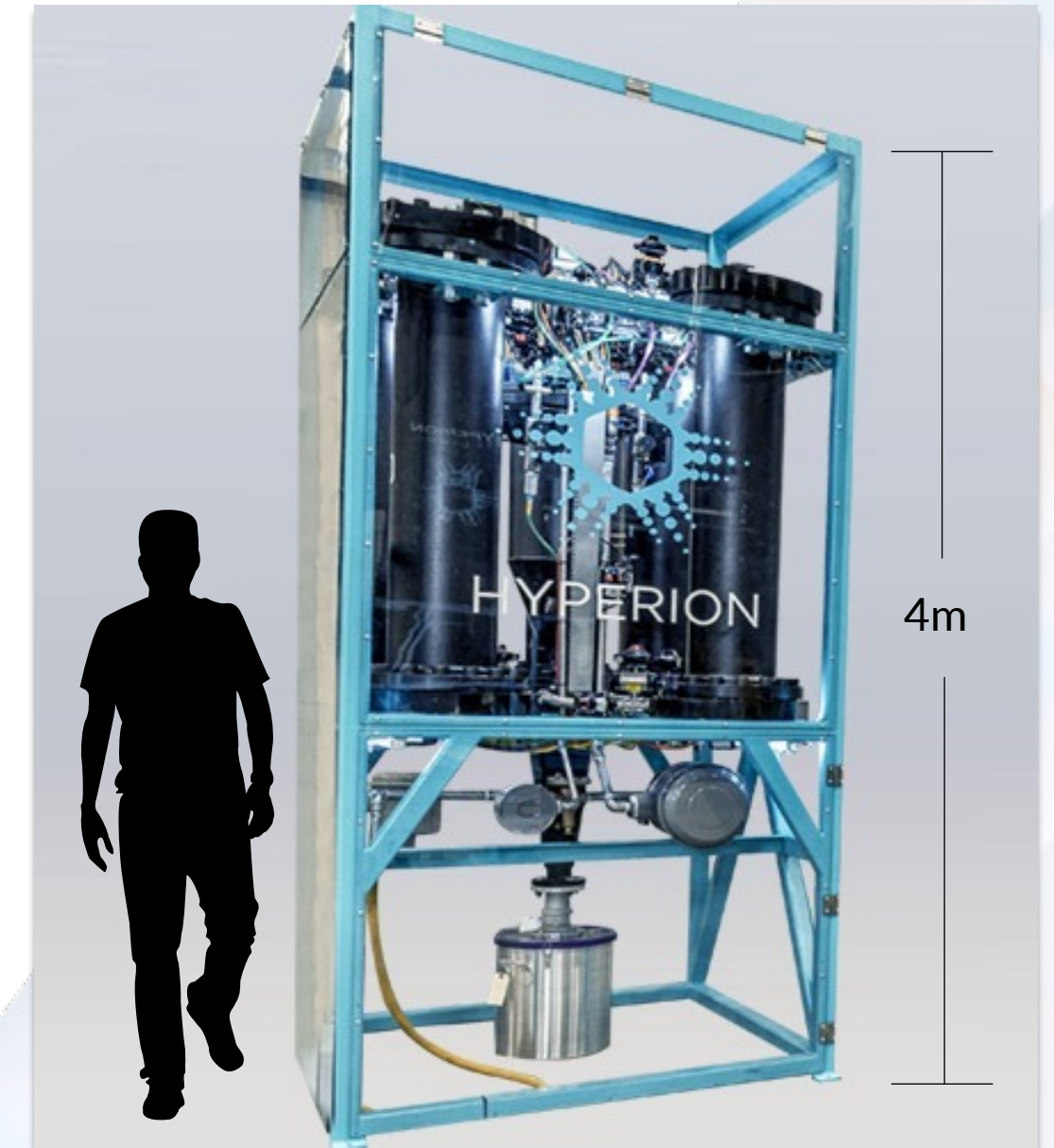
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# The HydroGraph Graphene Revolution

## WHAT WE DO

- HydroGraph is one of the world's purest producers of graphene, currently positioned to be a global leader in commercializing graphene at scale.
  - HydroGraph's patented technology uniquely positions the company for multiple high growth markets in the production of graphene, and other strategic materials.
- Our patented **Hyperion System**:
    - Produces the purest, blackest graphene with the lowest environmental footprint;
    - Solves industrial graphene supply problems of value, quality and scale, in nano-material production; and
    - Most cost-effective producer of high purity graphene in the industry



HydroGraph's Hyperion System



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# We Are A Global Leading Graphene Manufacturing Company

With a patented process that produces the highest quality graphene at the greatest cost efficiency, we are ready for commercialization

## MARKET POSITION

### Strong customer response to HydroGraph's Product and Value Proposition

- Patented Hyperion system produces 99.8% pure graphene with a high value to price ratio
- The Hyperion System is compact and modular allowing flexibility to build close to the customer minimize supply chain risk
- Can be nano-engineered for various applications, enabling integration of graphene into a multitude of materials
- Most environmentally friendly process in the world

## ECONOMICS

### A \$2.5B graphene market opportunity

- Uniquely positioned for multiple high growth, multi billion-dollar markets
- Positioned to be the global leader in producing pure graphene at scale
- Each Hyperion System can produce over 10MT/year and about \$2M in sales
- EBITDA margin over 40%
- Less than \$8M capex for the detonation units can generate ~ \$100M in sales, +\$40M in EBITDA

## MILESTONES

### Commercially available today

- Sample and test size quantities being produced in demonstration unit. Dozens of samples shipped to customers
- Commercial scale modular Hyperion System to be producing 10 tonnes/yr of pure fractal graphene commissioned
- Complete commercial scale, 10MT/yr reactive graphene production by Q3 2023
- Engaged with +40 customers on 20 different applications with 17 testing agreements/NDAs signed.



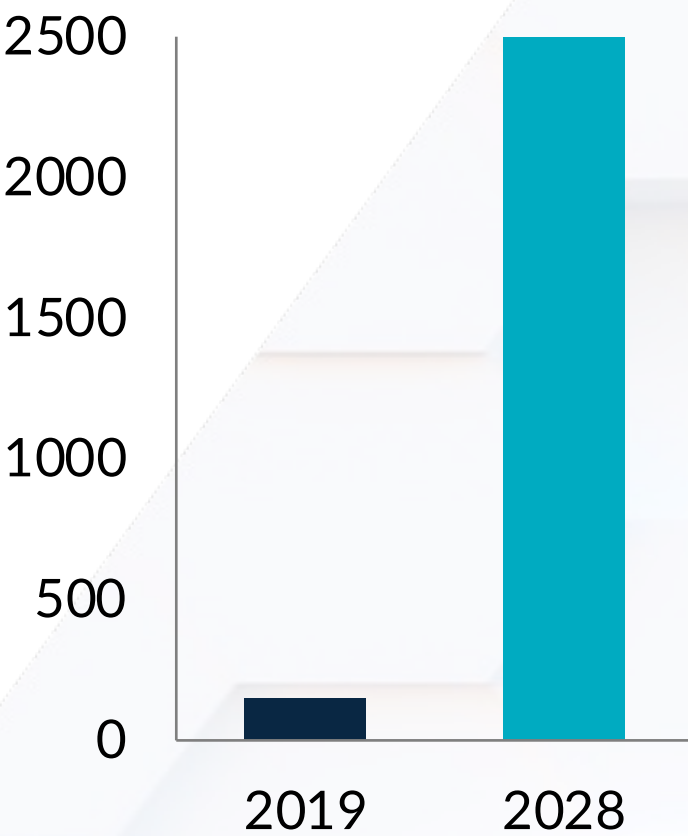
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# Graphene: The “Wonder” Material Of The Future Made Available Today

Graphene, a “supermaterial” poised to explode in the commercial market, is stronger than steel, harder than diamond, more conductive than copper, with better electron mobility than silicon.

| PROPERTIES              | FACTS   | APPLICATIONS   |
|-------------------------|---|--|
| STRENGTH                | 200x stronger than steel                          | Composite materials & alloys—rubber, plastic, aluminium & concrete |
| FLEXIBILITY             | Can bend & stretch to 120% of original size       | Coatings, additives & wearable technologies                        |
| THERMAL CONDUCTIVITY    | 10x conductivity of copper                        | Composite materials—concrete, coatings, polymers etc.              |
| IMPERMEABILITY          | Hydrogen atoms cannot penetrate its structure     | Filters, water purification, gas storage and hydrogen fuel cells   |
| ELECTRICAL CONDUCTIVITY | 1000x current capacity of copper                  | Longer battery life, semi-conductors                               |
| ELECTRONIC BEHAVIOUR    | Electrons can move at near light speed through it | Improved speed / efficiency for computer chips                     |
| OPTICAL PROPERTIES      | Highly transparent                                | Thinner, lighter screens and transparent tensile coatings          |



The global graphene market size valued at \$90M in 2019 and is projected to reach \$2.5B by 2028, growing at a **CAGR of 50%** from 2020 to 2028  
(Allied Market Research)

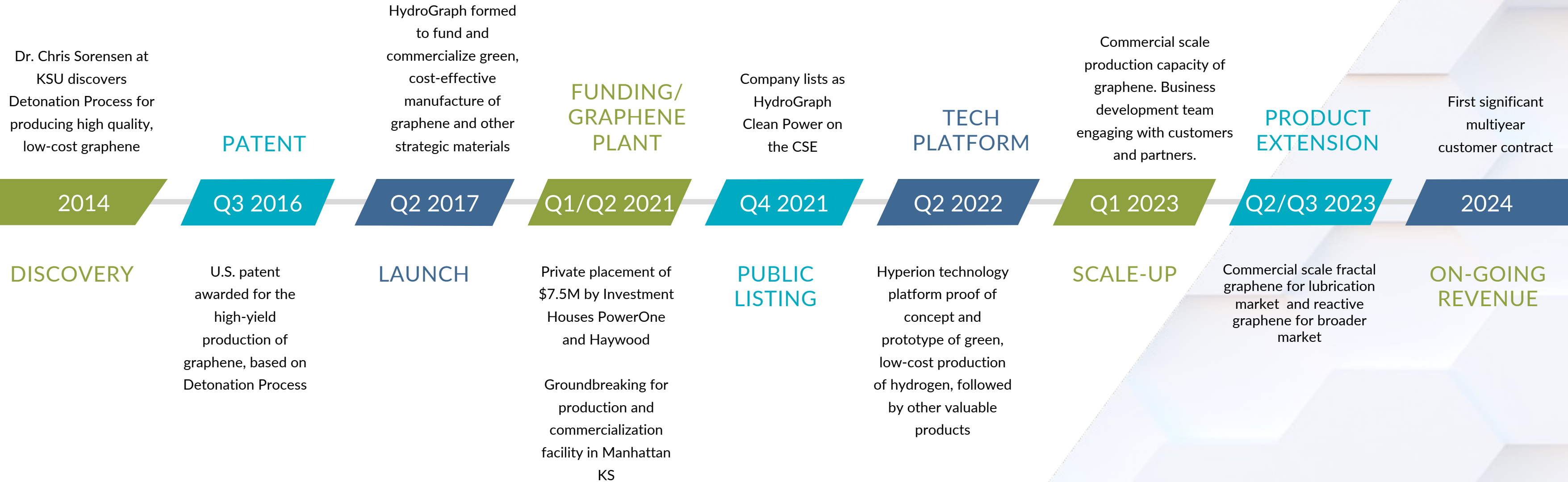


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# Roadmap To Commercial Production

Product testing completed, ready for commercialization





# Best-in-Class Executive Team



**Stuart Jara**  
Chief Executive Officer

More than 20 years' operating experience as an executive in industrial, specialty chemicals and alternative-energy sectors, plus 10 years leading PE portfolio companies. Held P&L responsibility for \$1.2B business and involved in over \$2B of capital investment and acquisitions across 12 countries.



**Kjirstin Breure**  
President

A 15-year background in emerging technologies and portfolio management, with experience in investor relations; on HydroGraph board since lab scale; Director of Operations for Frontline Crossings, and Chief Operating Officer with Omada Technologies.

- Multiple start up experiences
- +100 years of combined industry experience
- Proven track-record of success in scaling technology
- CN +\$1.6 m personnel funds committed to date



**Bob Wowk**  
CFO

More than 30 years of experience as a finance and biz dev executive with previous roles held at Linde and Air Products; 10 years in CFO roles with small and mid-size companies; M.B.A. in finance from Wharton and a civil engineering degree from Lafayette College.



**Ranjith Divigalpitiya**  
Chief Science Officer

More than 25 years as a physicist; invented 3M's graphene-like carbon coatings and contributed to 190 invention submissions and 20 granted US patents. Authored more than 33 peer-reviewed papers and teaches at Western University, Canada.



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# Experienced Technical, Business Development and Finance Team



**Stephen Corkill**  
VP Operations

As former VP of Engineering, Stephen developed Hydrograph’s current production equipment and is building a working prototype for our hydrogen production as well. In his role as VP of Operations, he has evolved into commercial design and developing trade secrets for the business.



**Chris Sorensen**  
VP R&D

As the former Cortelyou-Rust University Distinguished Professor in the department of physics at Kansas State University, Chris invented the the company’s Hyperion technology. He has seven patents and nearly 300 publications and is a fellow of the American Physical Society.



**Carl Kernizan**  
VP Business Development -  
Lubricants

Accomplished senior leader in the lubricants industry with 30+ years of pioneering product development, technical sales and business growth across the Americas and Europe. A renowned expert in grease manufacturing and holds a PhD in physical chemistry. A proven innovator aligning strategy, R&D and operations. Holder of multiple patents and recipient of NLGI’s prestigious Golden Grease Gun Award.



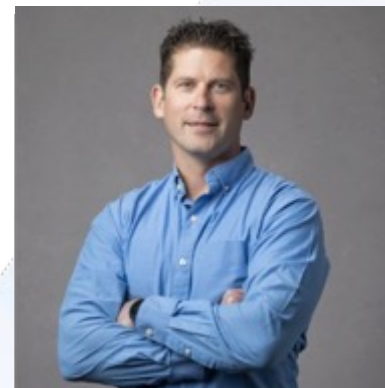
**Mathew Lee**  
Chief Accounting Officer

Mathew provides accounting, management, securities regulatory compliance and corporate secretarial services for HydroGraph. He is CPA Charterholder and earned a B.Comm from the University of British Columbia.



**Stefan Bossman**  
Lead Chemist

Stefan a Distinguished Professor emeritus at K State. He received his B.S. and PhD in chemistry from the University of Saarland, Germany. Previous posts include postdoctoral research associate at Columbia University, an assistant professor and subsequently an associate professor-ship in chemical and process engineering at the University of Karlsruhe, Germany. Stefan holds a PhD, has authored more than 200 publications and holds 14 patents.



**Randall Zajac**  
Dir. of Business Dev. –  
Composites & Resins

Randall has an extensive background in composites including R&D, process engineering and biz dev roles. Notable accomplishments include process development at TPI in Newton, IA and working with the Advanced Composite Research Center at Lamborghini in education on designing parts, tooling, materials, and processes for SMC composite components.



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# The HydroGraph Graphene Revolution

HydroGraph's patented technology uniquely positions the company for multiple high growth markets in the production of graphene, and other strategic materials



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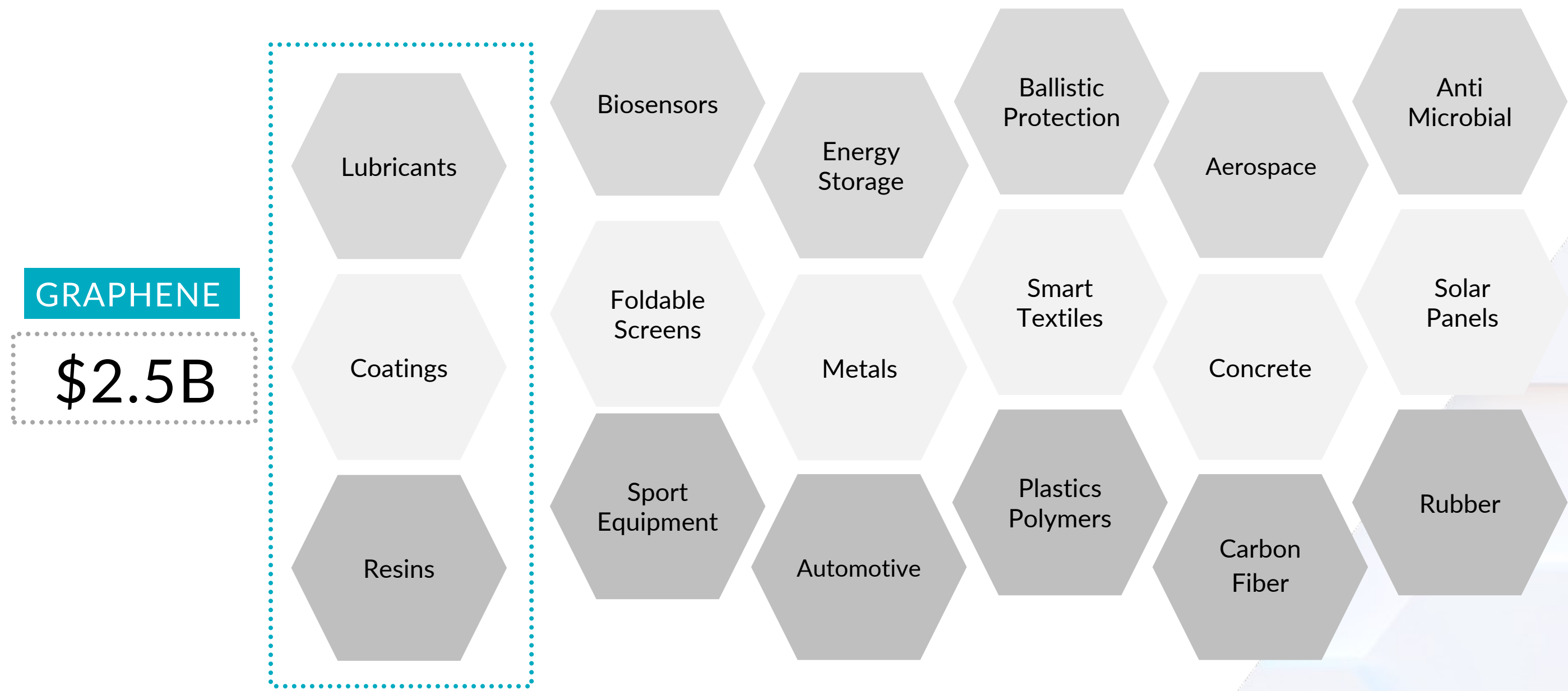


# Future Opportunities

“Lubricants, coatings and resins are three large, early addressable markets.”

Stronger than steel, thinner than paper, graphene will be the future of tech

## Markets and Applications



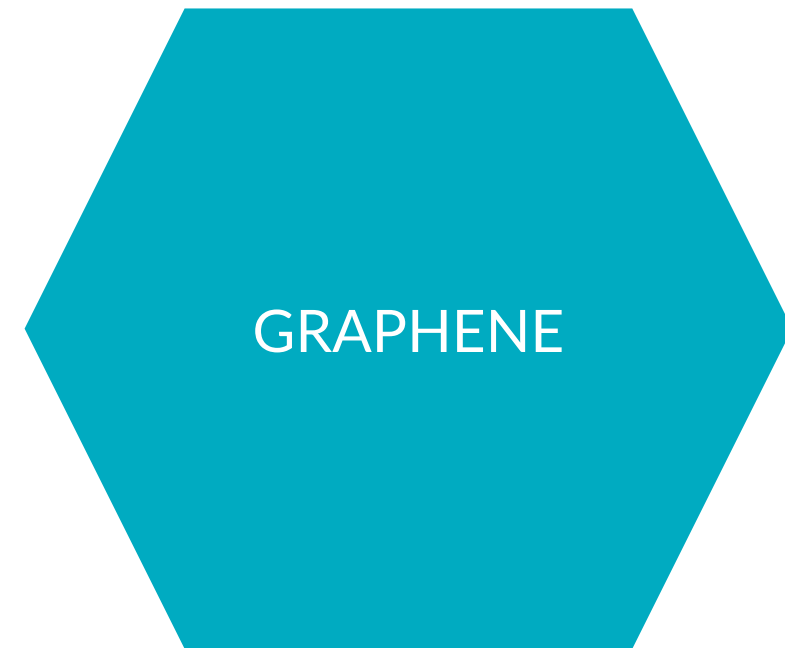
HydroGraph’s Hyperion process produces the purest (99.8%) graphene, and the company’s “reactive graphene” product has a reactive shell that allows it to chemically combine with other materials

This flexibility makes it the best graphene solution for countless applications.

Lubricants, coatings and resins are three large, early addressable markets.

# The Market Opportunity

GRAPHENE DEMAND IS READY  
FOR COMMERCIAL SCALE



**\$2.5B**

Estimated Total Market  
Size By 2028

HydroGraph  
Priority Markets

Lubricants

Resins/  
Composites

Coatings

**\$1.0B**

Estimated HydroGraph  
Priority Market Size By  
2028



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# Customer Acquisition Strategy

\$1B +  
Target  
Market

## Focus on lubricant, composites, resins and coatings

- Testing ongoing
- End user highly values enhanced material properties
  - High price elasticity
- Leverage internal resources from R&D, to application development to business development
  - Drive customer adaptation of HydroGraph's graphene
- Work closely with customers to optimize graphene integration in customers' material

## Pursue secondary markets with partners that have existing market competencies:

- R&D
- Application development
- Channel to market

## Partnership with Ceylon Graphene Technologies – March 2023

- Ceylon has unique capabilities for the lead acid battery market
- HydroGraph's graphene improves the charge acceptance of lead acid batteries by 47%
- HydroGraph and Ceylon agree to work exclusively together to commercialize product for this \$45 billion market

## Customer Acquisition Process

- Samples to prove our quality ~ 1 to 3 months
- NDA to share more information on application and testing: ~ 2 to 9 months
- Cooperation agreement to run longevity testing and start planning supply ~6 to 18 months
- Long term supply agreement

## Current Status

- Material customer engagements, +40
- Expanding NDAs/Testing agreements, +15
- Over 20 different applications being discussed



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# Global Quality Problem: Not All Graphene Is The Same

While many companies are developing graphene production methods, the truth is that not all graphene is the same quality

## OTHER PRODUCERS

300 companies worldwide claim to produce graphene

An analysis of 60 companies by Advanced Materials magazine found:



There is **almost no high-quality graphene** in the market as defined by ISO



No company produces over **50% graphene** content, with a majority producing less than 10%



Most companies are producing **fine graphite**, not graphene

Compared to HydroGraph



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HydroGraph makes identical batches of **pristine graphene** at industrial scale



HydroGraph produces **99.8% pure carbon content graphene**



HydroGraph's graphene has been **tested as pure** by 5 labs and verified by the Graphene Council



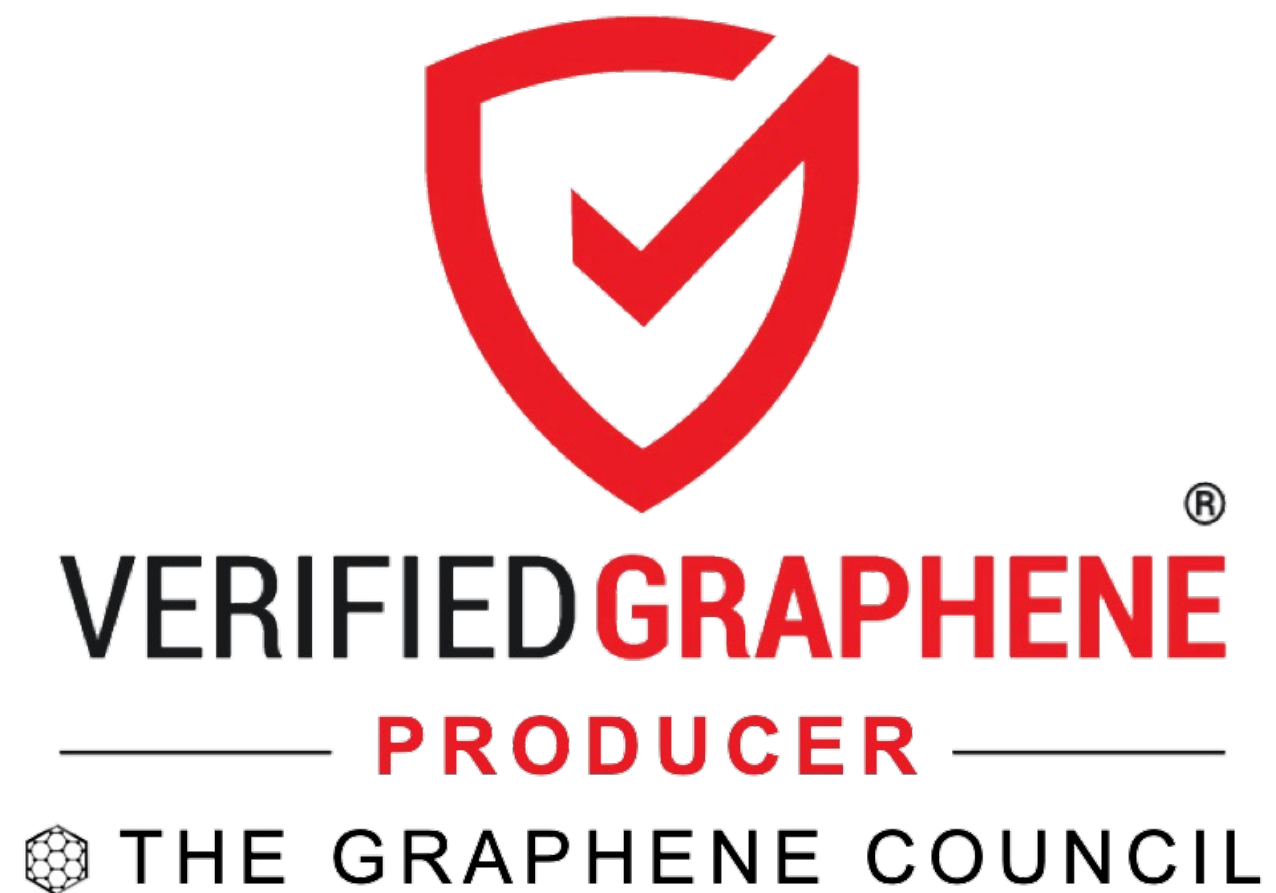
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<https://www.thegraphenecouncil.org/page/Registry>



# First In Americas for Certification



## The Highest Standards

The Graphene Council's Verified Graphene Producer® certification is the only credential with independent 3rd party in-person inspections of graphene production facilities, verification of production methods and volumes, and quality control processes based on the Graphene Classification Framework (GCF). HydroGraph is currently the third company to be certified globally and the only company in the Americas to be certified.



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# The HydroGraph Graphene Solution

## Solving graphene's industrial problems

### Market Challenges

**Large Quality Irregularities**  
Current processes produce graphene  
That is primarily graphite, not pure graphene

**Energy Inefficient**  
Many methods require a high level of  
energy to produce graphene

**High Cost of Production**  
Prohibitively expensive to produce with  
mined graphite for scale

**Not environmentally friendly**  
Many conventional methods use graphite  
mining, which is not environmentally

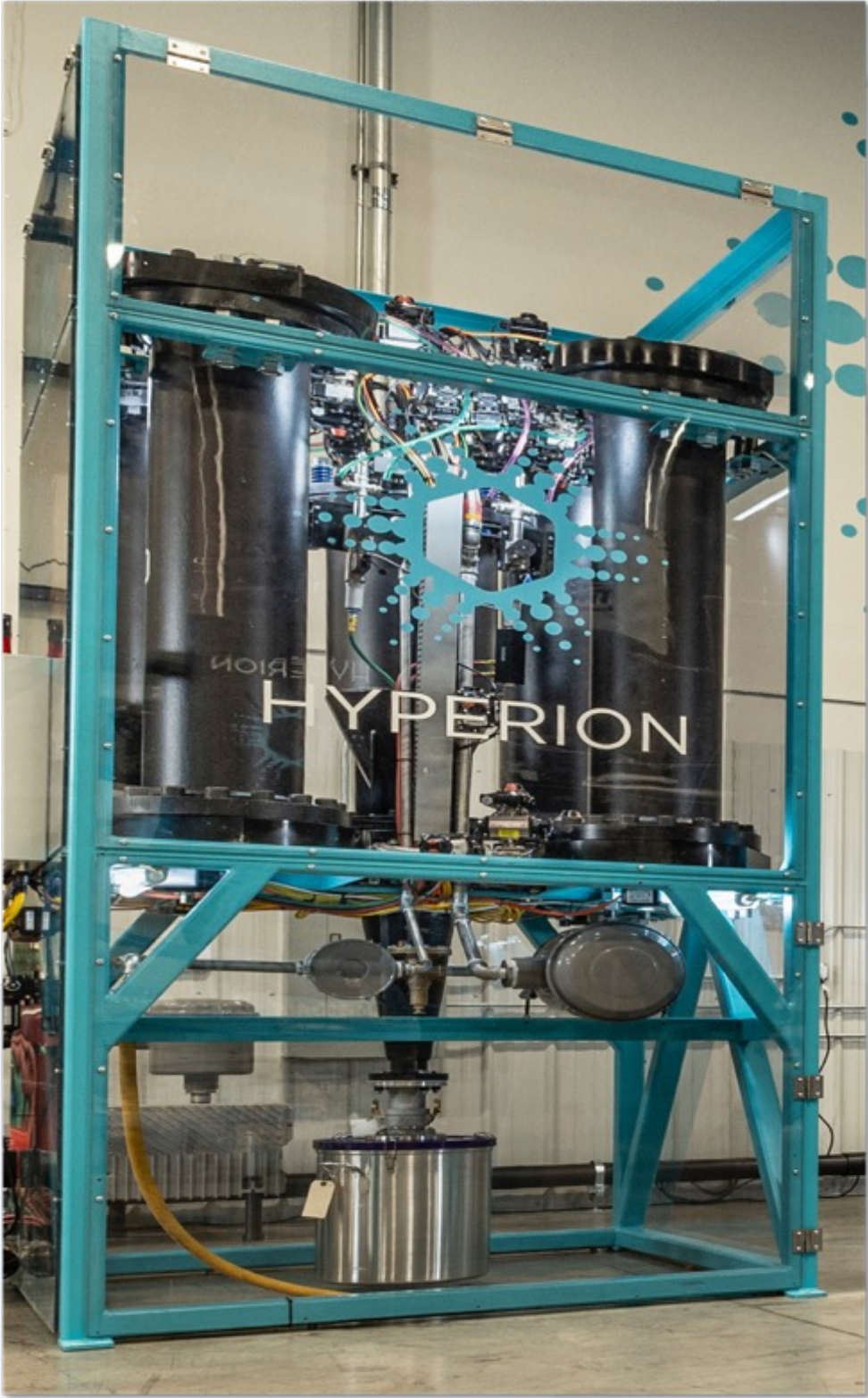
### HydroGraph Solutions

**High Quality**  
The purest (99.8%) graphene at Commercial Scale

**Energy Efficient**  
High-yield, graphene produced with minimal energy, no  
solvents, no emissions.

**Cost Effective**  
Our proprietary technology uses readily available gases to  
produce high quality graphene with lowest Capex  
requirement in the industry.

**Environmentally Friendly**  
The Hyperion System uses very little energy, no solvents, and  
produces no green house gas emissions



HydroGraph's Hyperion System














































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# Significant Competitor Advantage In High Purity Segment

|                      | Low Energy Consumption  | +99% Purity   | High Consistency  | Low Cost   | Easily Scalable & Modularity  | Chemically Tailorable  | Nano Size Particles  | < 10 layers  | Key Competitors                |
|----------------------|---|---|---|--|---|--|--|--|--------------------------------|
| Hydrograph           |                |    |    |           |    |               |   |           |                                |
| Chemical Exfoliation |                |    |    |           |    |               |   |           | NanoExplore<br>Versarien       |
| Microwave Plasma     |                |    |    |           |    |               |   |           | Levidan<br>GMG                 |
| Sonication           |               |   |   |          |   |              |  |          | Currently<br>Lab Scale<br>Only |
| CVD*                 |              |  |  |         |  |             | NA   |         | Electronics<br>Segment Only    |
| Legend               |  = Exemplary |   |   |  = Good |   |  = Adequate |  |  = Poor |                                |

\*CVD used exclusively for small volume semi-conductors and high end electronics which Hydrograph is not currently targeting.

# The HydroGraph's Hyperion System

Solves industrial graphene supply problems of value, quality and scale, in nano-material production



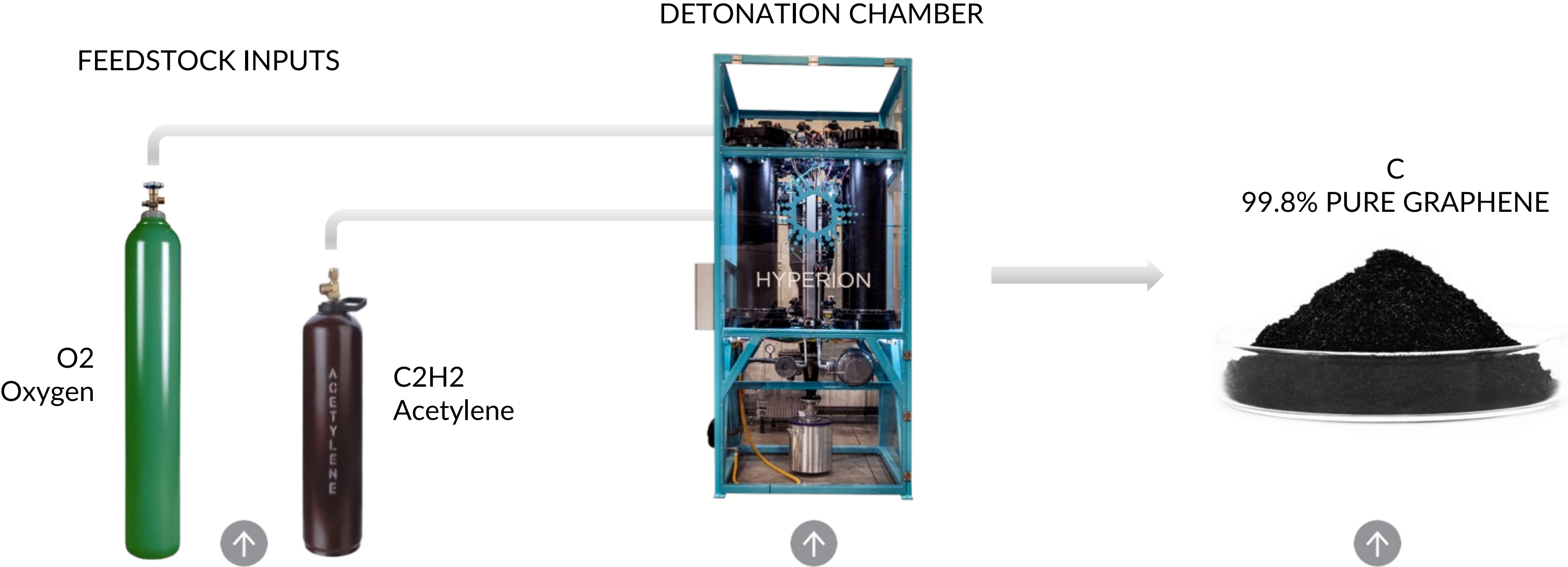
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# HydroGraph's Hyperion System -- Unique, Patented and Reliable



## Readily Available Feedstock

### EXTENSIVE APPLICATIONS

HydroGraph's Hyperion System will change the landscape of nanotechnology, beginning with graphene and followed by an array of other valuable materials.

## Detonation Chamber

### PATENTED HYPERION PROCESS

Conserves energy and prevents emissions. Ideal for commercial deployment: **modular, scalable, customizable, decentralized, and eco-friendly.**

## Graphene

### HIGHEST QUALITY MATERIALS

We produce the **highest-quality, purest, blackest, most easily integrated** graphene on the market. The same high-quality standards will apply to all other materials produced by HydroGraph.



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Hyperion detonation is exothermic, not endothermic, meaning it neither pulls energy from the grid nor burns fossil fuels to convert hydrocarbon to graphene.

# FRACTAL GRAPHENE

Patent for the high-yield production of graphene via detonation

## Market Problem

Graphene has been recognized as the first Super Material of the 21st century. However, commercialization of graphene was not feasible before now.

Conventional methods for producing graphene were:

- Producing inferior and inconsistent graphene, sometimes graphite
- Very expensive
- Not scalable
- Inconvenient
- Involved toxic chemicals
- Uses vast amounts of electricity
- Addressable markets include
  - Lubricants
  - Energy storage
  - Resins
  - Specialty chemicals
  - Coatings

## HydroGraph Patented Solution

Until now. HydroGraph's proprietary detonation technology – Hyperion System– produces turbostratic graphene that is:

- 99.8% pure
- 2-to-7 layers thick
- Identical from batch to batch
- High value
- Uses very little energy
- Green – using acetylene & oxygen as feedstock with net zero emissions
- Scalable
- Modular design that can be deployed virtually anywhere

“The Hyperion method to create graphene is an example of an elegant synthesis. Fill a chamber with acetylene and oxygen, ignite the mixture with a small spark, and voila, high purity graphene is formed.”

– Dr. Chris Sorensen,  
the creator of the  
Hyperion process



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# REACTIVE GRAPHENE

Graphene/Graphene Oxide Core/Shell Particulates and Methods of Making and Using the Same

## Market Problem

Certain high valued applications requires additional functionalization to:

- Enhance bonding and integrating graphene with other materials
- Bring attractive properties, such as tensile strength, elasticity, and conductivity to more complex materials
- Address applications in a vast number of areas, including:
  - Medicine and biology
  - Resins and composites
  - Dispersions
  - Functional coatings
  - Plastics

## HydroGraph Patented Solution

HydroGraph has responded by producing Reactive Graphene, which can bond more easily to other materials thanks to its reactive shell, which is functionalized with carboxylic acid groups.

- HydroGraph leaves the graphene inner core intact, a huge advantage compared to standard graphene oxide which is only 70% carbon content vs HydroGraph's 96%.
- HydroGraph's reactive graphene is a 'pristine functionalized graphene'
- Due to the success of the material, HydroGraph has extended the product line to include a host of other functionalizations.

"We can tailor this graphene to virtually any application; just name it. We can perform the entire palette of organic chemistry reactions on the graphene's surface and keep it intact. The future is extremely bright with regard to us integrating graphene into just about any material you can imagine"

– Dr. Stefan Bossman,  
HydroGraph's lead chemist



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# Patented Technology

## Fractal Graphene Patented No: 9,440, 857 B2

The 2016 patent for the high-yield production of fractal graphene via detonation is the founding technology for HydroGraph. The detonation closed system produces the highest quality products, while conserving energy, preventing emissions, and is modular and scalable for clients. Additionally, the HydroGraph portfolio now contains patents relating to the production of nanomaterials, applications involving nanomaterials and clean energy.



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### REACTIVE GRAPHENE

Disc. No.: 2019-064; Attorney Docket No.: 52468

Title: "Graphene/Graphene Oxide Core/Shell Particulates and Methods of Making and Using the Same"

PCT Application No.: PCT/US2020/038055

Filing Date: June 17, 2020

### GRAPHENE INK

RE: Disc. No. 2019-066

Title: "Nano-inks of Carbon Nanomaterials for Printing and Coating"

PCT Patent Application No.: PCT/US2020/039547

Filing Date: June 25, 2020

### GRAPHENE ENHANCED CARBON FIBER

Disc. No.: 2017-008; Docket No.: 49240-US

Title: "Additive Manufacturing of Continuous Fiber Thermoplastic Composites"

U.S. Application No.: 16/487,622 (PCT/US2018/018800)

### HYDROGEN PRODUCTION

Disc. No.: 2021-027; Attorney Docket No.: 54713-PCT

Title: "Process for Synthesis of Syngas Component"

U.S. Provisional Patent Application No.: 63/161,625

Filing Date: March 16, 2021



# Why Invest

## 1 | TECHNOLOGY ADVANTAGE

Our Hyperion detonation technology is a patented, simple, scalable platform for the production of graphene products.

## 2 | PRODUCT ADVANTAGE

Highest purity graphene (99.8%), nano-engineered for the client, cost effective and scalable. Enables integration of graphene into existing products.

## 3 | COMMERCIAL ADVANTAGE

Our Hyperion system is compact and modular; the small footprint allows for deployment virtually anywhere.

## 4 | ENVIRONMENTAL ADVANTAGE

High-yield, industrial graphene produced with minimal energy, no solvents, with virtually no emissions. Unique in the industry.

## 5 | GLOBAL MARKET ADVANTAGE

Applications include lubricants, resins, composites, polymers, coatings, batteries, concrete, aerospace, automotive, biomedical and many more.

## 6 | CUSTOMER ADVANTAGE

Market reaction is positive regarding the purity, consistency, quality control and customizability of our graphene.

## Upcoming Catalysts

- Commercial scale modular Hyperion System to be producing 10 tonnes/yr of fractal graphene commissioned
- Completing upgraded commercial scale reactive graphene production Q3 2023
- Close first major multiyear contract in 2024 and reaching \$25M worth of annual customer contracts in 2025

## Capital Structure (as at 05/24/2023)

|                          |             |
|--------------------------|-------------|
| Basic shares outstanding | 174,775,224 |
| Options outstanding      | 16,840,000  |
| Warrants outstanding     | 61,620,302  |
| Fully diluted            | 253,235,526 |
| Market cap. (5/24, 2023) | CA\$18.4m   |



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# THANK YOU

We appreciate your interest in HydroGraph and thank you for taking the time to review our presentation.

If you have questions, please feel free to reach out to us. You can access the contact page on our website at [hydrograph.com](https://hydrograph.com), or through the QR code to the right. Contact information for our top executives is also provided through QR codes for your convenience.

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