



# zentek

## Company Overview

NASDAQ: **ZTEK**  
TSX-V: **ZEN.V**

Q2 2024



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# A Healthier & Safer World Through Nanotechnology.

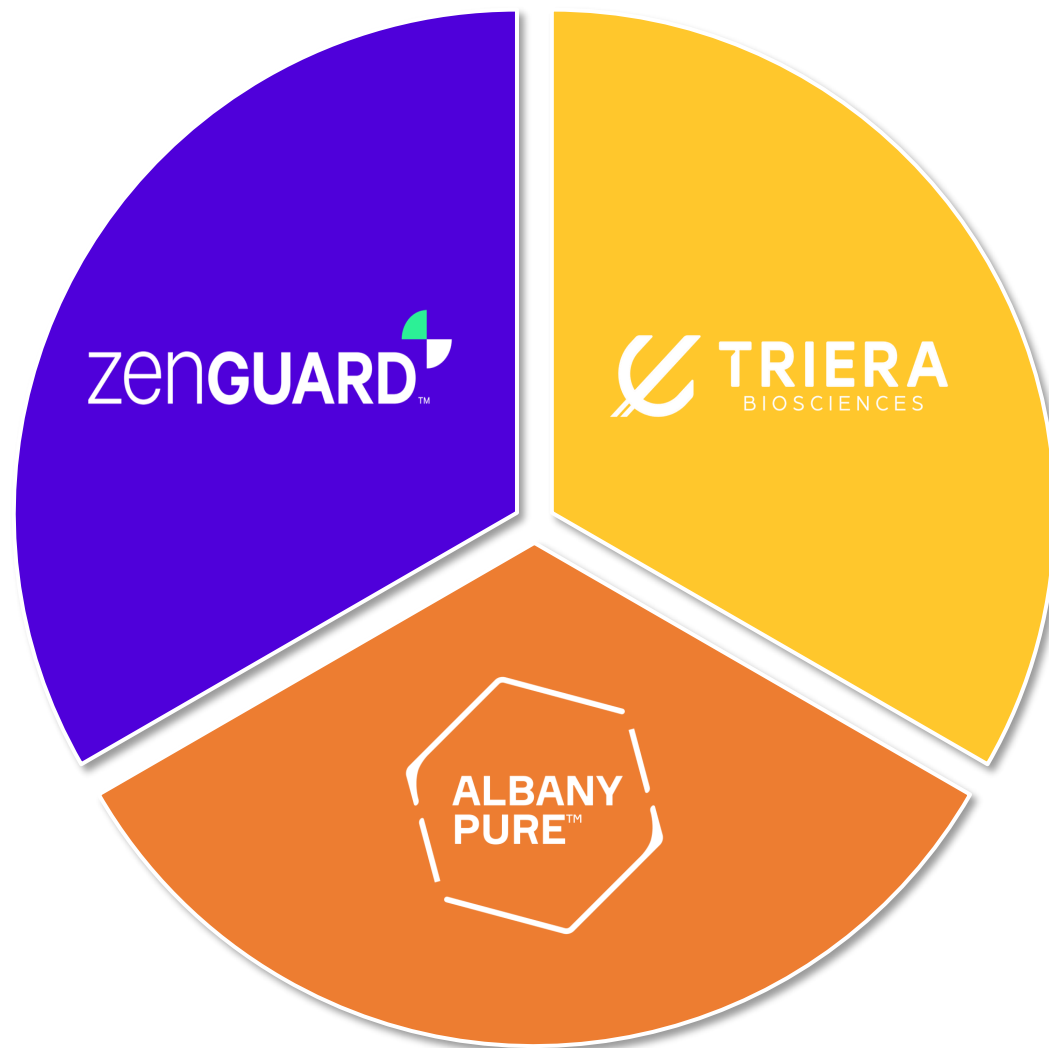
Nanotechnology, including graphene, has the potential to protect against pathogens, detect and treat disease, clean our water, make building materials stronger, make products safer and produce cleaner energy. With almost limitless potential to improve people's lives, we are uniquely positioned to create significant value through our next-generation solutions.



We develop innovative nanotechnologies with our partners to improve people's lives.



# zentek One Company; Many Compelling Opportunities



## The Growing Indoor Air Quality Market

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The indoor air quality (IAQ) market is experiencing robust growth, driven by the increasing post pandemic demand for energy-efficient solutions.

## Bioscience & Pharmaceuticals

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The bioscience and pharmaceutical market is continuously growing driven by innovations in drug development and a focus on personalized medicine.

## EV Revolution & Mineral Asset

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The electric vehicle revolution is accelerating, fueled by advancements in battery technology, supportive government policies, and a growing consumer shift towards sustainable transportation options.

Graphene and nanotechnology can make existing products - working in existing systems - better. Greener and healthier solutions working with what we already have in place will be a sustainability game changer.

We believe Zentek is at the forefront of this materials science revolution.



Financial  
Snapshot

	ZTEK	ZEN
Exchange	NASDAQ	TSXV
PPS	\$1.09	C\$1.51
52 Wk. Range	\$0.98- \$1.75	C\$1.30- C\$2.30
Market Cap	~\$109.9M	~C\$152.2M
Average Daily Volume	~19.9K	~38.0K
Shares Outstanding	100.82M	

As of May 6<sup>th</sup>, 2024

# zentek Business Model

## Intellectual Property

Secure exclusive rights to our innovative ideas, designs, and unique products



## Partnerships

Work with manufacturing, distribution, industry professionals and government partners

## Research & Development

Harness nanotechnology to enhance existing products to solve large-scale problems



## Go To Market

Bring valuable new solutions to existing markets



# Graphene Opportunities

	Research & Deployment	Technology Demonstration	Production / Development
ZenGUARD™ Surgical Masks			9
ZenGUARD™ Enhanced Air Filters			9
Zentek's Passive Ice Protection System (RPAS)		5	
Zentek's Passive Ice Protection System (Wind Turbine)	2		
ZenARMOR™ Corrosion Protection Self-Healing Coating		4	
Intumescent Coating		3	
Fuel Additives		3	
Nano-biocomposites for advanced applications	2		
Anode Battery Technology	2		

## Product Technology Readiness Levels



[Government of Canada Technology Readiness Levels](#)



## Enhanced HVAC and PPE Filtration

Q2 2024

This product is currently being assessed for registration under the Pest Control Products Act. It cannot be manufactured, imported, distributed, or used in Canada at this time, unless explicit authorization has been obtained from Health Canada to use this product for the purpose of conducting research under the Pest Control Products Regulations

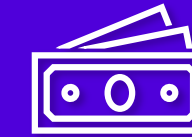
ZenGUARD™ is a Graphene and Silver based molecule that aims to enhance the viral filtration efficiency of HVAC filters and PPE (Masks).



# Why zen**GUARD**<sup>TM</sup> Enhanced Air Filters Could Be the Future of Air Filtration.



Our Goal:



Lower Building Costs



Lower Building CO<sub>2</sub>  
Emissions

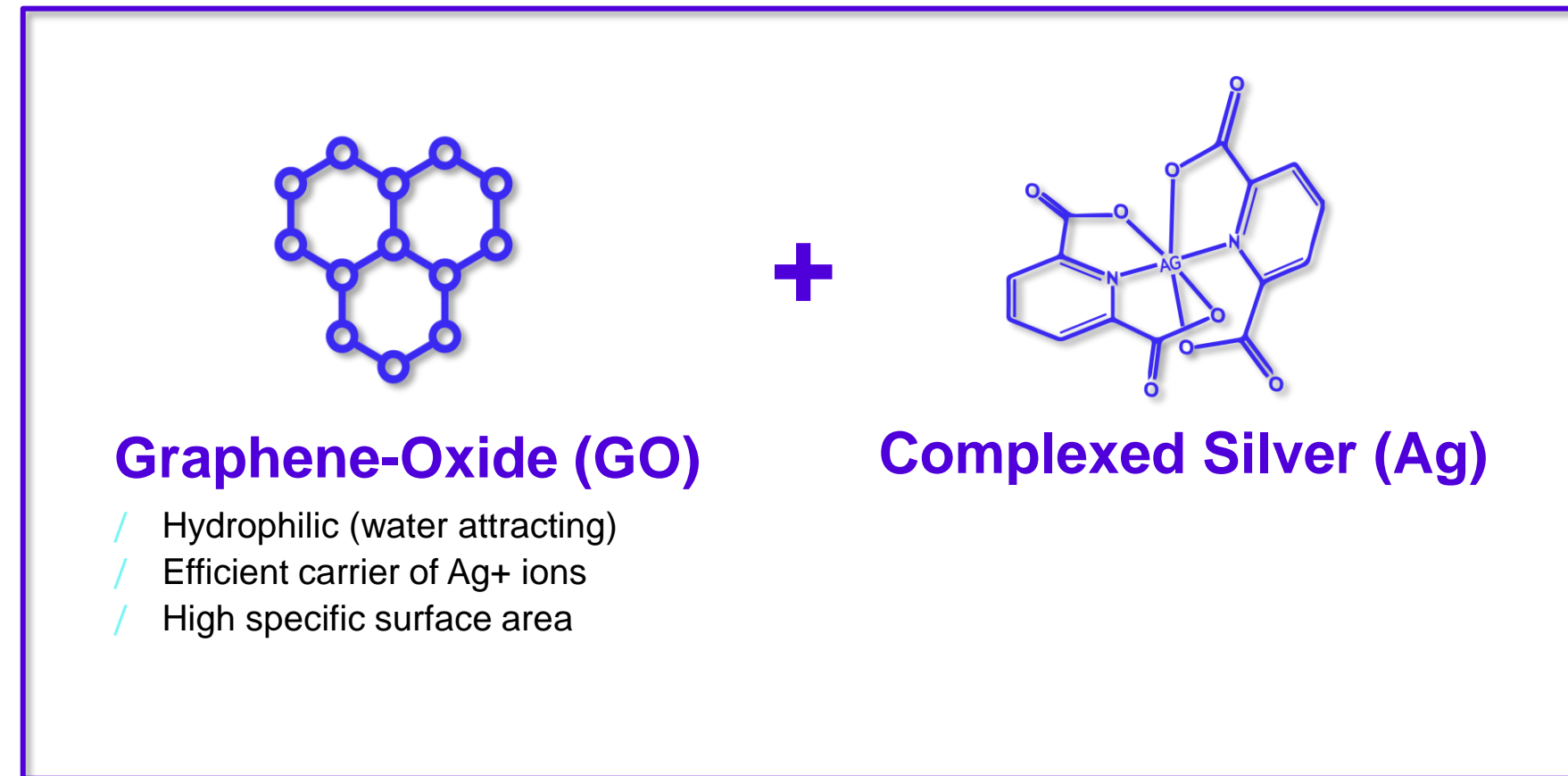
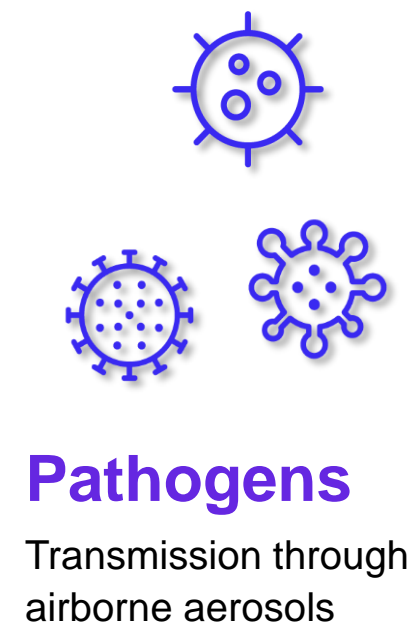


Keep Patrons Safer from  
Viruses and Bacteria



Reduce Building Waste

# zenGUARD™ How it Works



**Enhanced  
Protection**  
Against viruses

**Highly Synergistic Compound Aimed at  
Increasing Viral Filtration Efficiency**

# zenGUARD™ Complex Problem, Searching for a Solution

## Current Market Deficiencies

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IAQ improvement strategies come with a financial and environmental cost. This is typically driven by capital investment or increased energy usage and carbon emissions from HVAC systems.

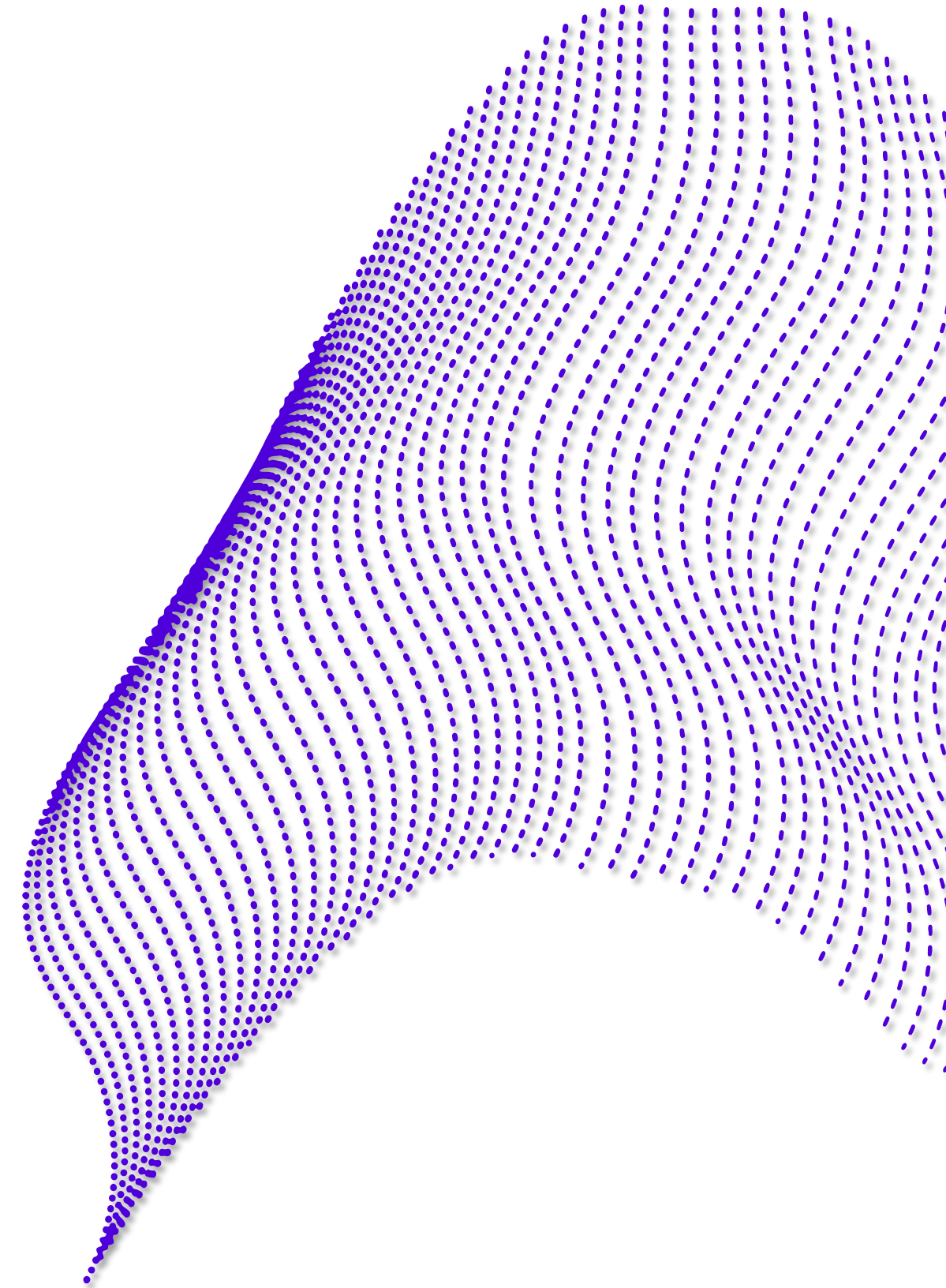
## A Greener Approach

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With buildings consuming ~40% of global energy, they are a major contributor to climate change. [1](#) IAQ and healthy buildings are crucially important and so is building decarbonization. The HVAC market needs a more sustainable solution to support improved IAQ efforts.


## Zentek's Goal

ZenGUARD™ Enhanced Air Filters aim to give facility managers an innovative, carbon-conscious option for healthier buildings using existing HVAC systems.



## 7.8% Global IAQ Market Growth<sup>2</sup>

The driving factor for the market is growing awareness about the importance of indoor air quality and people's health, increasing demand for carbon-conscious solutions, and government regulations to achieve both of these goals. Advancements in HVAC filters that improve IAQ within existing systems and without increased emissions are expected to offer significant growth opportunities to manufacturers.<sup>2</sup>

Two blue circles of different sizes are positioned side-by-side. The left circle is smaller and contains text about the 2021 market value. The right circle is larger and contains text about the 2027 market value.

**2021 IAQ Market  
Estimated Value**  
~ USD 12.6 B<sup>2</sup>

**2027 IAQ Market  
Estimated Value**  
~ USD 19.7 B<sup>2</sup>

Proportions do not represent actual size increase.



# Post-Pandemic IAQ Landscape

## Guidance

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Post-pandemic guidance recommends the use of MERV 13+ filters to better capture virus particles to meet building IAQ needs.<sup>[3](#)</sup>

## Shortcomings

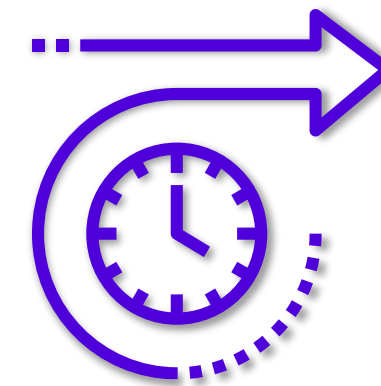
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MERV 13 filters increase energy usage, may not be usable in all HVAC units and typically have shorter lifespans than lower MERV-rated filters, increasing maintenance costs and waste.

## The Future

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The goal of ZenGUARD™ Enhanced Air Filters is to offer the viral protection of a MERV 13, while reducing costs, emissions and waste.



## Example based on the City of Toronto

Results are based on the City of Toronto currently using MERV 13 filters to meet IAQ needs and switching to a MERV 9A filter.

### Overview

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The case study was based on total building square footage as a guide for associated air circulation/filtration, energy usage and filter usage. Zentek proprietary and copyrighted models were used in the study.

### Cost Savings

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**Savings of up to \$40 million per year** from fewer filter change outs, reduced waste and lower energy costs while maintaining IAQ.<sup>4</sup>

### Environmental Impact

**Emission savings of ~3,029 Tonnes of CO<sub>2</sub>** per year. To offset that amount of CO<sub>2</sub>, 49,976 trees would have to be planted and grow for 10 years.<sup>4</sup>

# zenGUARD™ Testing and Validation



## Program / Article

- ZenGUARD™ answered Innovative Solutions Canada's call to identify indoor air quality solutions that achieve a net reduction in airborne viral load without requiring modifications to existing HVAC systems without reducing air flow rates.



## Testing

- Testing Partner who purpose-built a Bioaerosol Facility for testing ZenGUARD™ Enhanced Air Filters. The goal was to significantly reduce pathogens, without affecting airflow, energy use, air quality, or requiring changes to current HVAC systems or extra costs.



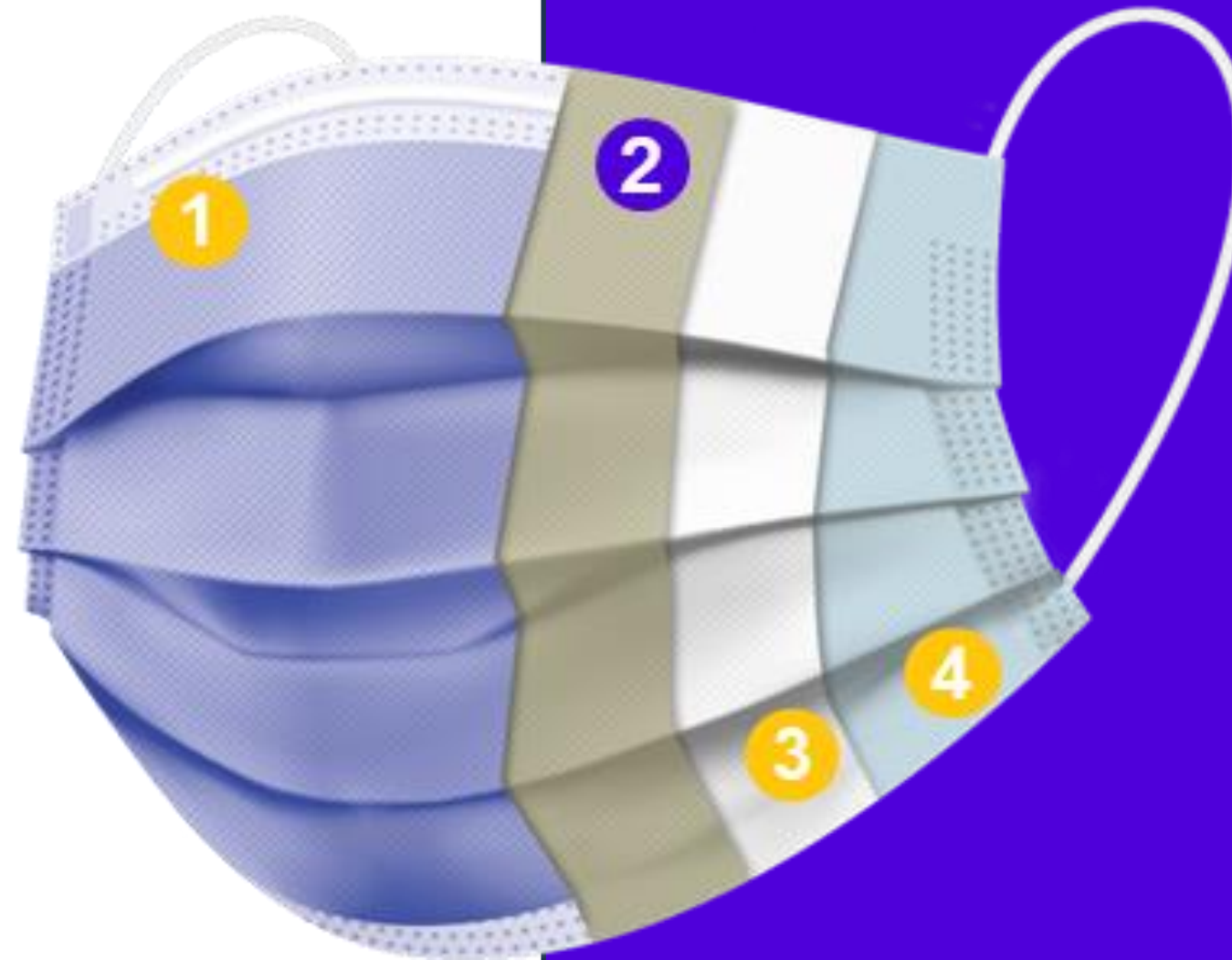
## Validation

- Extended Abstract/3-Page article "ASHRAE Standard 241 and Graphene Silver-Coated MERV-A 9-A Filters: A Case Study" accepted for presentation at ASHRAE Annual Conference in Indianapolis, IN June 2024. *Sridhar, D., Owen, K., Shacklock, R. & van der Kuur, C.*



## Same Validation, But Closer.

ZenGUARD™ Surgical Masks offer enhanced viral filtration, making them ideal for higher risk settings.



- 1 Hydrophobic exterior
- 2 ZenGUARD™ antimicrobial layer
- 3 Melt-blown layer
- 4 Hydrophilic interior





## Manufacturing Centre (Guelph, Ontario)

The facility is a 26,000-square-foot industrial building dedicated to producing ZenGUARD™, it handles the production, material coating, and slitting operations and has the potential to produce over 20 tonnes of ZenGUARD™ annually. This potential output capacity ranks it among the world's most significant nanomaterial production sites.





# Multivalent Aptamers

Rapid Drug Development Platform using  
Multivalent Aptamers

Q2 2024

Unlocking the Power of Aptamers to  
Deliver Targeted Treatments.

Trier Biosciences (Trier) is developing  
an aptamer-based therapeutic  
development platform in partnership  
with McMaster University that seeks to  
accelerate innovation in the  
biomanufacturing and life sciences  
industry worldwide.



## Forward Looking

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Pioneering a transformative aptamer platform with breakthrough potential for the development of new treatments.

## Promising Results

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Preclinical trials have demonstrated efficacy that has matched or exceeded monoclonal antibodies.

## Vast Market Potential

There are nearly infinite different aptamer combinations that exist. This vast universe of sequences has the potential to address unmet, (or underserved) needs, by creating or delivering novel treatments for diseases affecting humanity.



# Development Process

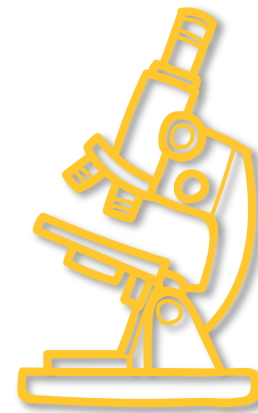
## Create a Selected Library

From a large pool of nucleic acid sequences, select a group of high-performing potential aptamers



## Select a Target Molecule

Identify which surface protein, biomarker, etc. our aptamer will specifically bind to with optimized affinity



## Select and Optimize Candidates

Refine aptamer selection and determine best candidate based on binding affinity, specificity, media stability, etc. including patented structural enhancements that improve the overall performance of aptamers



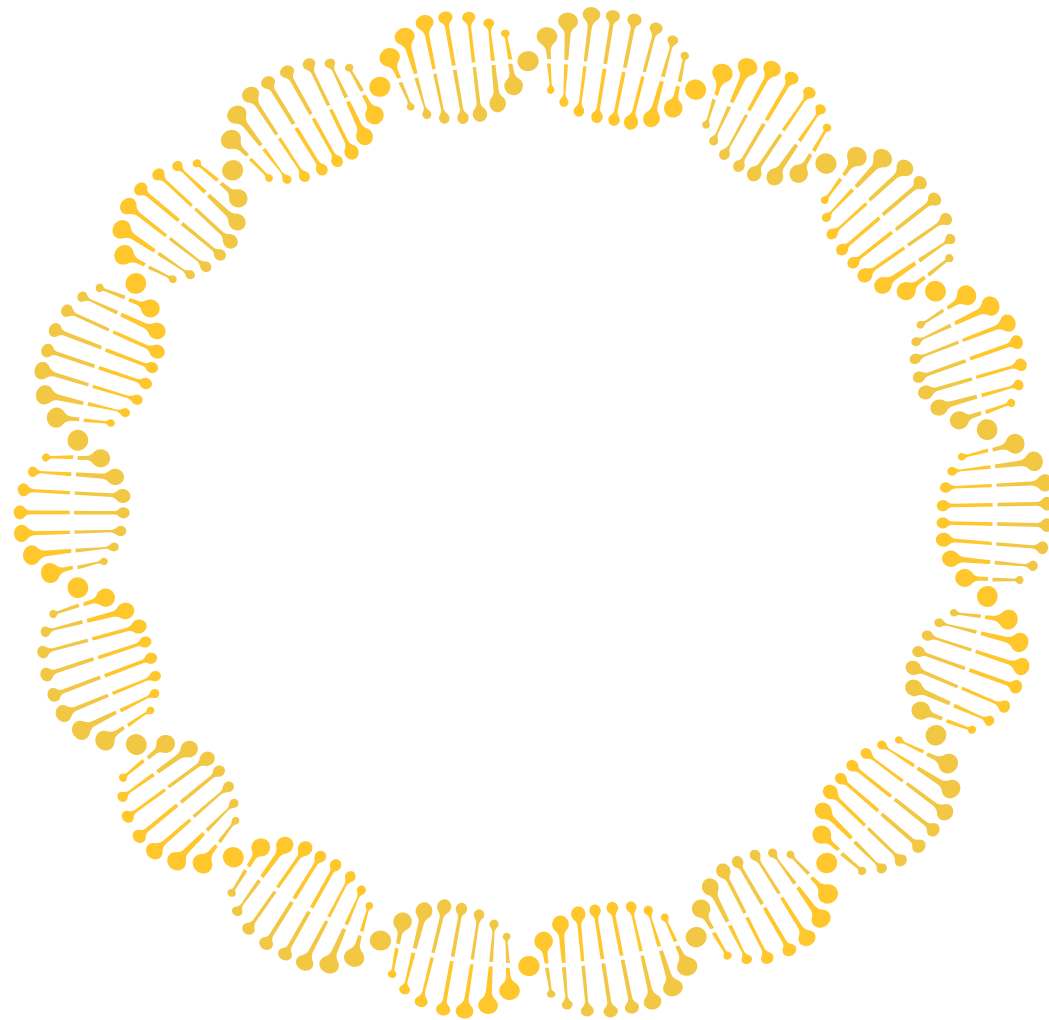
## Validate Performance

Test candidates in vitro and in vivo for efficacy, safety, delivery, pharmacokinetics / dynamics, and other factors



Individual aptamers are a unique random sequence with different physical structures, affinities, and binding domains. Through the SELEX process and our improved techniques, Trieria is positioned to potentially find those sequences that can help the most people.





## Safety

Aptamers have demonstrated consistently safe profiles in clinical trials.

## Binding Affinity

Tunable binding affinity from 10 pM up to 10 nM, allowing binding to match requirements. Improved aptamer selection has increased the efficacy of the lead aptamers performance as a therapeutic.

## High Performance

Irreversible binding to target, universal binding to existing and emerging variants, comparable in vivo protection to mAbs.

## Manufacturing Scalability

Aptamers are produced synthetically as opposed to biologically, improving on consistency, safety and quality.

# Aptamers – The Next Innovative Therapeutic Modality

**ap·ta·mer, *noun*** : Short nucleic acid chains which are selected to bind electrostatically to their targets with extreme affinity and specificity.



## Cost to Develop

Less than \$1M for optimized pre-clinical candidate



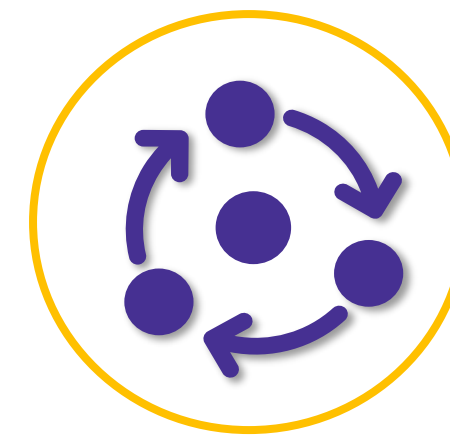
## Development Time

Less than five months from target identification to lead candidate



## Safety

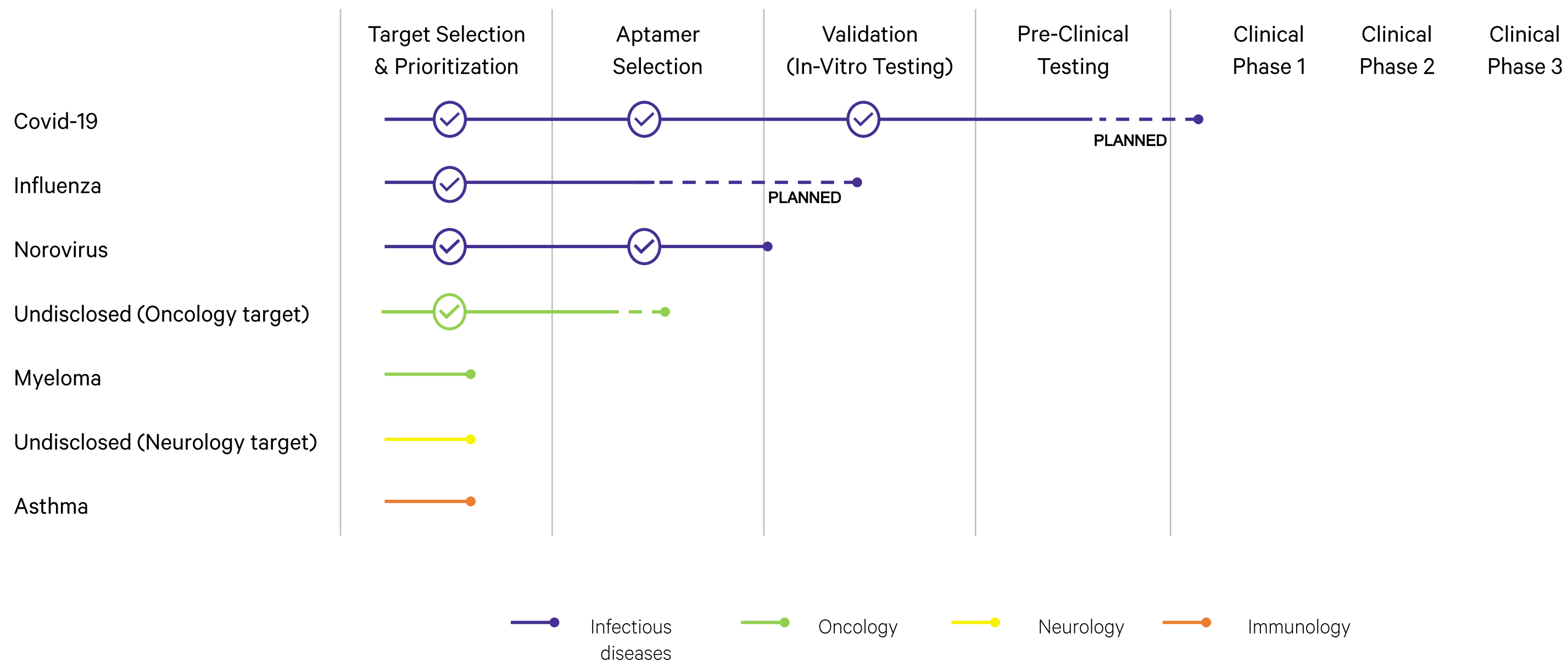
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# Triera's Current Pipeline Using the Rapid Drug Discovery Technology



Platform validation is Triera's top priority.

We will prioritize targets with partners that can accomplish this as quickly as possible



# Albany Graphite Corp.

Potential to Support the Electric Vehicle  
Revolution with Unique Natural Graphite

The Albany Graphite Project is a large-scale graphite deposit being prepared for future mining. It's situated near the towns of Constance Lake First Nation and Hearst in Ontario, not far from the Trans-Canada Highway, and is surrounded by accessible infrastructure like roads, a railway, power lines, and a gas pipeline. With 521 mining claims in the area, the project is currently in the late stages of exploration





# Albany Graphite Project

## Global Need

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Graphite is a critical mineral for governments in Canada, Europe, and the United States, given its importance to the world's energy transition.

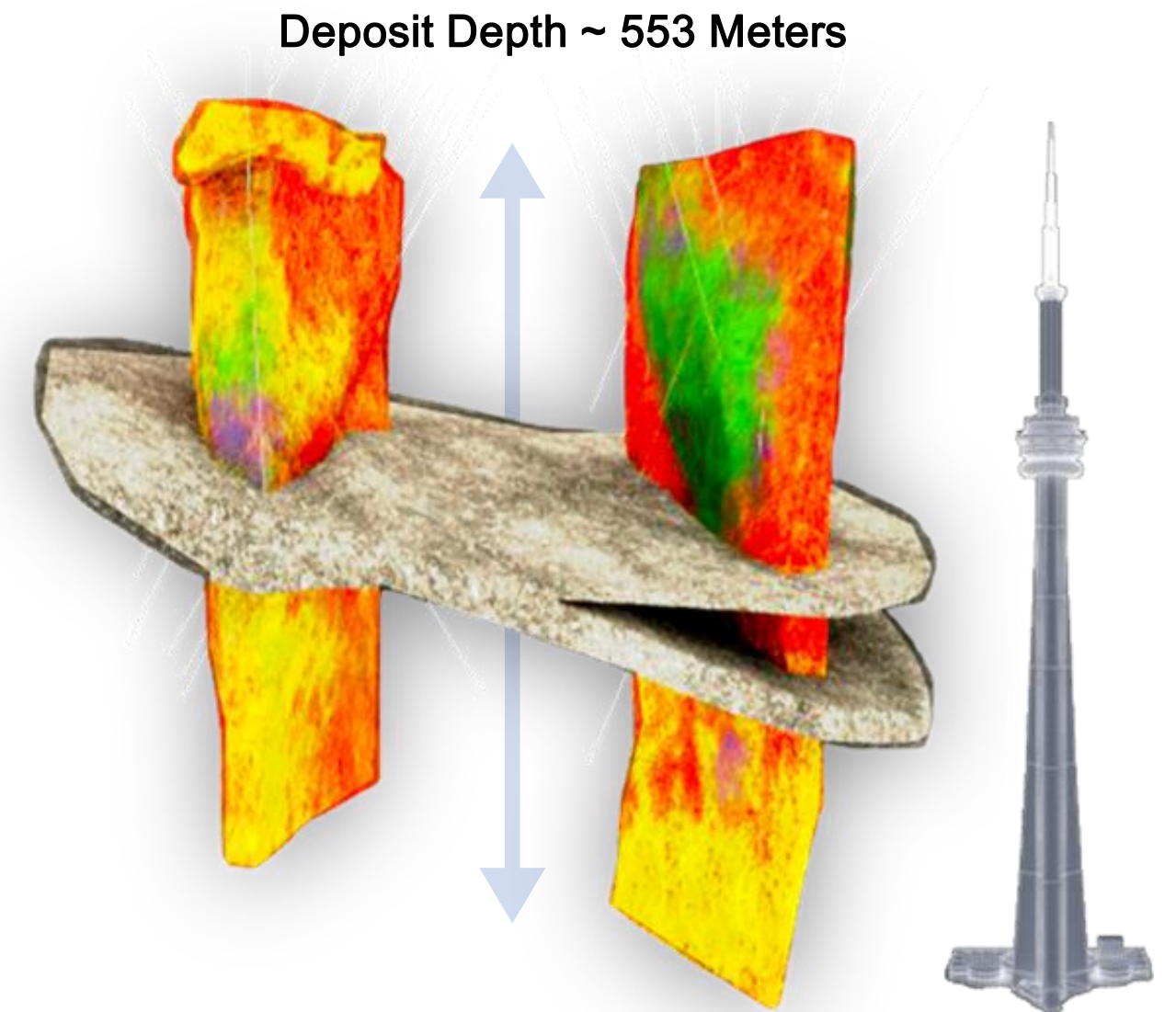
## Unique Properties

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Albany graphite is easy to exfoliate and is ideally suited for making high-quality graphene for advanced technical uses. Unlocking this resource, and a made-in-Canada source of graphite and graphene will be beneficial for Canadians into the future.

## Zentek Owned

Zentek owns 100% rights to the Albany deposit, with a signed implementation agreement with the Constance Lake First Nation (CLFN) that sets out the governance, roles, responsibilities, and activities for establishing a Project Partnership Structure.





# The Graphite Global Picture



## Analysis Reports

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A report done by Benchmark Mineral Intelligence [5](#) projects the graphite market to be in a significant production deficit over the next decade, equivalent to approximately eight times the current level of production, the demand for North American sourced graphite is expected to soar.

## Demand for EVs In Canada

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Canada is positioned to be a clear leader in the zero-emission vehicle industry, a domestic graphite source and integrating it with processing, manufacturing, and recycling is essential to create a full and secure supply chain. [6](#)

## Lithium-Ion Batteries

Graphite makes up 95-99% of the anode (negative electrode) material in lithium-ion batteries which is 28.1% of the total battery. [7](#)



# The Inflation Reduction Act

The Inflation Reduction Act is a landmark U.S. legislation aimed at addressing inflation and investing in the nation's energy and healthcare sectors. The Act focuses on several key initiatives, however Albany fits in the energy and climate section of the legislation. The legislation highlights the need for North American Minerals for electric vehicles (EVs), a main component for EV batteries is Graphite.

The main issue with Graphite is that it is not commonly produced in North America but heavily imported from China.[8](#)

Albany's deposit can help support this North American focused legislation.

## North American Vehicles

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Vehicles must undergo final assembly in North America, and as of 2024 vehicle may not contain any battery components manufactured by a foreign entity of concern as of 2025 vehicles may not contain any critical minerals that were extracted, processed, or recycled by a foreign entity of concern.

## North American Minerals

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In 2023, 40 percent of the value of the critical minerals contained in the battery must be extracted or processed by a foreign entity of nonconcern, moving up 10% yearly until the beginning of 2027, when the applicable percentage is 80 percent.

## North American Components

In 2023, 50 Percent of the value of the battery components must be from a foreign entity of nonconcern, moving up 10% yearly until the beginning of 2029, when the applicable percentage is 100 percent.

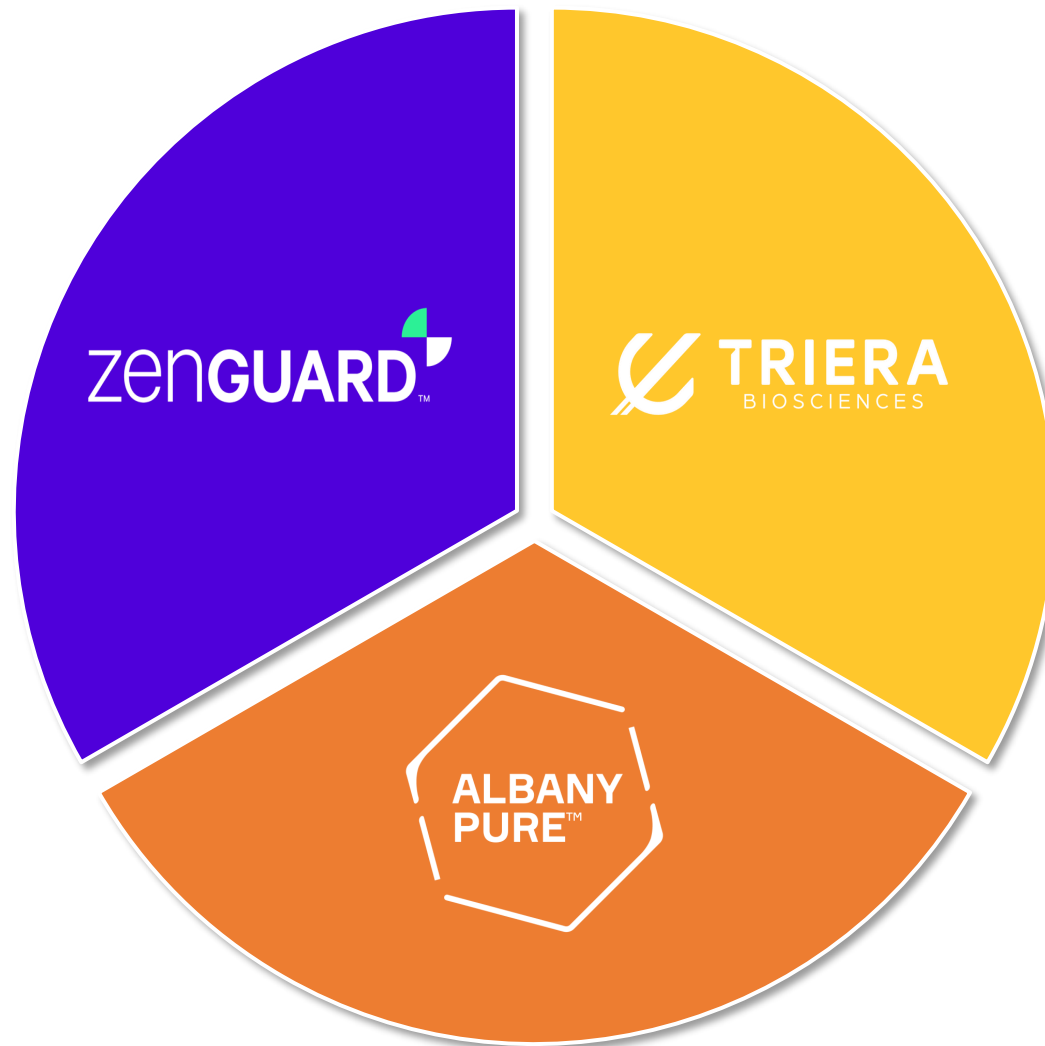




# Why Zentek?



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