



helping make better batteries

COMPANY PRESENTATION

8th Annual Australian Microcaps Investment Conference

Melbourne – 18 October 2017

...improving electric vehicles, renewable energy storage, phones, laptops and cordless equipment

AGENDA



- About NOVONIX Limited
- Executive Team and Board
- Market Update
- NOVONIX Battery Testing Services (BTS) update
- PUREgraphite update



NOVONIX



ABOUT NOVONIX (ASX: NVX)

- **Established Brand in Lithium-ion Battery Industry**

NOVONIX Limited (ASX: NVX) is a developer and supplier of high performance materials, equipment and services for the global lithium-ion battery industry and has sales in over a dozen countries

- **Bluechip Customers – Battery Testing Technology**

NOVONIX Battery Testing Services Inc., is headquartered in Canada and develops and sells the most accurate battery cell test equipment in the world now used by leading battery makers and researchers and equipment manufacturers including PANASONIC, CATL, BOSCH, Dyson, 3M, Alcatel-Lucent, DALHOUSIE University, Pacific Northwest National Laboratory, Helmholtz Institute and many others

- **Proprietary Battery Materials**

NOVONIX, via our PUREgraphite joint venture with Coulometrics, develops and is establishing production of ultra-high purity high performance battery anode materials in the USA. PUREgraphite anode materials are aimed at meeting the most demanding lithium-ion battery applications which include electric vehicles, renewable energy storage, grid energy storage, military, aerospace, aviation and medical

- **Vertical Integration Security**

NOVONIX owns a high grade, long-life natural graphite deposit in Queensland, Australia

NOVONIX

END-TO-END DEVELOPMENT CAPABILITY



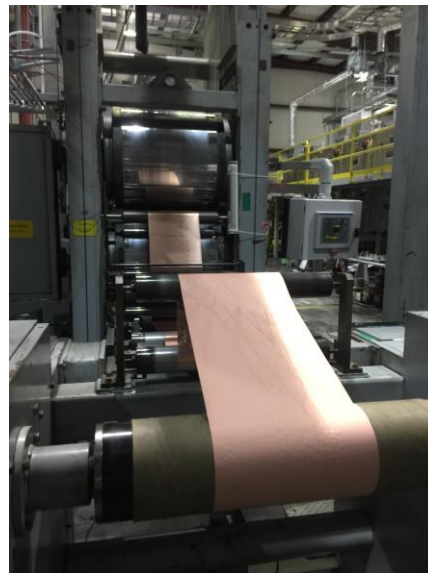
CHEMISTRY



MATERIALS



SLURRY MAKING



ELECTRODE MAKING



CELL & PACK MAKING



ELECTRONICS



EQUIPMENT

BATTERY CHEMISTRY AND MATERIALS TO BATTERY CELL TESTING SYSTEMS

two operating businesses in North America



Battery Testing Services Inc.

- LEADING BATTERY TESTING EQUIPMENT AND SERVICES COMPANY BASED IN CANADA WITH SALES IN 12 COUNTRIES
- ESTABLISHED IN 2013
www.novonix.ca



- USA BASED DEVELOPER OF HIGH PERFORMANCE GRAPHITE ANODE MATERIAL FOR THE LITHIUM ION BATTERY MARKET
- ESTABLISHED IN 2017
www.puregraphite.com



Customer locations for our battery testing equipment and services



NOVONIX

Battery testing equipment and services customers

dyson

Panasonic

CATL
solid power inside
宁德时代 量子电池

3M

BOSCH

DALHOUSIE
UNIVERSITY

XALT Energy

ATL

epsilor
AROTECH

24m

amprius

Alcatel-Lucent

HIM
Helmholtz-Institut Mainz

K2 ENERGY

Pacific
Northwest
NATIONAL
LABORATORY



For confidentiality reasons there are a number of major global automakers, battery makers, medical device and electronics companies that are customers but cannot be represented.

Executive Team

Managing Director

Philip St Baker



Executive Director

Greg Baynton



CEO PUREgraphite

Dr Edward Buiel



CEO NOVONIX BTS

Dr Chris Burns



CTO NOVONIX BTS

Dr David Stevens



VP Business Development

Nick Liveris



Mt Dromedary GM

Steve Hadwen



CFO NOVONIX Group

Suzanne Yeates



Board of Directors

Chairman

Tony Bellas



Managing Director

Philip St Baker



Executive Director

Greg Baynton



Non-Executive Director

Admiral Robert J. Natter



Non-Executive Director (Future Appointment)

Andrew N. Liveris AO

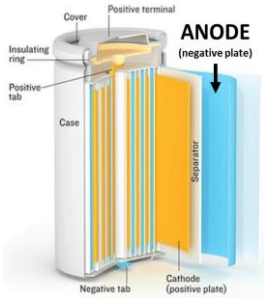


Non-Executive Director

Robert Cooper



HOW MUCH ANODE MATERIAL IS INSIDE ?



CYLINDRICAL BATTERY CELLS

APPLICATIONS



~ 10kg ~ US \$100
(~20% of battery cell weight)

~1,000 cells
(18650 size)

HOME STORAGE
13.5 kWh
(Ave home use 20 kWh/day)



~ 70kg ~ US \$700

~7,000 cells
(18650 size)

ELECTRIC VEHICLE
80 kWh
(400km+ full charge range)



~ 90t ~ US \$900,000

~9,000,000 cells
(18650 size)

GRID STORAGE
130 mWh
(size announced for SA)



Note: Indicative and illustrative information with approximations applied


Rapid growth in production of lithium-ion batteries

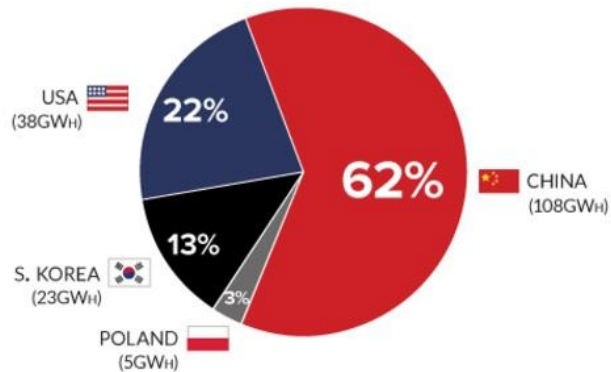
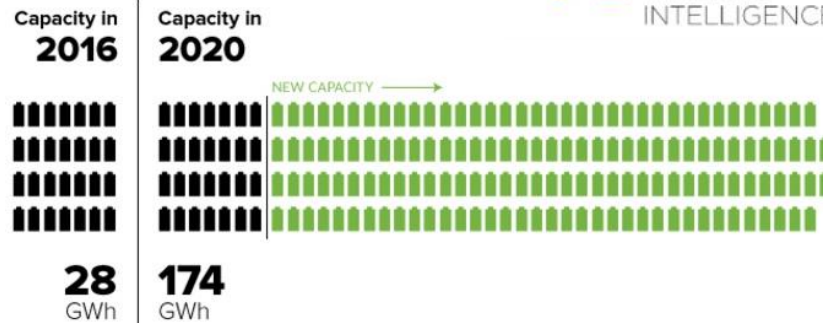
6X growth in Lithium-ion megafactories by 2020 – Source: BENCHMARK

CHINA IS LEADING THE CHARGE

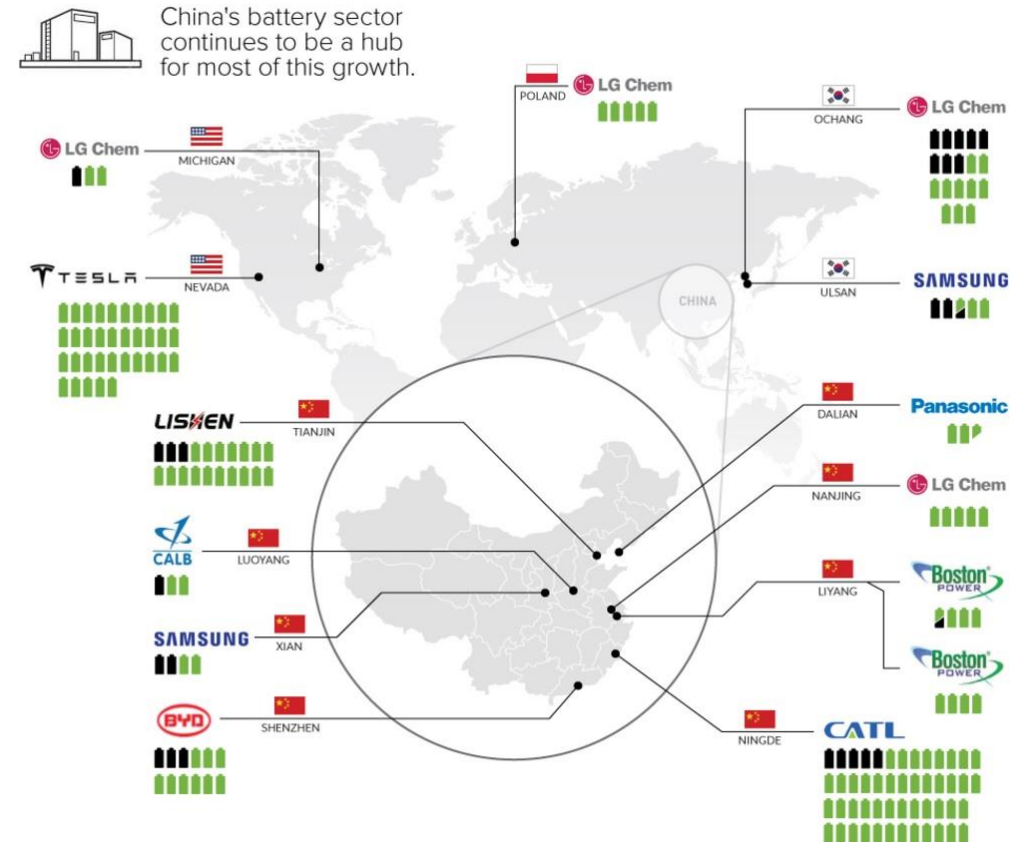
Lithium-ion megafactories in China to grow capacity 6X by 2020

Data by:
BENCHMARK
MINERAL
INTELLIGENCE


Global lithium-ion battery production capacity will increase by **521%** between 2016 and 2020.



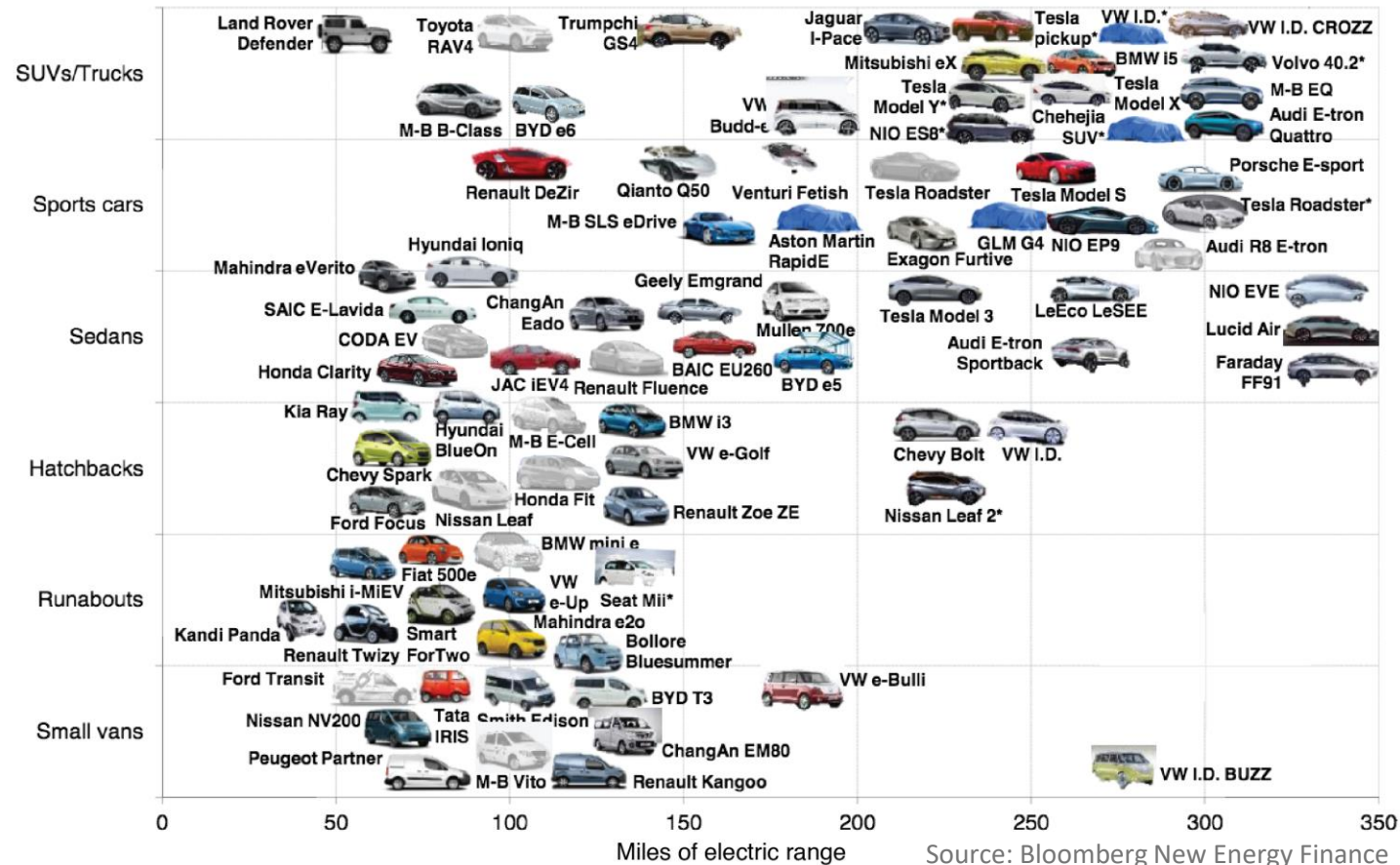
By 2020, mass production of lithium-ion batteries will still be concentrated in just **four** countries.



Most major auto companies now offering EV models'

Electric-Car Boom

Models by style and range available through 2020





Volkswagen



Rapidly developing markets

Major EV announcements from global auto makers

- 2 October – GM announces two more EV models within 18 months and 20 more globally within six years
- 15 September - Volkswagen announces plans to invest more than EUR50 billion (\$60bn) in battery cells and related technology, towards the electrification of its entire model portfolio by 2030 “at the latest”
- 7 July - TESLA announce it will build the world’s largest grid battery which will be 129MWh in SA
- 5 July - Volvo announced that from 2019 all new Volvo cars will have electric or hybrid engines
- 28 April - Volkswagen announced plans to build 2-3 million EV’s pa by 2025 and 30 different EV models

Major EV related announcements from Governments

- 9 September - China flags a long-term plan to phase out vehicles powered by fossil fuels
- 6 July - France announced that France will end sales of petrol and diesel vehicles by 2040
- China, UK, France and India all signalled plans to ban/limit sales of vehicles powered with gasoline or diesel fuels in coming decades and California’s Air Resources Board considering similar moves

Graphite supply instability

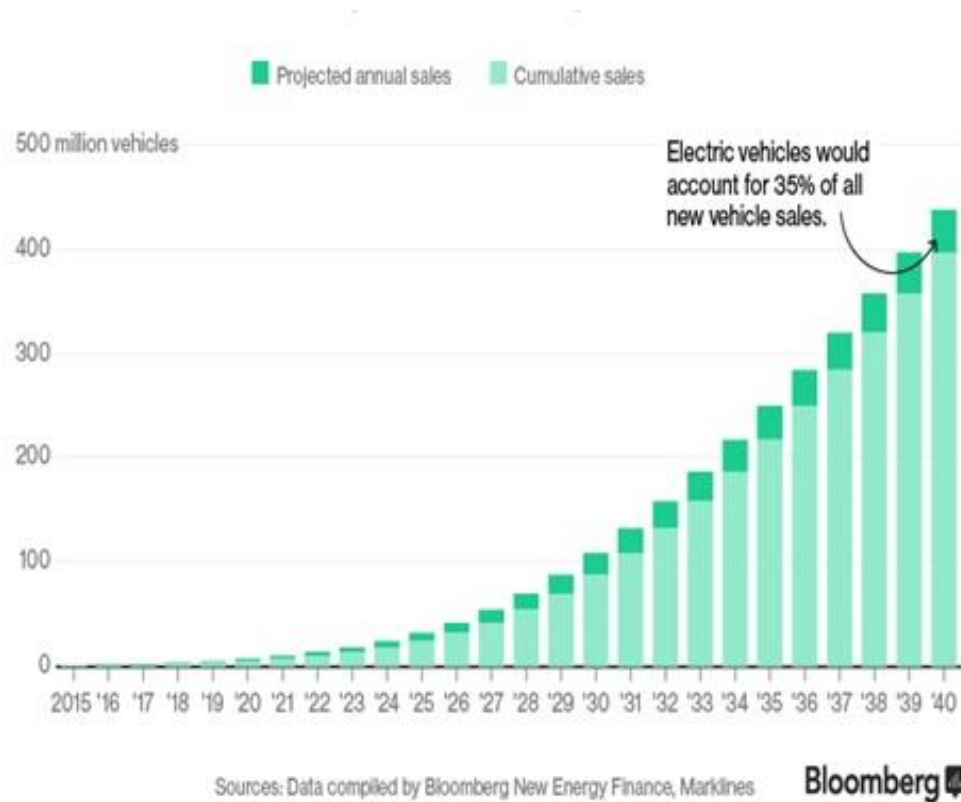
- Graphite supply situation currently unstable with the China Environmental Office taking action and controlling graphite chemical purification which is impacting production, graphite supply and pricing

The Rise of Electric Cars – Source: Bloomberg New Energy Finance

By 2022 electric vehicles will cost the same as their internal combustion counterparts.

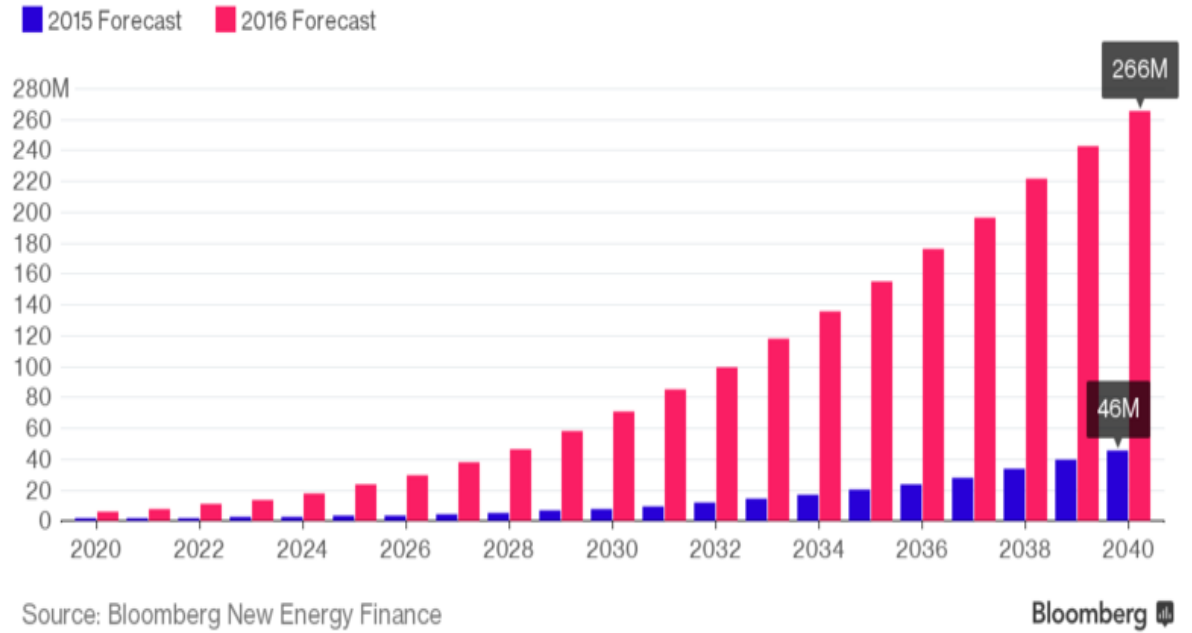
That's the point of liftoff for sales.

(Note: Current annual total global vehicle sales is approximately 100 million vehicles)



Growing Expectations

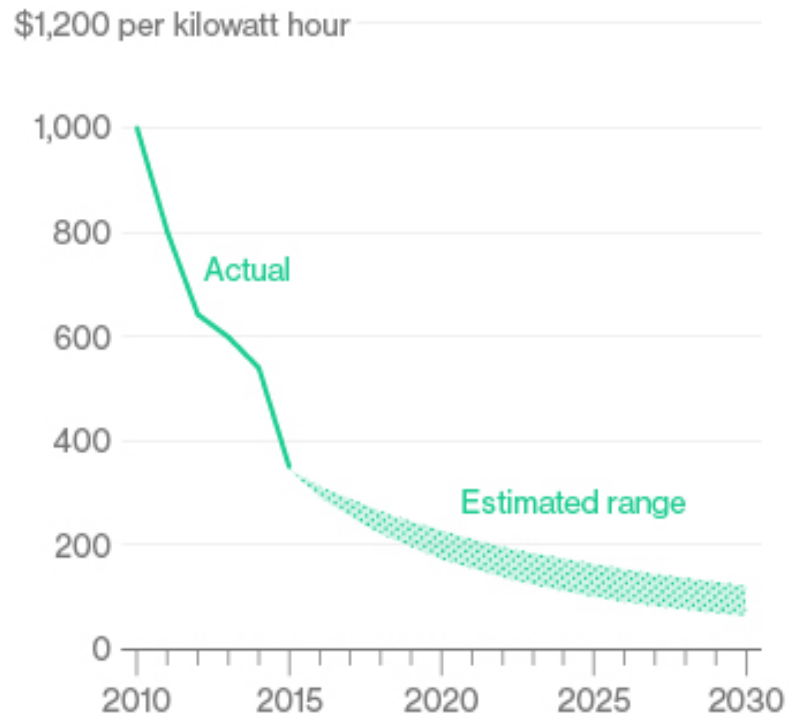
OPEC's electric vehicle forecast grew by almost 500% last year



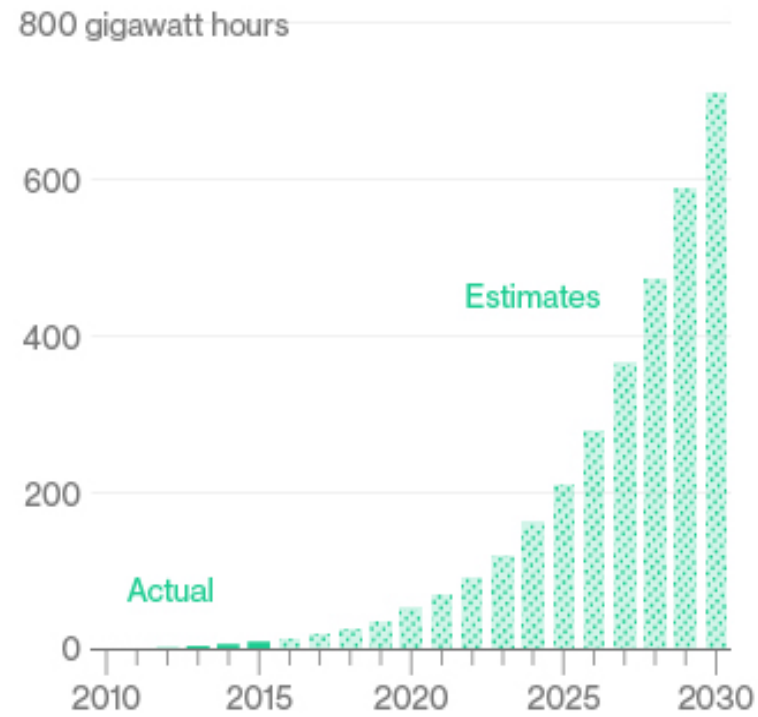
It's All About the Batteries

Batteries make up a third of the cost of an electric vehicle.
As battery costs continue to fall, demand for EVs will rise.

Cost for lithium-ion battery packs



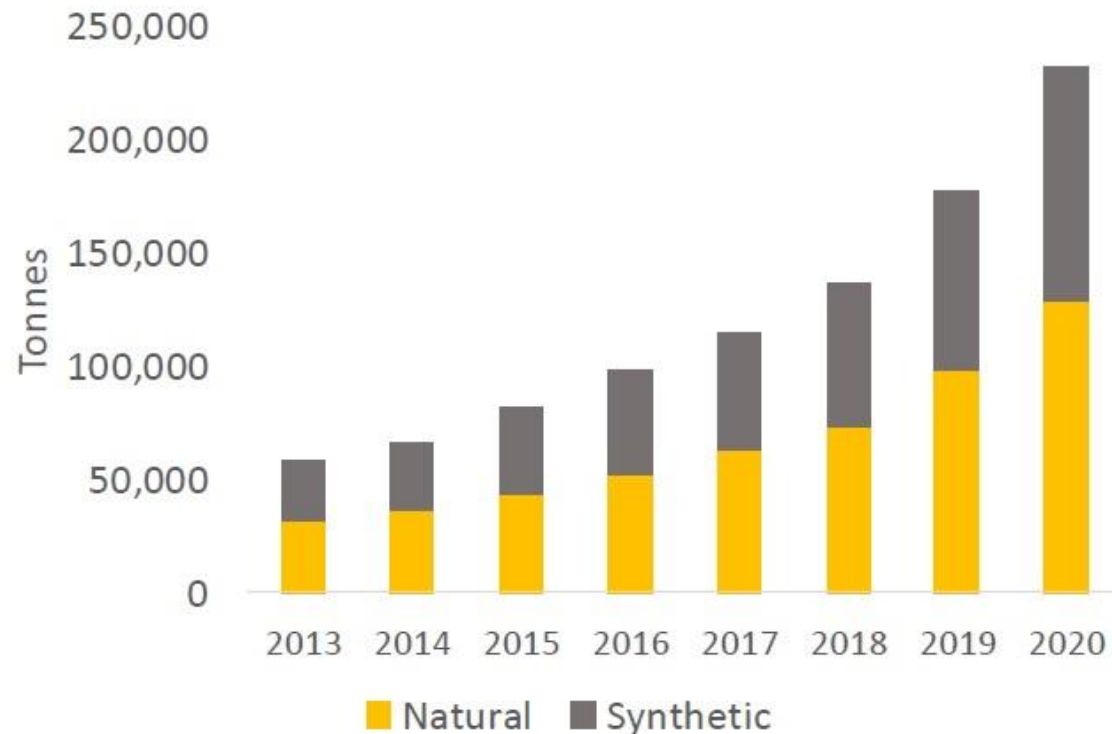
Yearly demand for EV battery power



Source: Data compiled by Bloomberg New Energy Finance



Anode market forecast

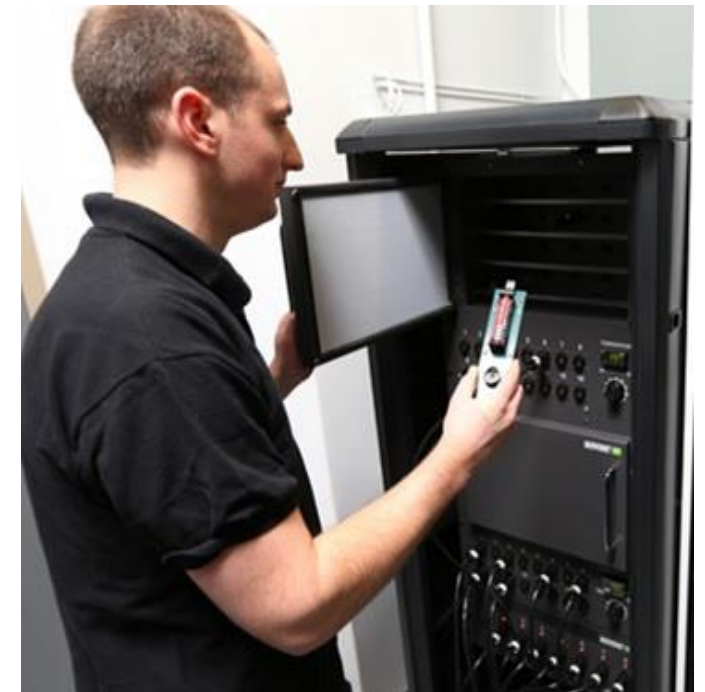


- Natural vs Synthetic debate key
- Blended anodes becoming increasingly important as producers push towards higher energy density chemistries
- Cost and performance advantages mean natural will be the preferred option for EVs, if the industry can supply consistent volumes
- Flake graphite producers investing heavily in value-added processing to meet this demand



Battery Testing Services Inc.

- NOVONIX Battery Testing Services Inc (BTS) is based in Canada and was spun out of Dr Jeff Dahn's lab at Dalhousie University (DAL) in 2013
- NOVONIX BTS manufactures the most accurate battery cell test equipment in the world used by leading battery makers, manufacturers and researchers with sales in 12 countries
- Our equipment allows researchers to predict battery cell life and performance within weeks of testing rather than years



Dr Chris Burns - CEO

NOVONIX Battery Testing Technology is supported by:



Government
of Canada

Gouvernement
du Canada



Atlantic Canada
Opportunities
Agency

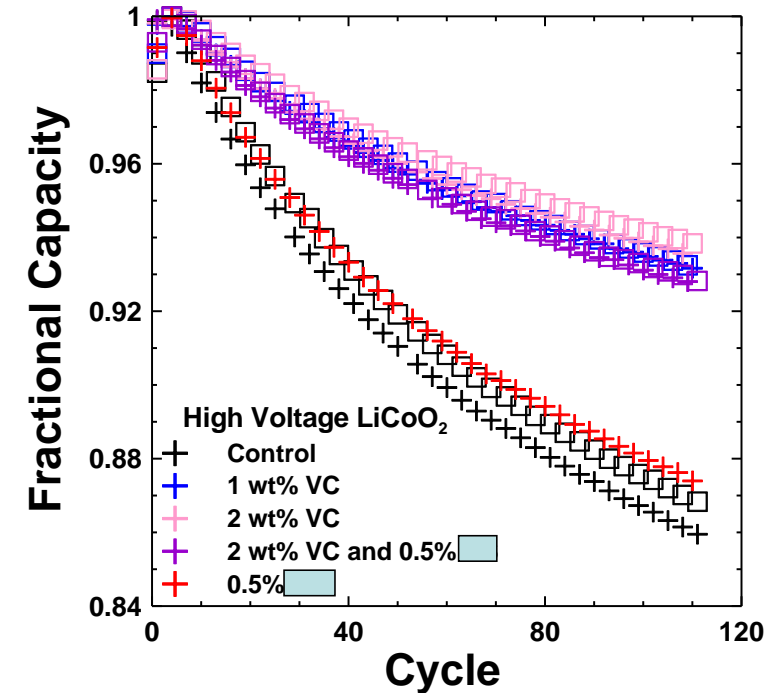
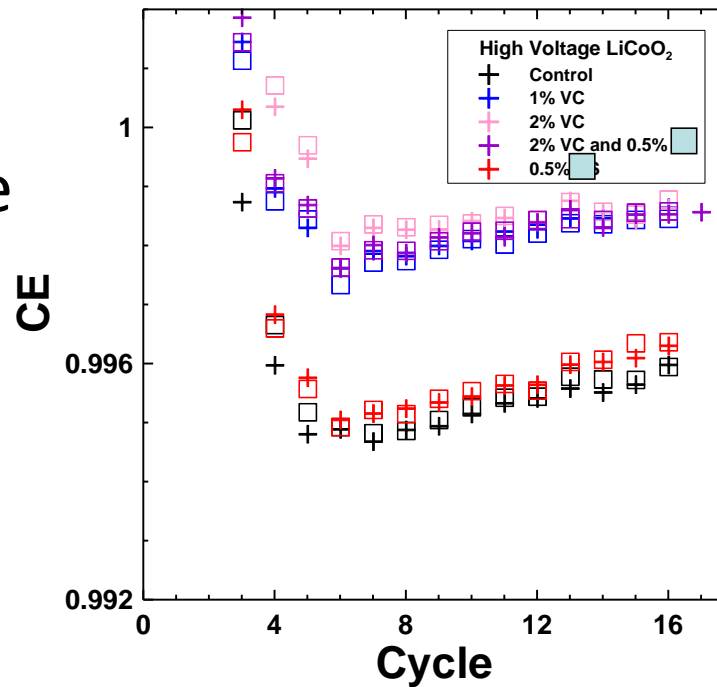
Agence de
promotion économique
du Canada atlantique



Battery Testing Services Inc.

Precise measurements of the coulombic efficiency (CE) can predict the lifetime of cells with different failure modes including those that show almost no capacity loss until failure

Reference: Burns *et al.* J. Electrochem. Soc., **160**, A1451 (2013).





Battery Testing Services Inc.

Progress and priorities

- Strong sales flow from existing customers now wanting to expand their NOVONIX systems
- Consistent flow of new customers including some very big global brand names
- Expanding manufacturing to meet increasing demand for our HPC testing technology
- Launching and marketing higher power HPC systems for more advanced HPC testing
- Launching and marketing a lower cost range of testing equipment for smaller research organisations
- Prototyping and patenting new breakthrough battery testing technologies
- Expanding the testing services side of the business
- Tooling up to start early stage development work on electrolytes



- USA based Joint venture between NOVONIX and Coulometrics est in 2017
- Focused on production of graphite anode materials for lithium-ion batteries promoting:
 - Lower Cost
 - Longer Life
 - Higher Charge Rate
 - Sustainability
 - Security
 - Safety



Dr Ed Buiel - CEO



Intellectual Property

- PUREgraphite is commercialising intellectual property and trade secrets developed by Coulometrics and its founder Dr Edward Buie over more than two decades and including the development of proprietary particle coating technology and spherical graphite processing

Coulometrics graphite anode research has been supported by:



National Science Foundation
WHERE DISCOVERIES BEGIN

National Science Foundation Grant No. 1315040
(CVD Process for Coating Graphite)

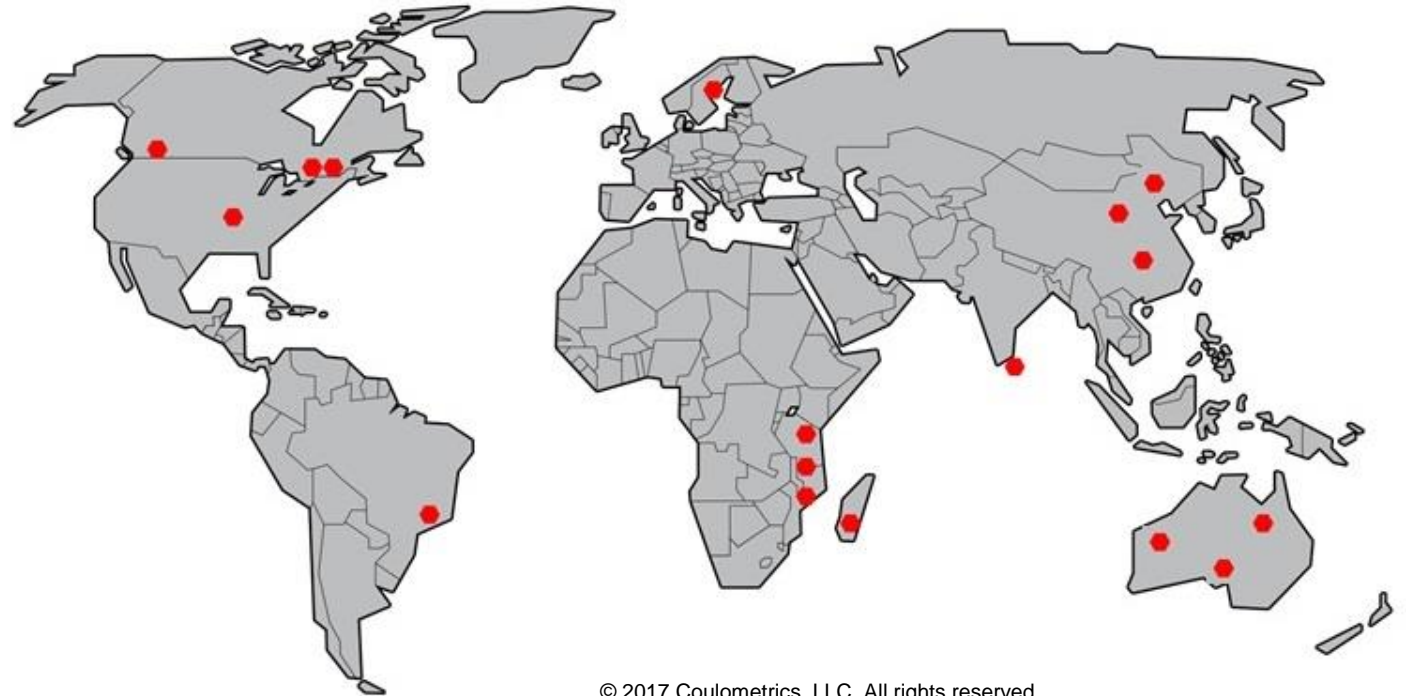


US Department of Energy Grant No. DE-SC0015953 (High yield spheronization)

We have world wide experience in electrochemical testing of natural and artificial graphite sources for suitability in lithium-ion batteries

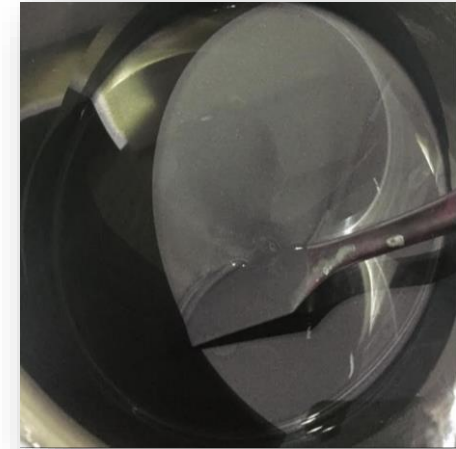
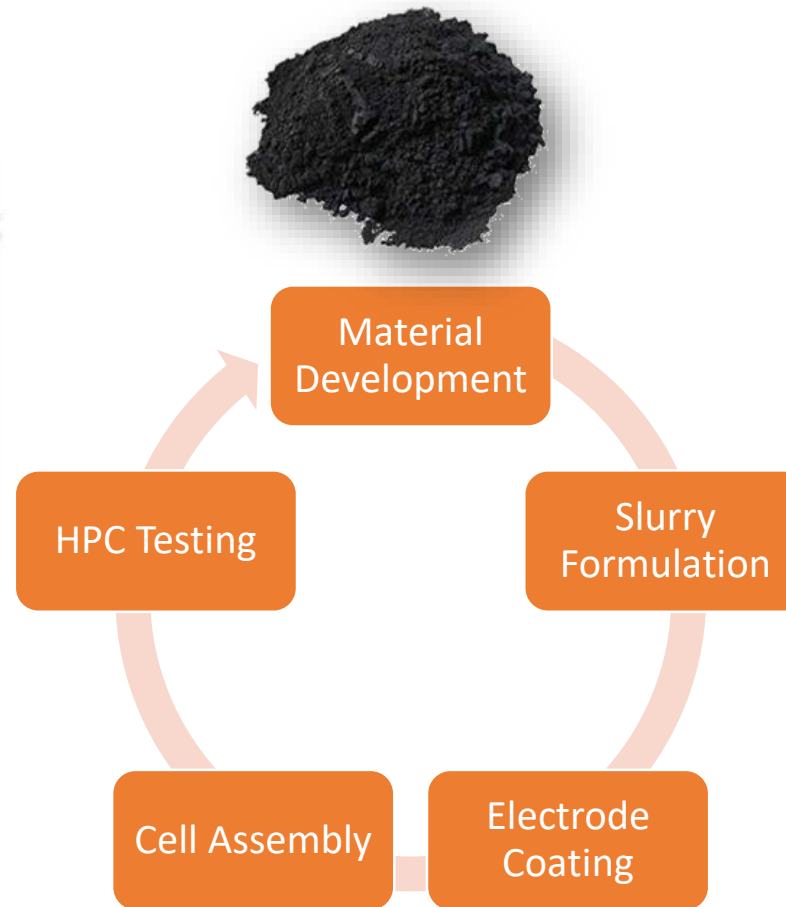
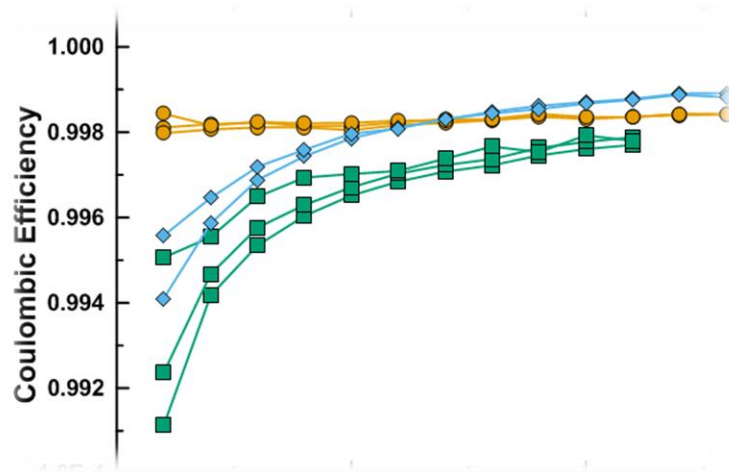
- We are well advanced in selecting our preferred supply for our proprietary product and manufacturing processes
- From a strategic perspective PUREgraphite will continue to develop and test product based on the NOVONIX Mount Dromedary graphite resource in Australia such that this can be leveraged at the right time in the future

In-house Knowledge of Artificial and Natural Graphite Sources



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We have a rapid battery materials R&D process



We have commercial grade battery making facilities

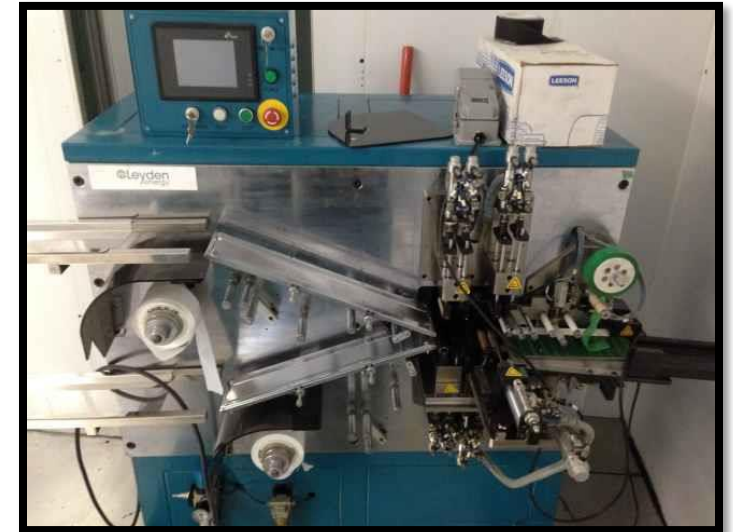
Production Scale Coating



Electrode Roll Pressing



Cell Winding



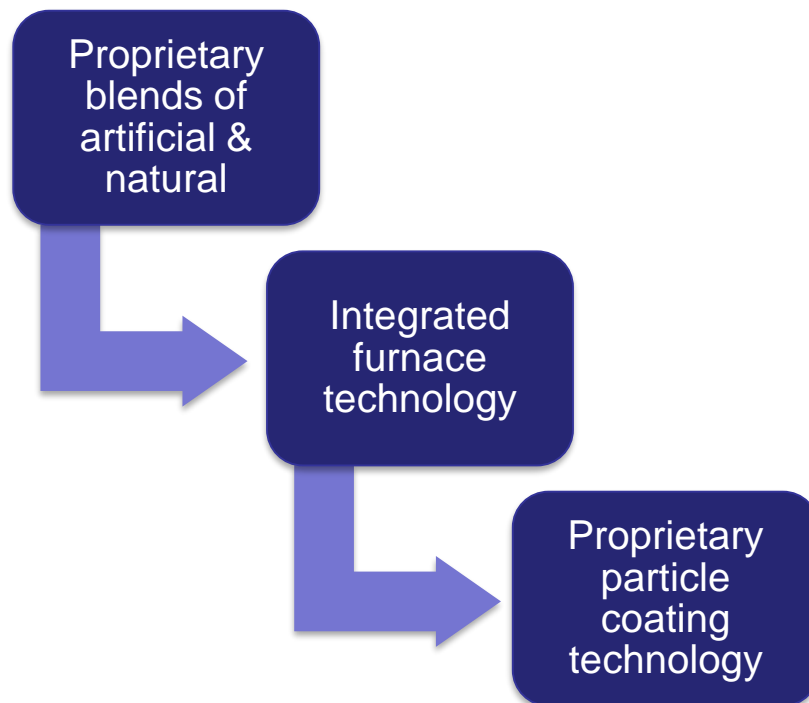


Our battery anode materials can deliver superior performance

- PUREgraphite can customize anode materials to deliver optimal performance for specific customer applications including Electric Vehicles, Energy Storage, Aerospace, Aviation, Military, Medical and electronics
- We can optimize battery power, energy and life and ensure safety is not compromised
- We can make anode materials and full cell batteries using our anode materials that have coulombic efficiencies better than battery cells used in leading EV's on the road today
- We forecast these better coulombic efficiencies to translate to substantial increases in battery life (30%+) over best in class today, critical for the EV and Energy Storage battery markets



Our product designs and production methods are expected to deliver lower cost and lower emissions



- Proprietary blends of artificial and natural graphite specific to customer applications
- Integrated high efficiency, high throughput and high consistency integrated furnace technology
- Proprietary PUREgraphite particle coating technology
- Low cost and low emission electricity sources
- High purity artificial and natural graphite sources
- No chemical purification using HCL/HF



Short Term Milestones / Goals

- On track to have a pilot production plant installed, commissioned and producing small quantities before Christmas including jet mill, shaping mill, furnace and coating equipment
- Good progress toward establishing a 1,000 tpa production capability by 30 June 2018 comprising combination of internal production and some outsourced operations
- Good progress in assessing options, developing plans, assessing sites and service providers to rapidly scale the business up to 100 ktpa

Customers

- We are actively engaged with US domestic battery makers focused on speciality applications and a number of major global battery and auto makers looking at long term supply needs for larger EV and ES markets





Capital Structure:

	Number (m)	% (fully diluted)
Board and key management personnel – ordinary shares	46.111	34.85%
Board and key management personnel – options and rights	14.562	11.01%
Employee and contractor options	0.975	0.74%
Remaining loan notes @ face value AUD 0.6/share (assuming all convert)	7.740	5.85%
Other shareholders – ordinary shares	62.925	47.55%
	132.313	100%

NOVONIX



CORPORATE

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BATTERY EQUIPMENT & TECHNOLOGY

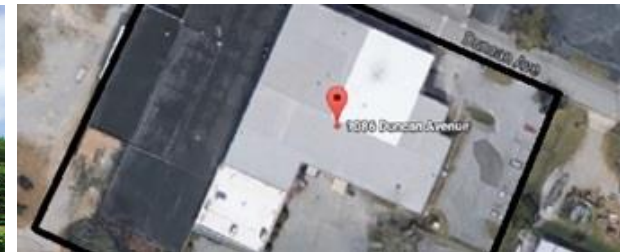
Dartmouth, Nova Scotia, CANADA

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Telephone: +1 902-449-9121



BATTERY MANUFACTURING FACILITY

Chattanooga, Tennessee, USA

Contact: Dr Edward Buie

Email: ed@puregraphite.com

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Telephone: +1 423-954-7766