



# GRAPHEX GROUP LIMITED

DECEMBER 2021

OTCQX: GRFX  
HKSE: 6128  
[WWW.GRAPHEXGROUP.COM](http://WWW.GRAPHEXGROUP.COM)

# Forward Looking Statement

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All statements contained herein other than statements of historical fact, including statements regarding our future results of operations and financial position, our business strategy and plans and our objectives for future operations, are forward-looking statements. The words “believe,” “estimate,” “anticipate,” “expect,” “plans,” “intend,” “may,” “could,” “might,” “will,” “should,” “approximately,” “potential,” and similar expressions are intended to identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including those described in the “Risk Factors” section of the prospectus. Moreover, we operate in a very competitive and rapidly changing environment. New risks emerge from time to time. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties and assumptions, the future events and trends discussed in this prospectus may not occur and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements.

Neither Graphex Group Limited, nor any of its officers, employees, advisers, or agents make any representation or warranty, express or implied, as to any matter or as to the truth, accuracy, or completeness of any statement made in this presentation, made in conjunction therewith or in any accompanying materials or made at any time, orally or otherwise, in connection with the matters referred to herein and all liability in respect of any such matter of statements.

Additional Information: Please refer to our annual report filed with the Securities and Exchange Commission, and available on our website at [www.graphexgroup.com](http://www.graphexgroup.com) in the Investor Relations section. We assume no obligation to provide revisions to any forward-looking statements should circumstances change, except as otherwise required by applicable laws.

# Graphex Group Overview

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- **We manufacture key materials for Li-Ion batteries:** used in electric vehicles and for renewable energy storage
- **Our primary product is high volume purified spherical graphite:** manufactured at our factory in Heilongjiang province, strategically located next to our raw material supplier
- **23 patents and utility models:** for manufacturing, processing, equipment and applications of graphite & graphene technology
- Technology and experience in eco-sensitive renewable energy design projects
- LTM revenue Dec 2020: \$51 million<sup>1</sup>, EBITDA profitable, dual listed: OTCQX(GRFX) HKSE(6128)
- We produce about **5% of China's Purified Spherical Graphite supply**

Source: <sup>1</sup>Annual report (December 2020); computed at USD/HKD exchange rate of 7.75



# We produce products and develop technologies for enhancement of renewable energy



## Our Mission

The company is principally engaged in the development of technologies and processes for renewable energy



## Creating Value

We focus on the enrichment and manufacturing of spherical graphite, a key component for electric vehicle lithium-ion batteries, and advanced renewable stored energy solutions.



## Competitive Moat

With our existing collection of 23 patents and utility models covering various technological, design, and processing applications for graphite and graphene technology, we seek to further enhance global renewable energy initiatives.

# Key Team

Our single strongest asset is our highly skilled and dedicated people. With over 80% of our employees holding a degree or higher qualification, our industry specialists are a key differentiator, enabling us to create significant value for our customers.



**Andross Chan**

- ❖ Chief Executive Officer: joined the group in 1991 as the Managing Director
- ❖ Andross has been the CEO since 2013
- ❖ 34 years of experience in operations and management



**Mr. John DeMaio**

- ❖ President of the graphene division: 35 years of experience in executive leadership and operational management in the energy and infrastructure sectors.
- ❖ President, CEO, and Board Member of JouleSmart Solutions, GM of Siemens Smart Infrastructure, Vice President of MWH Global, COO of Thompson Solar Technologies



**Dan Nye**

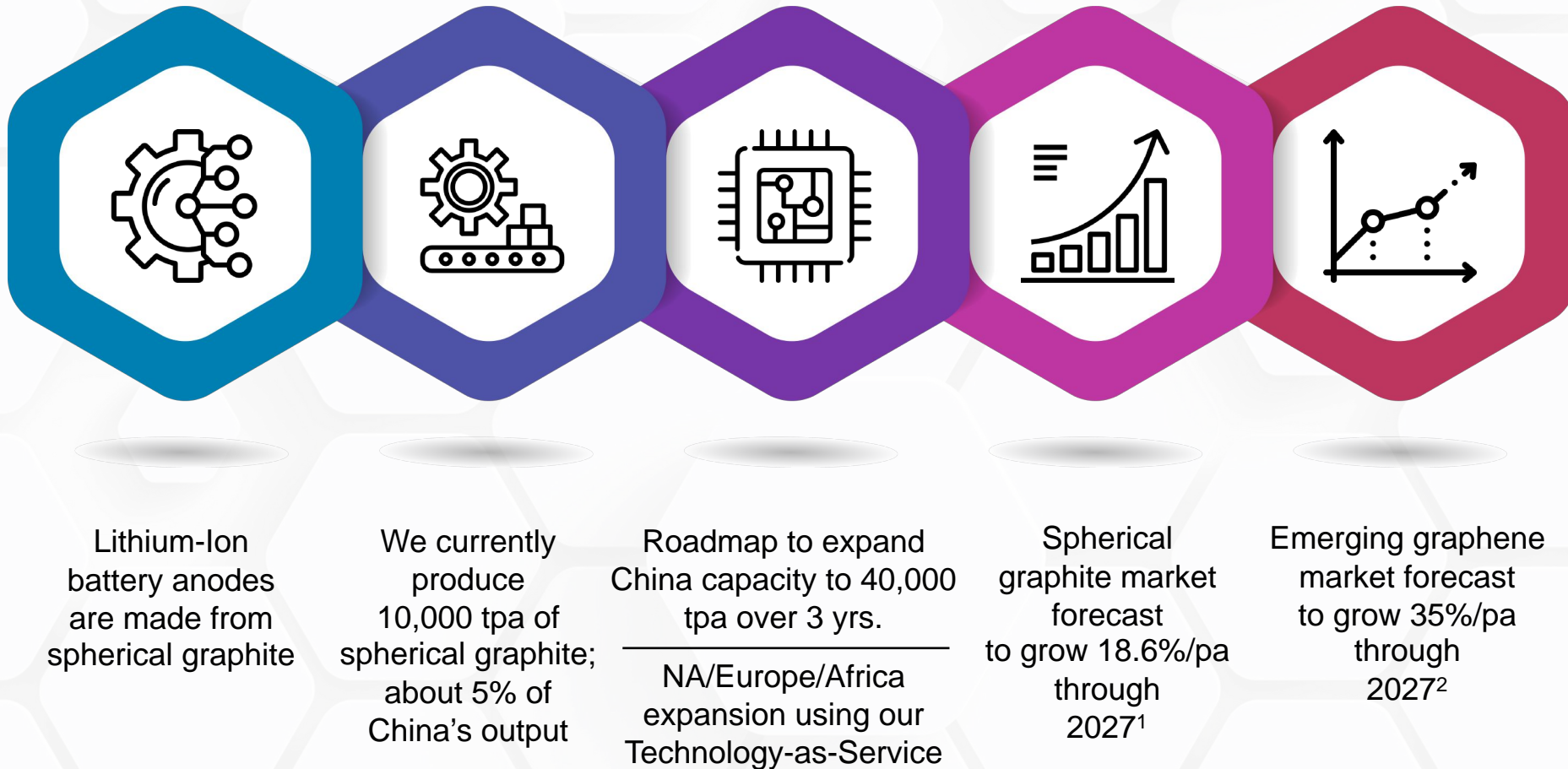
- ❖ Chief Strategy Officer: 20 years investing into and building technology businesses
- ❖ Bain & Company, Deutsche Bank, CIM Investment Management, US Navy Submarine Officer
- ❖ Harvard Business School MBA, Boston University BSc Manufacturing Engineering, MSc Nuclear Engineering



**Professor Liqun Luo**

- ❖ Head of Research: Prof. Luo obtained his Phd in Engineering and Mineral Processing from Wuhan University
- ❖ Professor and Senior Engineer at Wuhan University, and a visiting scholar to the University of Queensland
- ❖ Professor Luo is an expert in mineral processing

# How Do We Participate in the EV Lithium-Ion Battery Market



Source: <sup>1</sup> Emergen Research, <sup>2</sup> Global Market Insights

# Primary Products



## Spherical Graphite (SG)

Our primary product. A key material for production of anodes for lithium-ion batteries used in electric vehicles and grid energy storage.

The market trend is towards finer SG, a capability we already have



## High Purity Graphite (HPG)

A by-product with over 99.9% carbon and less than 0.2% of moisture; superior electric and thermal conductivity, resistance to corrosion, and chemical stability.

Applications include refractory materials and advanced coatings.



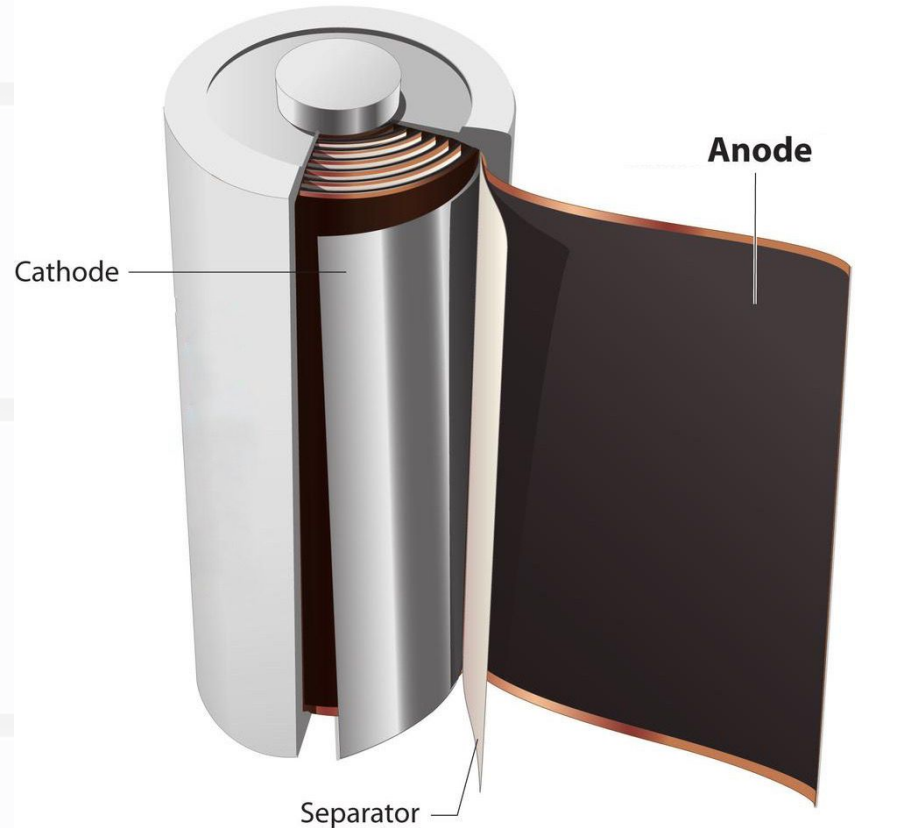
## Micronized Graphite (MG)

A by-product with oxidation resistance under temperature, lubricative, formability, electric/thermal conductivity, adhesive properties.

Used in corrosion resistant coating, lubricants and composite materials.



# Largest Current Use of Graphene: Electric Vehicle Lithium-Ion Batteries



## Typical EV Li-Ion Battery Cell

- Spherical graphite is used by anode makers to form the graphite electrode (anode) of a Li-Ion battery cell.
- When charging, Li-Ions migrate from the cathode, across the separator, and are stored between layers of graphene within the graphite electrode
- The positively charged Lithium ions in graphite electrode are attracted to electrons from the cathode, and as a result store energy
- During discharge Lithium ions flow back to the cathode from the graphite electrode.
- The attracted electrons on the graphite electrode return to the cathode. As they cannot pass through the electrically insulated separator, they instead travel through the battery terminals and power the EV.

Source: Learn Engineering; note Cathode is a NCA material made from Lithium Nickel Cobalt Aluminum Oxides; separator is PVC or Polymer film; 85KW battery has 7,104 cells



# Our Competitive Advantage

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- Stable Raw Material Supply: our factory is located next to world's largest high-quality flake graphite source
- IP: 23 patents on production methods, equipment design, environmental protection and graphene applications
- Proprietary expertise: in volume SG production at high yields
- High Quality Product: our 6-9 micron spherical graphite is ready for advanced batteries





# Powering Our Growth: Electric Vehicles

- Each EV uses about 70kg of spherical graphite<sup>1</sup>, or 1kg/kw
- 2019 Spherical graphite demand in China alone was 200k tons; in 2020, this climbed to 230-240k tons
- By 2026 EV's forecast to consume 1,250k<sup>2</sup> tons of spherical graphite/year
- Significant deficit if new supply not added
- **We produce about 5% of China supply**

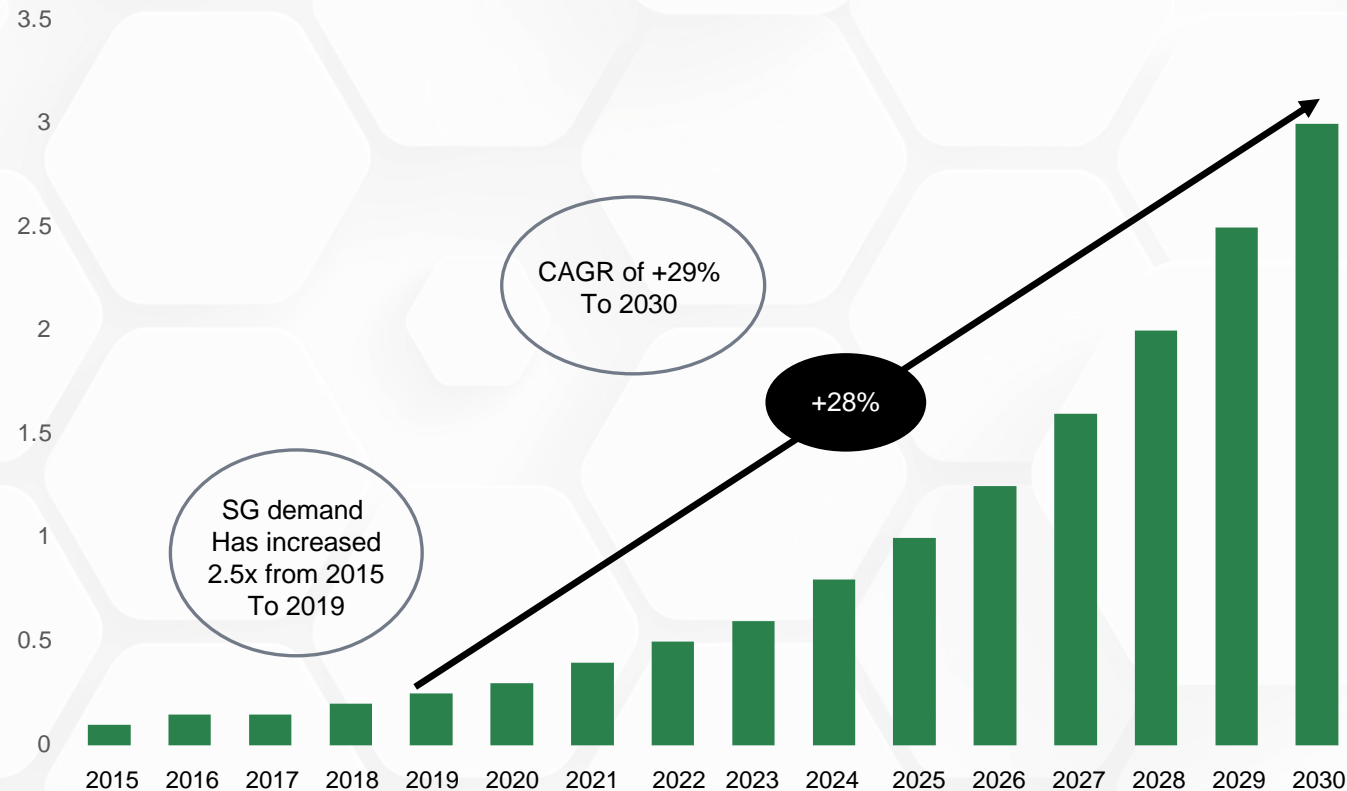


Source: <sup>1</sup> The Minerals, Metals & Materials Society (TMS), Materials and Processing for Lithium-ion Batteries, journal Vol. 60 No.9, Sep 2000 Issue; <sup>2</sup> Benchmark Mineral Intelligence

# EV Momentum is Driving Unprecedented Demand for Spherical Graphite

SG is used almost exclusively for lithium-ion battery applications and therefore provides more direct exposure to growth in the EV sector.

## Spherical Graphite Demand

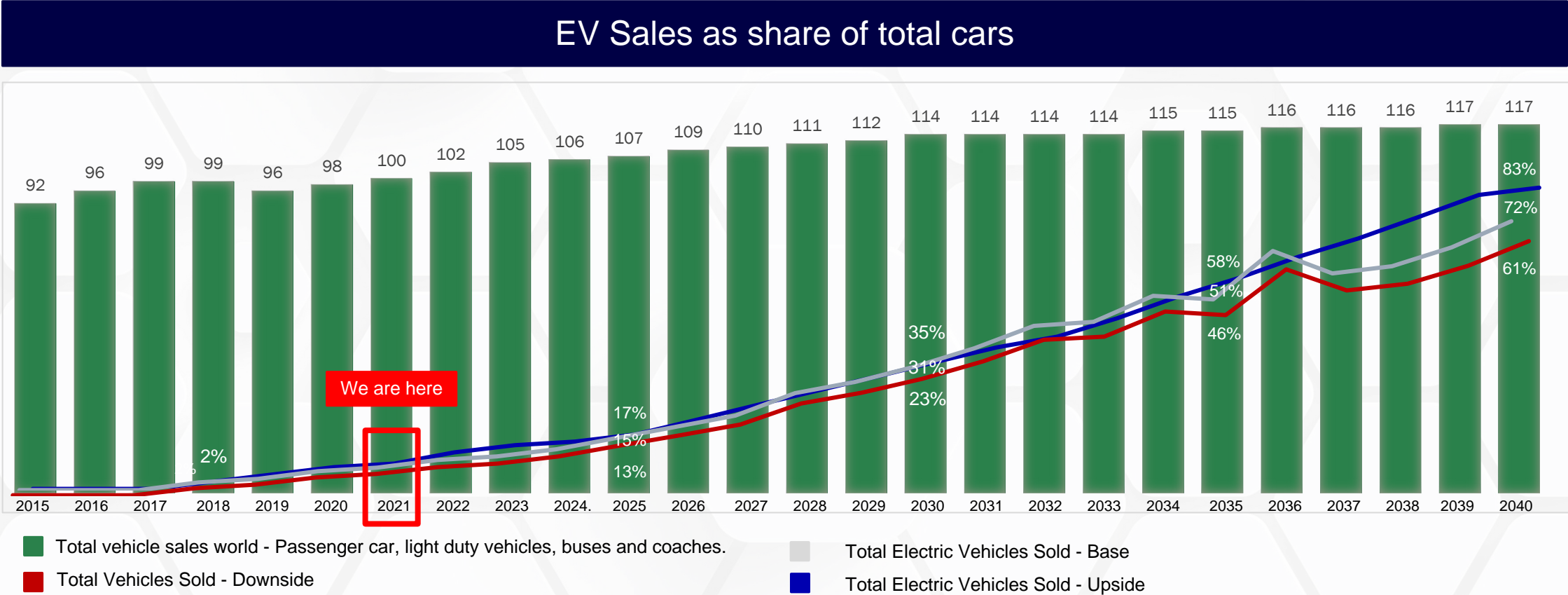


Source: Benchmark Mineral Intelligence

- Industry forecasts show strong demand for graphite as an anode product, dominating volumes for decades
- Power battery anodes use a blend of natural graphite flake SG and synthetic SG. Synthetic SG is usually made from coke.
- Natural graphite SG is expected to increase market share due to its favourable environmental footprint as cost of synthetic feedstock increases and OEMs become increasingly focused on the environmental footprint of the supply chain
- Silicon will largely be used as an additive to graphite-dominant anode blends
- New technologies are expected to take time to commercialise and will see limited mainstream uptake until the mid-2020s, but more likely beyond 2030 (e.g. solid state)

# Global EV Growth is Creating a Paradigm Shifting Event for Battery Minerals

Start of a global mega trend that will drive for minerals needed for lithium-ion batteries.

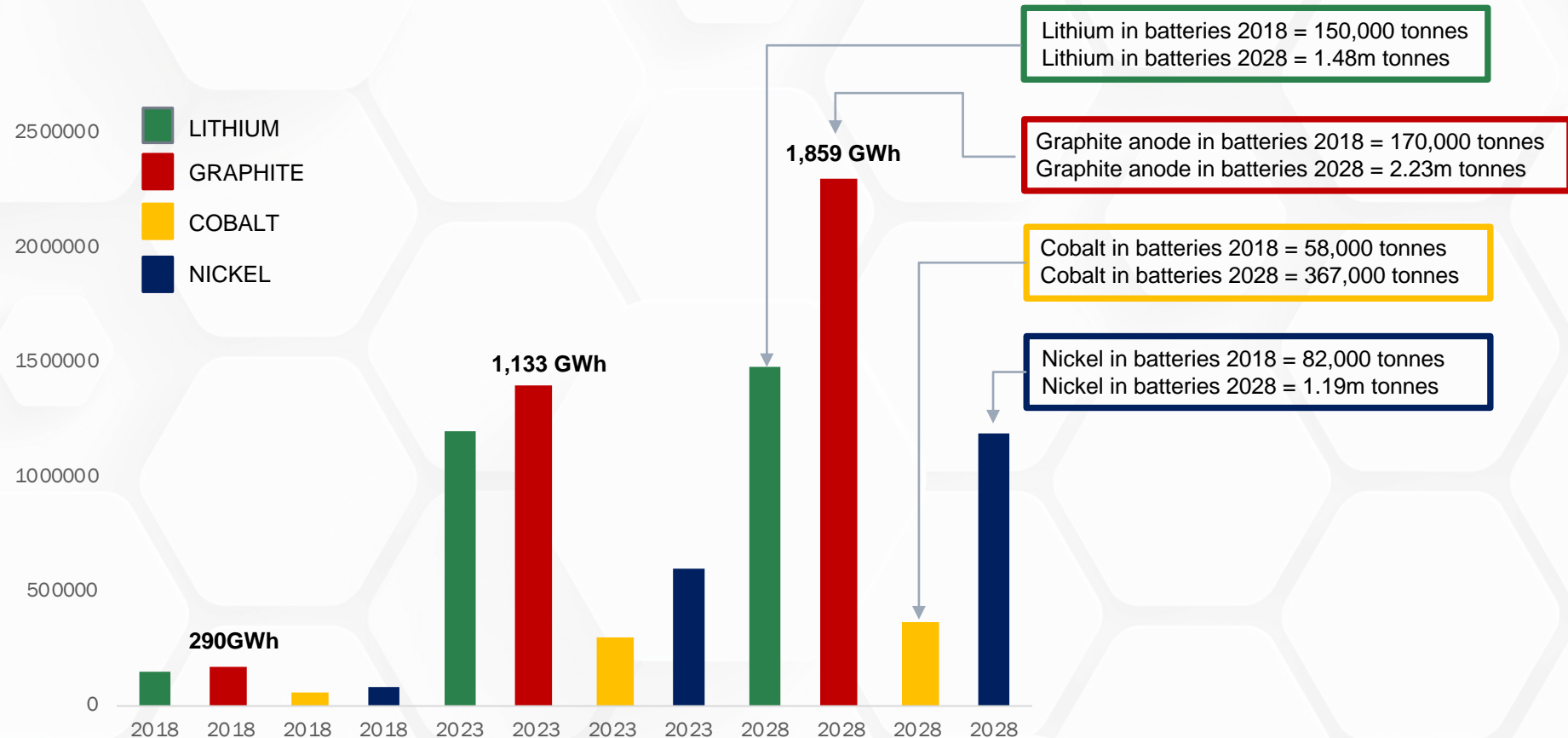


Source: Benchmark Mineral Intelligence



# The profound impact of the megafactories on raw material demand

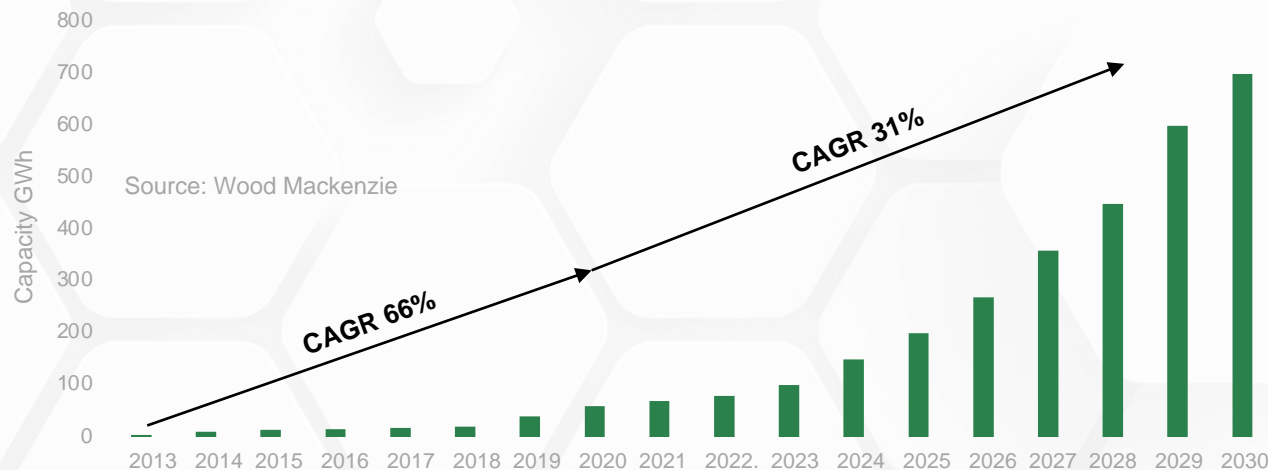
Assuming a 100% utilisation rate, these are the numbers...



Source: Benchmark Mineral Intelligence

# Powering Our Growth: Renewable Energy Storage

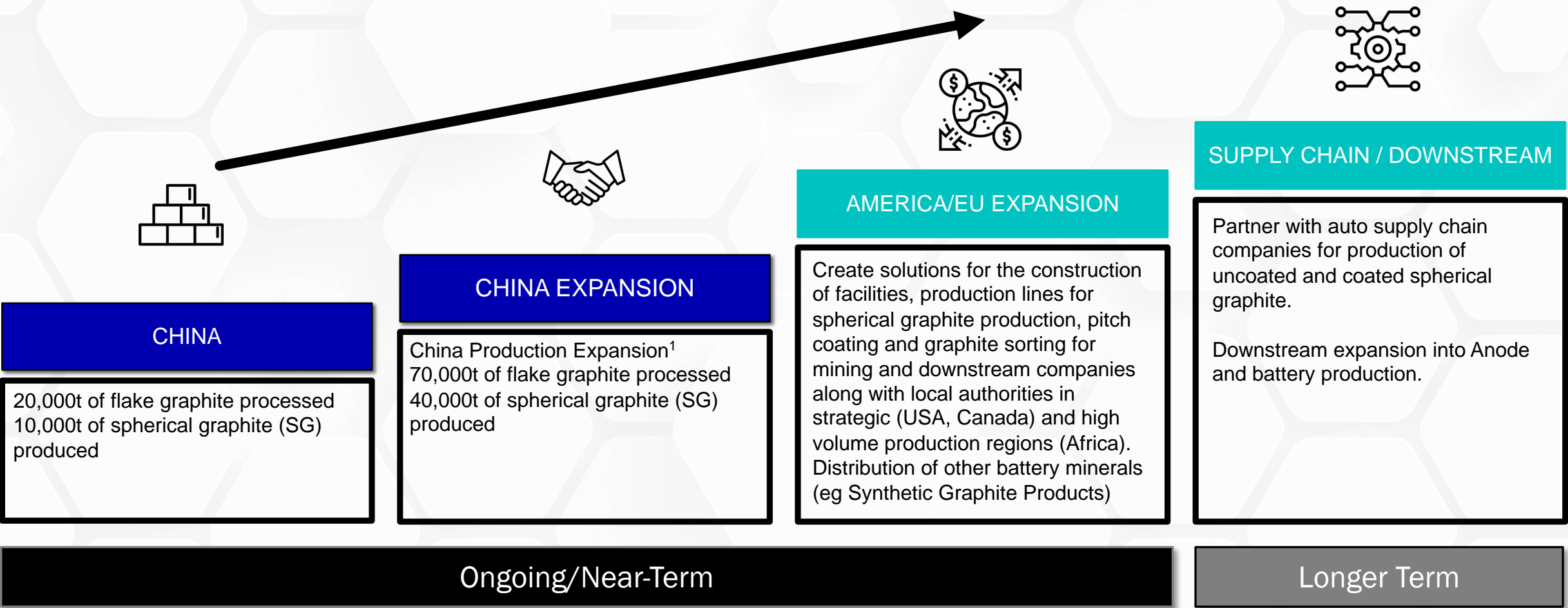
- Batteries used to store excess renewable energy, such as solar or wind
- By 2025, 62 GWh battery energy storage will be added per year
- Battery storage technologies (Li-Ion, Vanadium) consume at least 1kg of graphite/kw
- This will need an additional 62k tons/yr spherical graphite by 2025<sup>1</sup>



<sup>1</sup> Source: Investorintel.com, "Why Tesla and the World are Looking at Graphite"



# Organic Growth Strategy



# Graphex's China SG Supply Opportunity

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**Competitive advantage offered by proximity to both a high-quality graphite mine and major Chinese Lithium-Ion battery makers:**

**Our production is efficient**

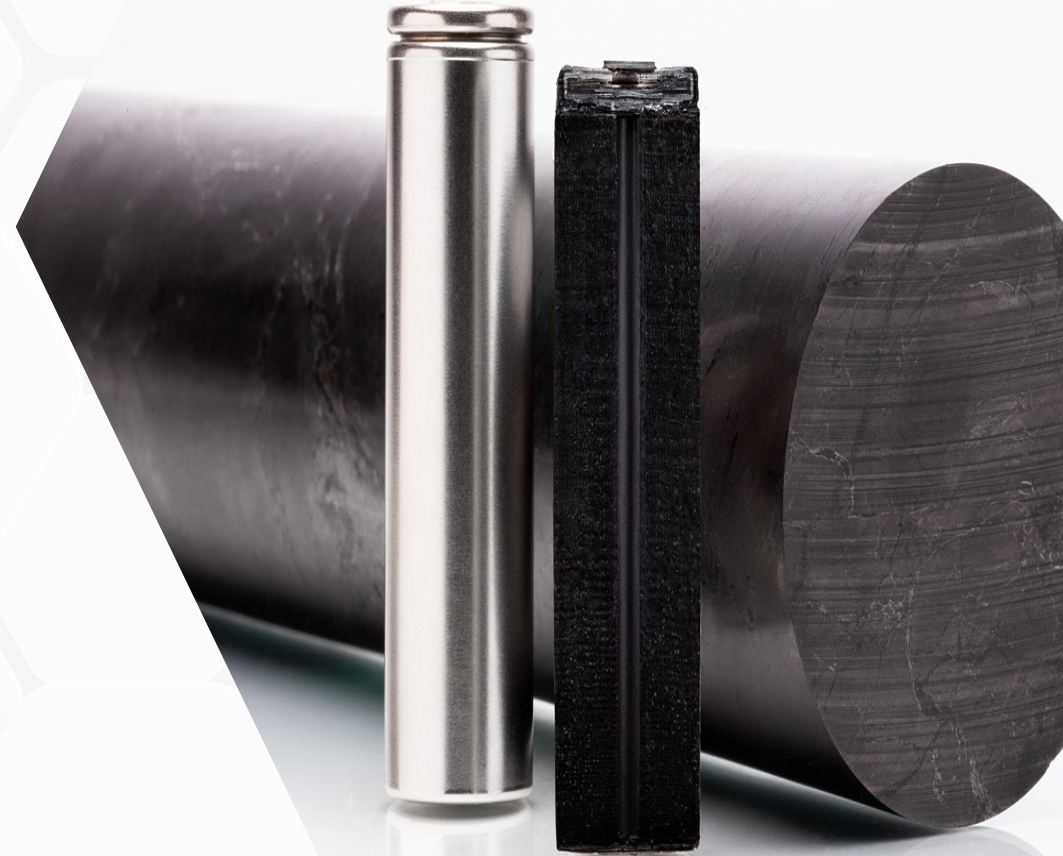
- Highly efficient conversion of Raw Graphite to spherical graphite
- Average yield in excess of 50% for current production line
- Expected 60% yield for 30,000 ton per annum expansion

**We use responsibly extracted natural graphite**

- Not energy intensive coke-based synthetic graphite

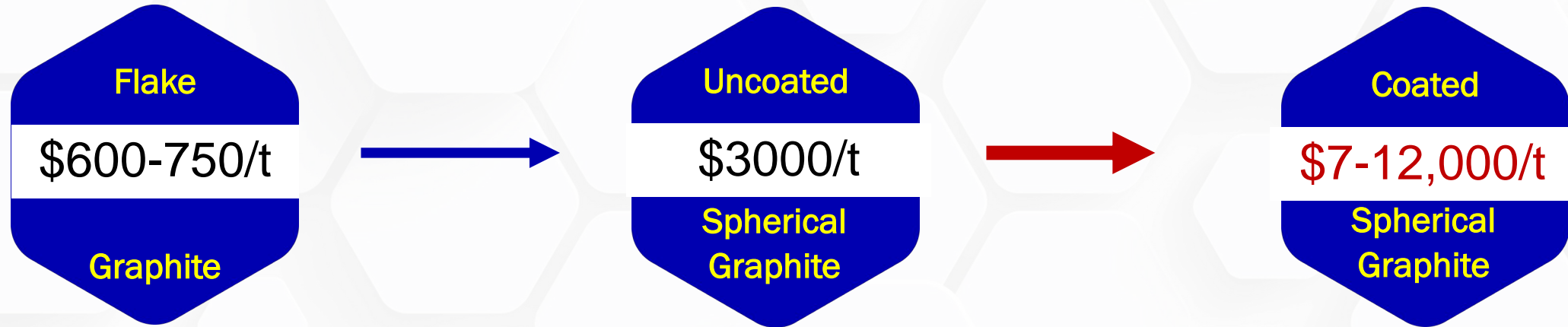
**Located next to world's largest graphite mine in Heilongjiang province**

- Short/efficient supply chain for our raw input materials and proximity to our customers





# Graphex's Technology-as-a-Service Opportunity



Utilizing our processing technology and proprietary expertise, graphite miners can process and upgrade less valuable flake graphite into *uncoated or coated Spherical Graphite (SG)*.

The value of uncoated SG is up to 5x that of mined raw flake graphite.

Pitch coated spherical graphite is up to 20x that of mined raw flake graphite. In 2020, Western OEMs paid an average of \$9,500/tonne for coated spherical graphite for their EV battery cells.<sup>1</sup>

**With proprietary knowledge in manufacturing spherical graphite, at volume, with high yield and at battery grade quality, we believe we can create additional shareholder value by marketing our technology as a service.**

<sup>1</sup> Leading Edge Materials, April 25<sup>th</sup>, 2021

# Investment in Internal Research



Continuous development of manufacturing yield / process technology and end-use applications












































23 issued patents and utility models protecting intellectual property

Forefront research includes ultra-low temperature anode material & silicon-carbon composite anodes

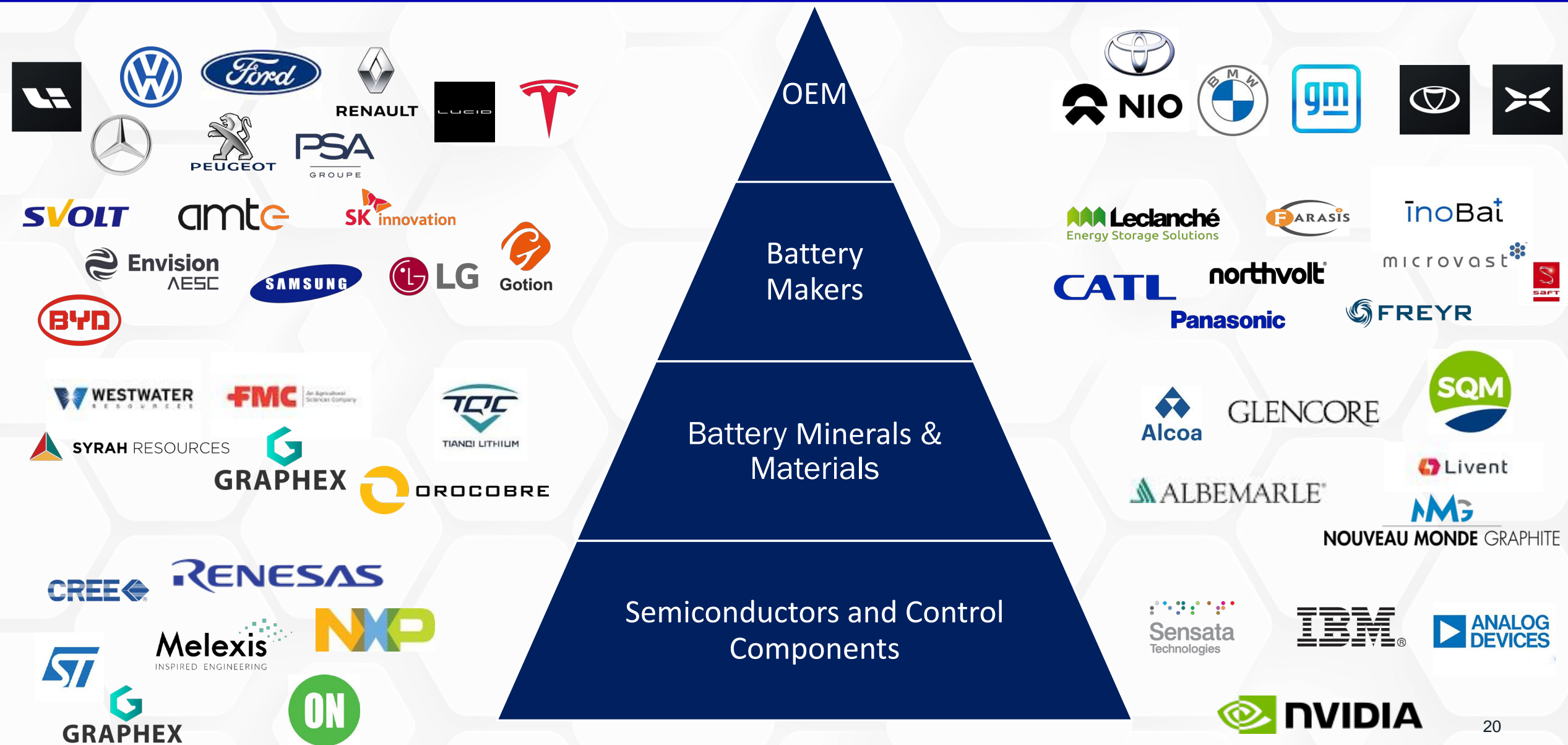
Actively work in partnership with customers, universities and research institutes

SG production processes, advanced anode technology and graphene research led by head of research, Professor Luo Liqun

# EV Makers committed to LiB technology for expansion-advances required for commercial transition to solid state

EV Manufacturers							
Current Battery Suppliers	  	    	   	  	 	    	
Future Battery Suppliers		    <div>Targeting partnerships in Europe for 240GWh by 2030</div>		  <div>Targeting partnerships in US for 70GWh by 2025</div>	   <div>Targeting partnerships in Europe for 65GWh by 2025</div>		  <div>Targeting supply Arrangements and partnerships in US and Europe for 260GWh by 2030</div>
Transition Plan	LiB→LiB→LiB→	LiB (AG anode) SSB from 2025	LiB→LiB→LiB→	LiB SSB→ from 2025	LiB→LiB→LiB→	LiB SSB→ from 2025	LiB Fe-Mn-&Ni-Mn SSB→ from 2025

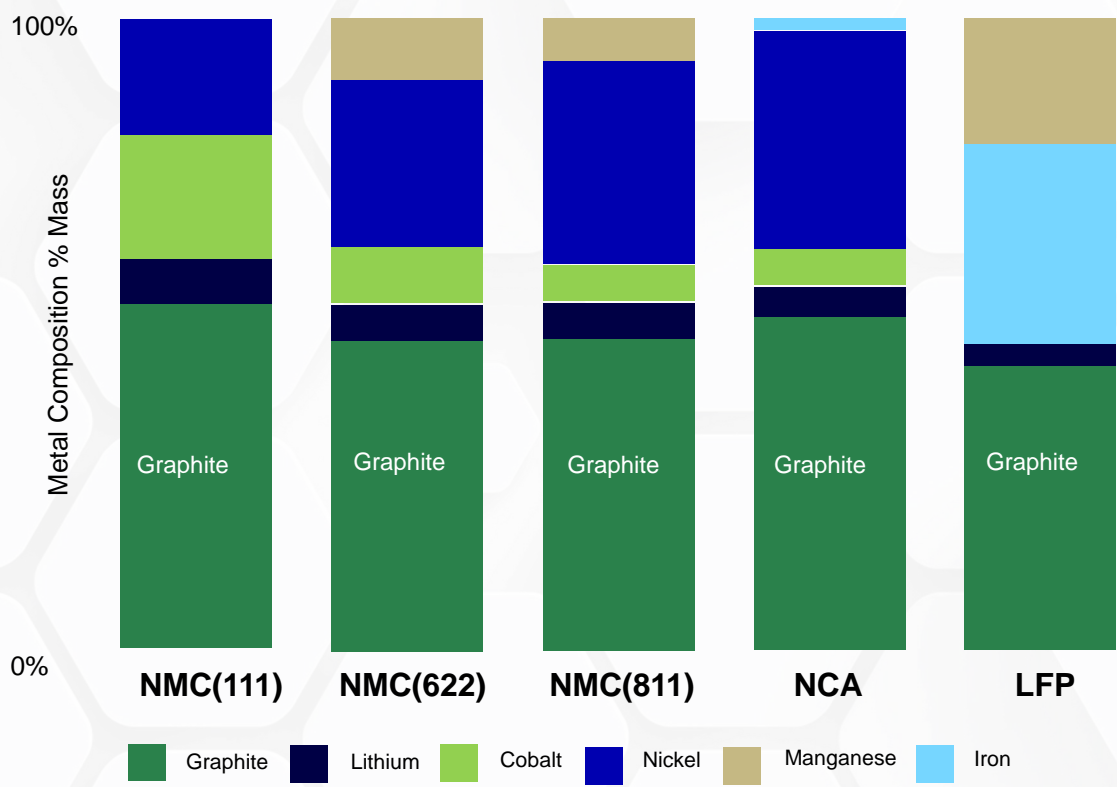
# A Sample of Key Participants in the EV Battery Chain





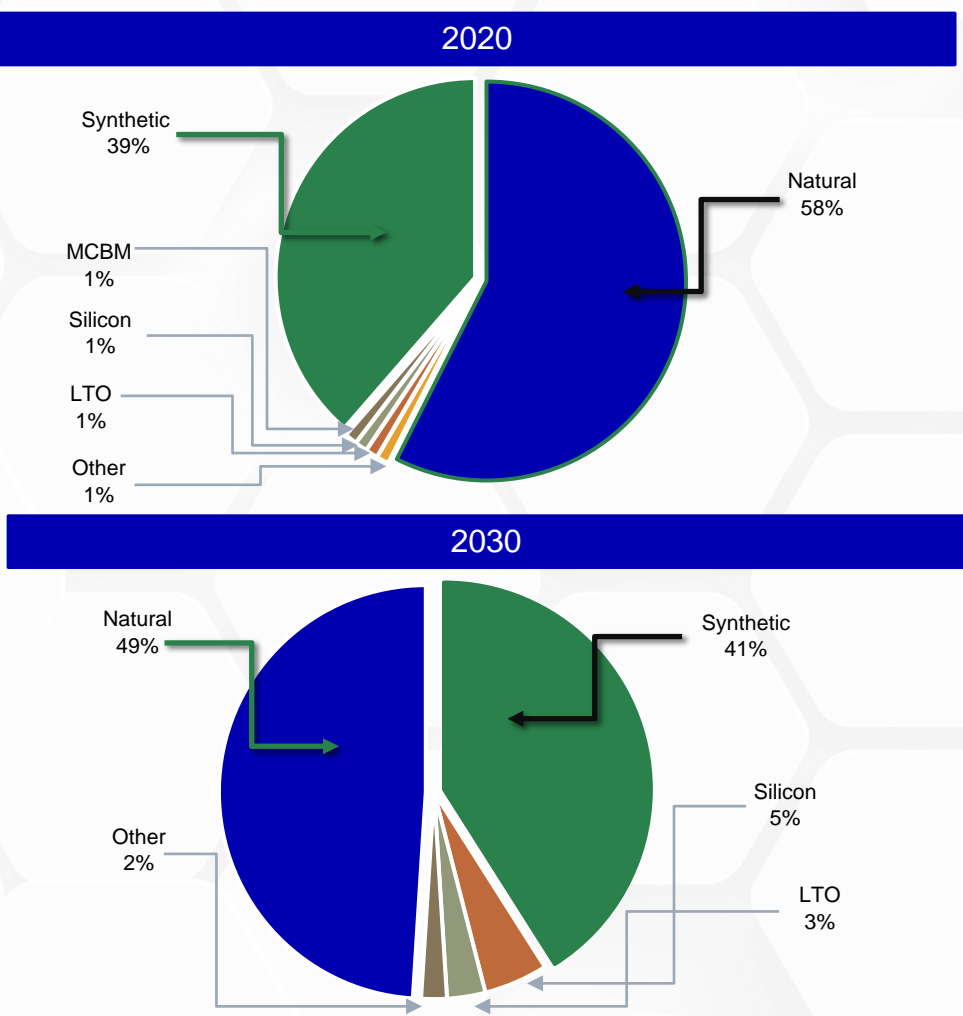
# Graphite is a high intensity material in EV batteries - Costs/emissions expected to drive shift towards natural graphite

Battery Mineral Composition of Batteries



Source: Syrah Resources analysis, data from Gaines, L., Richa, K., & Spangenberg, J. (2018) Key issues for Li-ion battery recycling (excludes oxygen), Benchmark Minerals Intelligence. NMC: Lithium nickel manganese cobalt oxide battery. NCA: Lithium nickel cobalt aluminum oxide battery. LFP: Lithium iron phosphate battery.  
1. Shown as percent of the total sum by elemental mass featured in the analysis for each battery chemistry, excludes oxygen (cathode).

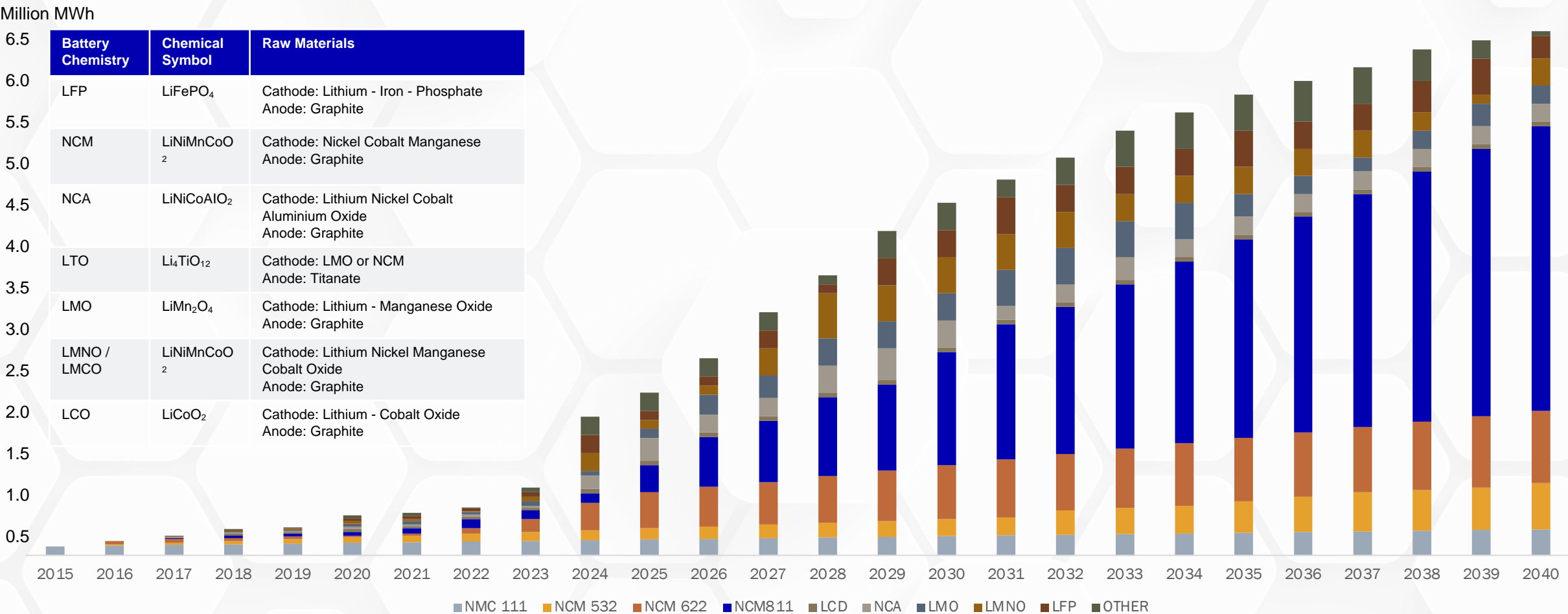
Natural Graphite Demand for Batteries



Source: Benchmark Minerals Intelligence Flake Graphite Forecast, Q2 2021

# Graphite is an Essential Part of the Transition to Lithium-Ion Batteries

Increasing amounts of natural graphite will be needed to meet projected lithium-ion battery growth



# In addition to Asia, both Europe and US will have strong demand for SG

For example, European Li-ion battery manufacturing will require 500,000tpa of graphite anode by 2029



**Germany, 2024**  
10pm 6 GWh, later 24 GWh

**MORROW**

**Norway, 2024**  
8GWh, later 32 GWh

**CATL**

**Germany, 2022**  
14 GWh, later 100GWh



**United Kingdom, 2010**  
2.5 GWh

**amte**

**United Kingdom, 2023**  
10 GWh, later 35



**Germany, 2020**  
1 GWh



**Germany & France, 2022**  
16 GWh, later 64 GWh

**SVOLT**

**Germany, 2023**  
20 GWh, later 8 GWh

**TERRAE**

**Germany, 202X**  
4 GWh, later 8 GWh



**Germany, 202X**  
Capacity Unknown

SOURCE: R. ZENN, JUNE 2020 AND PUBLIC SOURCES.



**Sweden, 2021**  
32 GWh, later 40 GWh

**northvolt**

**Norway, 2023**  
Ramp up to 32 GWh + 2 GWh



**Slovakia, 2024**  
10 GWh

**inoBat**

**Germany, 2021**  
Ramp up to 8-12 GWh



**Germany, 2022**  
16 GWh



**Poland, 2018**  
15 GWh, later 65 GWh



**Hungary, 2020**  
7.5 GWh, later 23.5 GWh



**Hungary, 2018**  
3 GWh, later 15 GWh

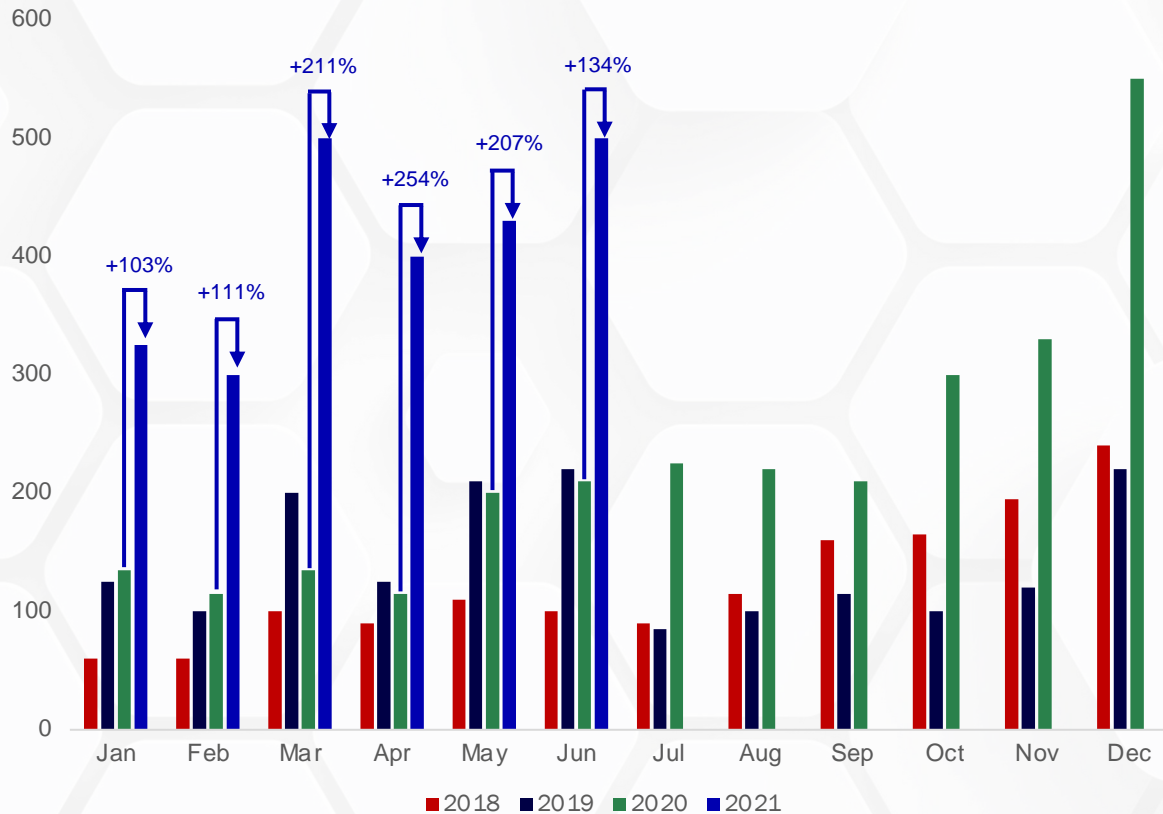


**Europe, 202X**  
Capacity Unknown



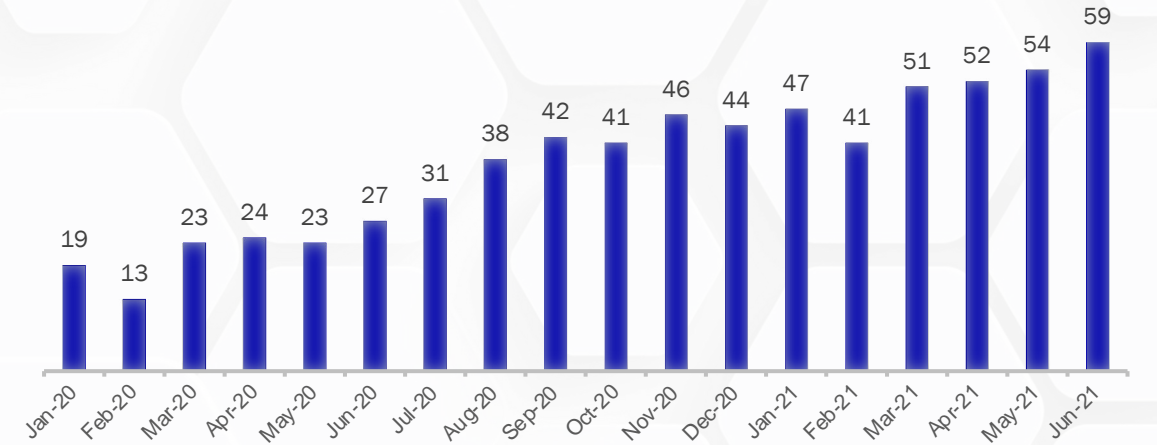
# EV sales and anode material volumes rebalancing the natural graphite market

Global EV Sales ('000 Units)



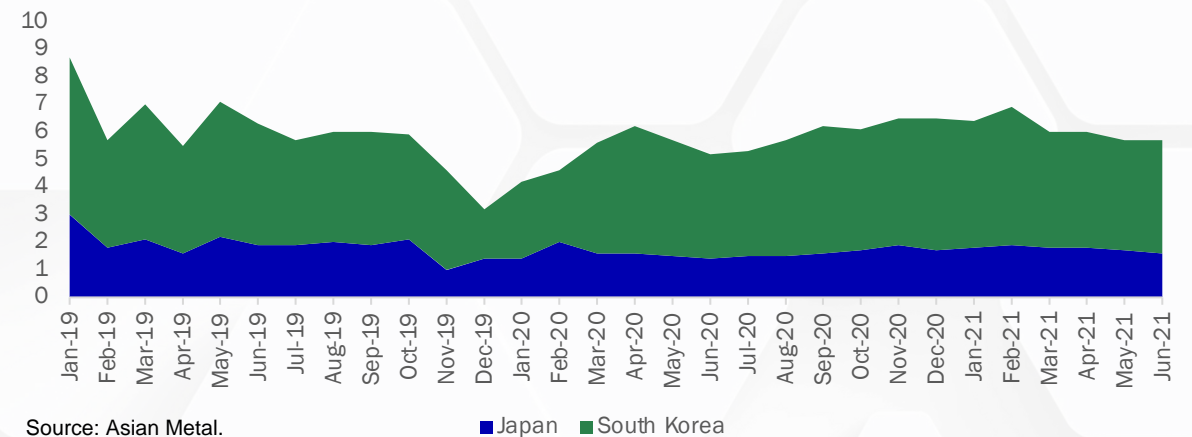
Source: Actual EV sales up to and including May 2021 from MarkLines. June 2021 EV sales based on actual EV sales for key countries (including China, USA, Germany, Norway and Sweden) from MarkLines and Syrah estimate for EV sales in the rest of the world.

Chinese Anode Production (kt)



Source: ICCSino

Chinese Purified Spherical Graphite Exports (kt)

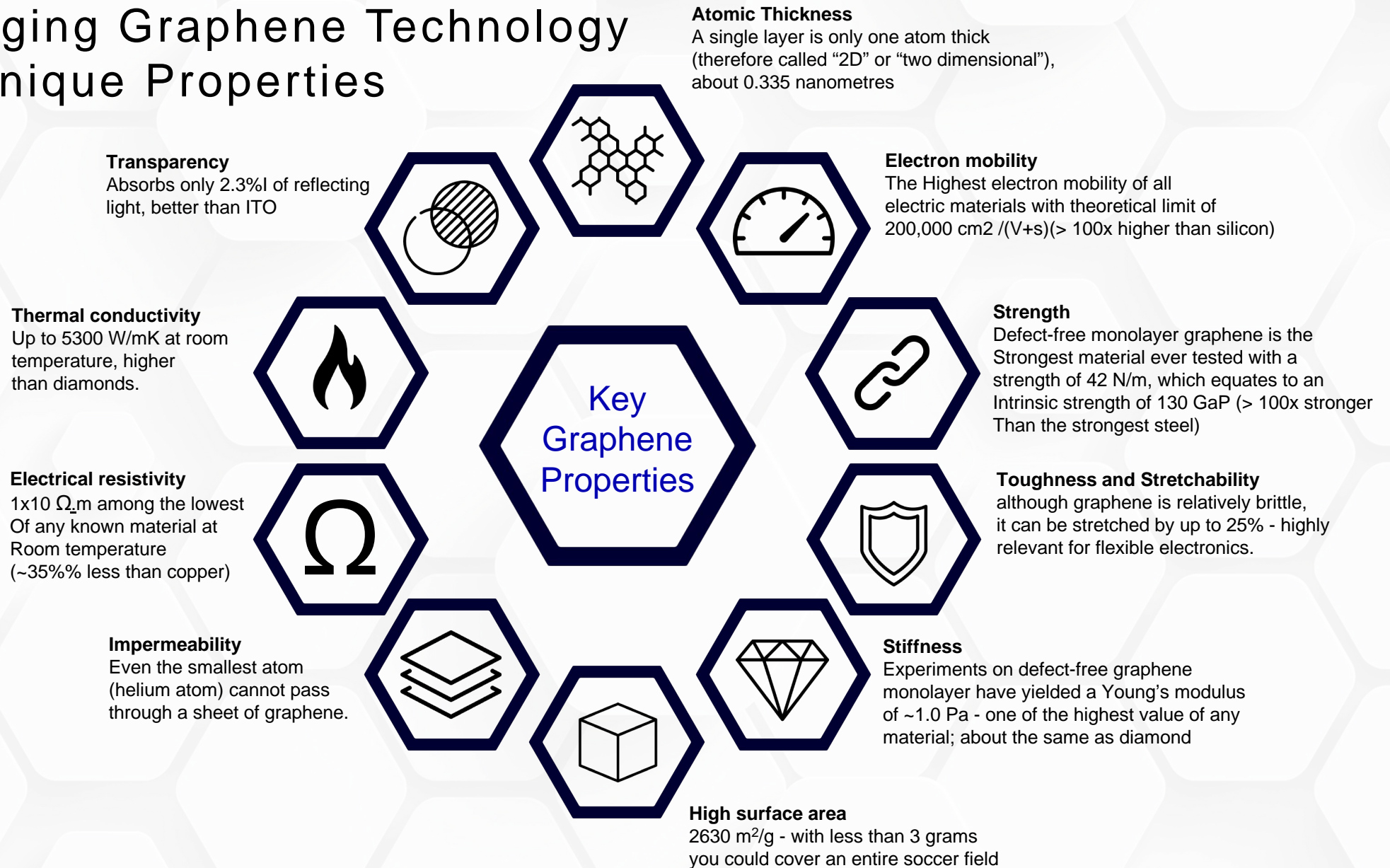


Source: Asian Metal.

■ Japan ■ South Korea



# Our Emerging Graphene Technology With its unique Properties



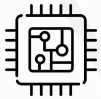
# Potential Graphene Applications



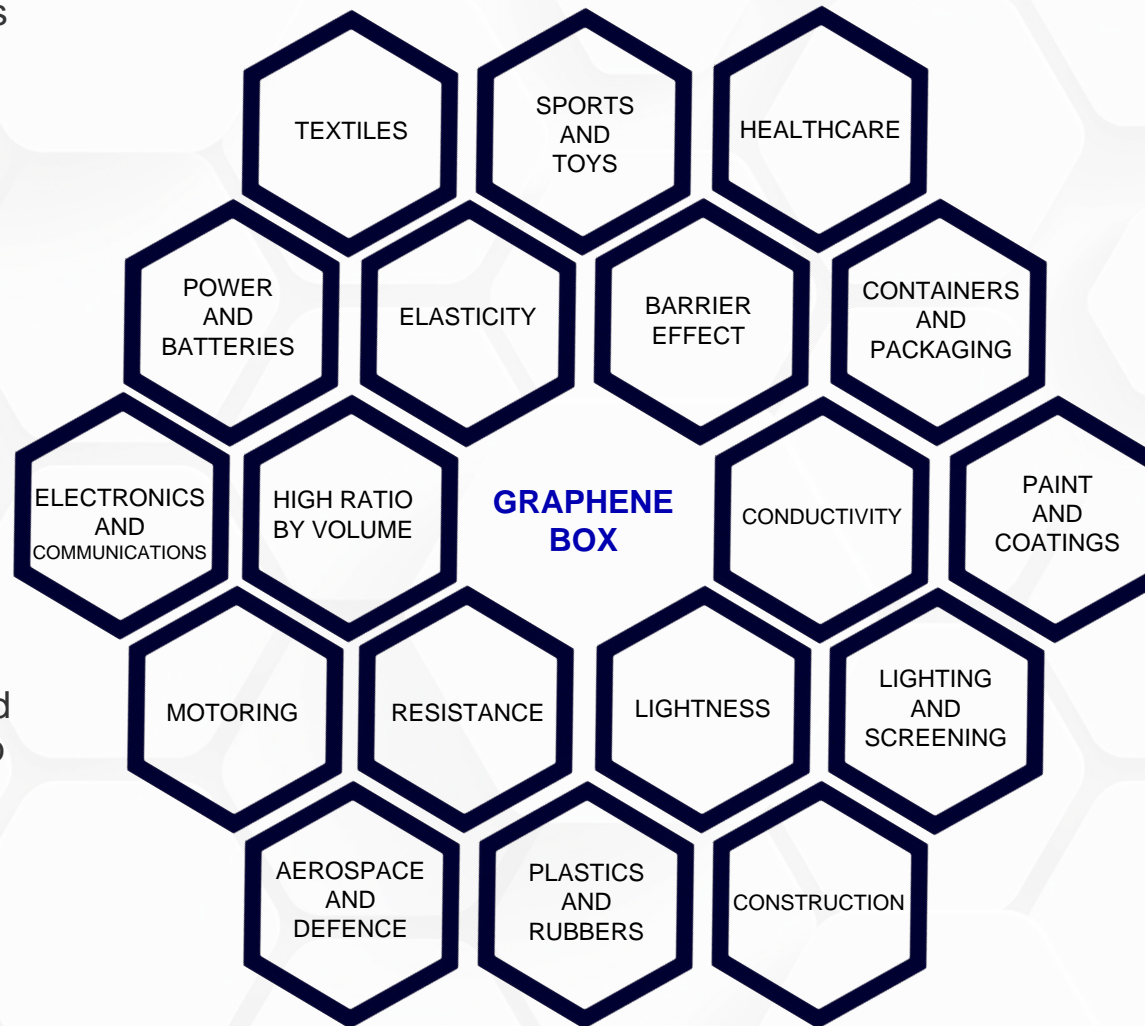
Graphene's unique properties allow for ground-breaking biomedical applications. Targeted drug delivery; improved brain penetration; DIY health-testing kits and 'smart' implants.



Graphene-based composite that will hopefully serve as a rust-proofing alternative to the toxic coatings



Graphene can be used as a coating to improve current touch screens for phones and tablets. It can also be used to make the circuitry for our computers, making them incredibly fast



Graphene supercapacitors could provide massive amounts of power while using much less energy than conventional devices. Because they are light, they could also reduce the weight of cars or planes.



Graphene oxide membranes are capable of forming a perfect barrier when dealing with liquids and gasses.



Graphene detects. Ultra-sensitive sensors made from graphene could detect minute dangerous particles helping to protect potentially dangerous environments.





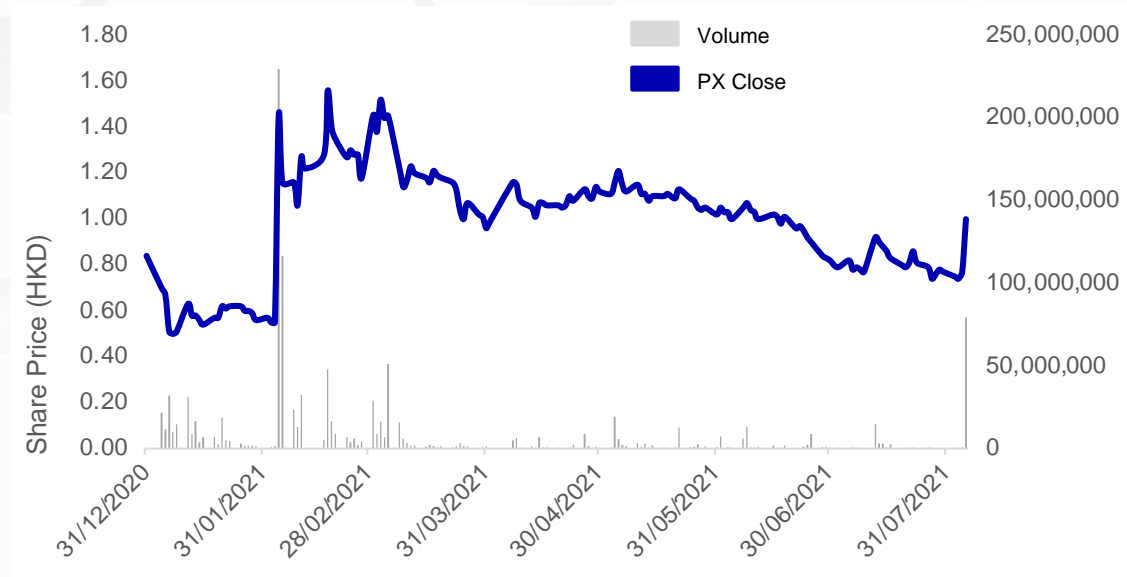
# Earthasia Design Group: our Eco Design division

- Develops urban landscapes, natural ecologies and public/private communities
- Using technology and unique experience in renewable energy concepts, we have designed and are beginning to build the world's first recharge parks
- Recharge parks use intangible features such as nature, peace & beauty and fuses them with clean energy electrical charging solutions





# Equity Capital Structure:



## STOCKMARKET CODES/TICKERS

OTCQX: GRFX

HKSE: 6128

Current Share Price (HKSE: 6128)	HK\$1.00
Fully Diluted Market Capitalization	HK\$608,732,302
	US\$ 78,243,227

As at August 5th, 2021; USD/HKD 7.77

Common shares:	482,251,538
Share options (at HK\$0.65):	40,000,000
Convertible Notes:	80,480,764
Fully Diluted:	608,732,302

As at Monthly Return of Equity Issuer: August 3rd, 2021

# Contact Details

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For news/financial information:

[www.graphexgroup.com](http://www.graphexgroup.com)

+852 2559 9438

[info@graphexgroup.com](mailto:info@graphexgroup.com)

[Daniel.nye@graphexgroup.com](mailto:Daniel.nye@graphexgroup.com)

11/F COFCO Tower  
262 Gloucester Road  
Causeway Bay, Hong Kong

