

NOVONIX Limited
(ASX: NVX)

Initiating Coverage

August 2017

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Investment Profile

Share price (\$) as at 24 August 2017	1.18
Issued capital:	
Ordinary shares (M)	103.5
Options (M)	14.0
Performance Rights (M)	1.6
Loan Notes (M)	13.6
Fully Diluted (M)	132.4
Market capitalisation (\$M)	122.1
12-month Low/High (\$)	0.47/1.35

Board and Management

Tony Bellas: Non-Executive Chairman
Philip St Baker: Managing Director
Greg Baynton: Executive Director
Robert Cooper: Non-Executive Director
Admiral Robert Natter: Non-Executive Director
Suzanne Yeates: CFO/Company Secretary
Dr. Edward Buiel: CEO PUREgraphite
Dr. Chirs Burns: CEO NOVONIX
Dr. David Stevens: CTO NOVONIX
Steve Hadwen: Mount Dromedary Project Director

Major Shareholders

	%
Gregory Baynton	29.5
Philip St Baker	16.1
Washington H. Soul Pattinson and Company Limited	16.0
Anthony Bellas	3.9

Share Price



POISED TO SUPPLY ANODE MATERIAL TO THE GLOBAL LIB MARKET

NOVONIX Limited (ASX: NVX), previously GraphiteCorp Limited (ASX: GRA), has transformed from a developer of a flake graphite deposit into a supplier of advanced battery materials, equipment and services to the global Lithium Ion Battery (LIB) market. Recent acquisitions and developments has resulted in the company breaking into the supply chain of the LIB market with the potential to operate in both the upstream and downstream aspects of the value chain.

KEY POINTS

Completion of NOVONIX Acquisition: In June 2017, the company announced the completion of the remaining one-third interest in NOVONIX Battery Testing Services Inc. (NOVONIX), after acquiring two-thirds of the shares on issue in March 2017. The company acquired the shares in NVX for a total of CAD\$4.9m. Following the acquisition, the name of company was changed from GraphiteCorp Limited (ASX:GRA) to NOVONIX Limited (ASX: NVX) to reflect the new direction of the business. NOVONIX designs, manufactures and supplies high precision Lithium Ion Battery (LIB) testing equipment and services, developing and manufacturing the worlds most accurate high precision battery testing equipment. The company supplies it's products and services to a number of high profile customers including PANASONIC, TESLA, CATL, Apple, 3M, BOSCH and Dyson. The acquisition of NOVONIX provides a significant competitive advantage to the product development of the PUREgraphite business.

PUREgraphite JV: In March 2017, the company announced the establishment of PUREgraphite, a 50:50 joint venture between the company and Coulometrics. PUREgraphite will seek to manufacture high purity anode materials for LIBs, with a long-term focus on the growing electric vehicle and energy storage markets. PUREgraphite is seeking to build and commission its initial manufacturing facility targeting 1,000tpa and commence commercial production by 30 June 2018. The business will be targeting the military and other specialist applications for the offtake of the initial production. In conjunction with establishing the initial production facility, PUREgraphite is developing options to scale up operations to allow for production of up to 100,000tpa. The company is seeking to have the plans for the expanded operations in place by the end of FY18. The PUREgraphite business will be a focus for the company with the business being the primary growth driver for the company.

Mount Dromedary Flake Graphite Project: The Mount Dromedary Flake Graphite Project (the Project) is a world class graphite deposit located 125km north-northwest of Cloncurry in Queensland. The Project is still in the early stages of development with the company yet to complete a Feasibility Study. The development of the Project has become less critical given the NOVONIX acquisition and the establishment of the PUREgraphite business, and as such we expect the short-term focus of the company to be directed away from the Project. However, the Project remains a valuable asset and once developed could provide a secure long-term supply of graphite concentrate to the PUREgraphite business.

Capital Position: The company completed a convertible loan note placement during March and April raising \$15.5m for the acquisition of NOVONIX and for the contribution to the PUREgraphite JV. The company currently has around \$5.8m cash on hand. Given the PUREgraphite JV is yet to generate revenue and NOVONIX is only generating small amounts of revenue at this stage, we expect the company will be required to raise additional capital for the eventual scale up of the PUREgraphite business and to develop the Mount Dromedary Flake Graphite Project (in the event a development decision is made).

Investment Case: The recent transition to a supplier of advanced battery materials and equipment and services to the global LIB market has positioned the company to take advantage of the rapidly growing LIB market. The key growth driver for the company will be the PUREgraphite business, which could transform the company into a global player in the production of LIB anode material. The company however is a speculative investment, given the current low levels of revenue and the company is yet to commence production of anode material. Securing a supply contract for the initial production capacity and the commencement of production of anode material will be significant milestones for the company and will likely be a catalyst for a re-rating of the company.

SWOT ANALYSIS

Strengths

- ◆ The company successfully completed a \$15.5m convertible note placement in April 2017, to cover the cost of the contribution towards the PUREgraphite JV and the acquisition of the remaining one-third interest in NOVONIX.
- ◆ The company has retained key management personnel in the acquisition of NOVONIX and through the JV agreement with Coulometrics. Retaining this expertise is critical to the businesses.
- ◆ Through its strategic partnerships and acquisitions, the company has acquired working relationships with potential customers, including PANASONIC and CATL.
- ◆ PUREgraphite production facilities are currently located in Tennessee which is known for its low energy costs. Production of the anode materials is a high energy intensive process. Positioning the company's production facilities in low energy cost areas in conjunction with the product design and production process developed by Coulometrics and now being advanced by PUREgraphite is the reason the company can produce premium anode materials at a lower cost.
- ◆ Through the PUREgraphite JV agreements and NOVONIX, the company has the ability to assemble batteries to a very high standard and to test them using its own high precision testing technology, providing the company a significant advantage over its competitors. Having these abilities in-house significantly reduces testing times and enhances the R&D capabilities of the company.
- ◆ PUREgraphite CEO, Dr. Buiel, has developed a proprietary product and manufacturing process to produce high grade anode material. Initial testing has indicated that PUREgraphite's products can enhance a batteries life by up to 30% when compared to it's competitors.

Weaknesses

- ◆ The company is yet to secure any supply agreements for the initial production capacity of PUREgraphite anode material. While no supply agreements have been secured, the company is currently in discussions with producers of products in the military and other specialist applications for the offtake of product.
- ◆ 48% of the shares on issue are currently held in escrow. The release of the shares from escrow will likely have a dilutive impact on existing shareholdings. Further to this, the conversion of the \$15.5m loan notes which are due for conversion over the coming 12-months will have a further dilutive impact on existing shareholders as the convertible notes were issued to new shareholders.

Opportunities

- ◆ The LIB market is in a growth phase and is expected to experience annual growth in battery volume of 13% from 2016 to 2025. While consumer electronics will remain a significant user of LIBs, the goal to reduce carbon emissions and be environmentally sustainable is resulting in the increase in demand of electric vehicles and energy storage, areas in which the company is focusing.
- ◆ The PUREgraphite business is well placed to take advantage of the growing demand for high purity battery materials for the electric vehicle and energy storage markets. Supplying high purity anodes to this market is concentrated with two major suppliers globally and has high barriers to entry. Therefore the ability of the company to secure supply agreements to the producers of the LIBs for the electric vehicle market puts the company in a strong position for stable and likely growing demand.

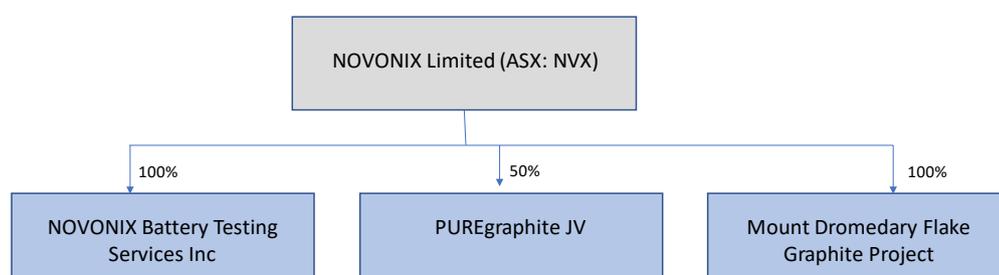
Threats

- ◆ The introduction of alternative materials to graphite in anodes that produce a superior battery life and performance will have a negative impact on the company across its businesses. We note companies such as PNNL are currently looking to develop the silicon anode which has the potential to double the capacity of graphite anode batteries.
- ◆ The company will likely have to raise additional capital to fund the expanded PUREgraphite facility which will be required to scale up production of battery materials. Depending on how this capital is raised it will likely have a dilutive impact on shareholders.

COMPANY OVERVIEW

- ◆ NOVONIX Limited (ASX: NVX), previously GraphiteCorp Limited (ASX: GRA), has transformed from a developer of a flake graphite deposit into a supplier of advanced battery materials, equipment and services to the global Lithium Ion Battery (LIB) market.
- ◆ At a Shareholder General Meeting on 10 July 2017, the company's proposal to change to its name to NOVONIX Limited was approved. The name change was a result of the recent acquisition of NOVONIX Battery Testing Services Inc and JV with Coulometrics (details below) which expands on the previous operations of the business.
- ◆ With the recent acquisition of 100% of NOVONIX and the PUREgraphite joint venture with Coulometrics, the company now has operations in the downstream production for LIBs.
- ◆ As a result of the new business ventures, the progress of the Mount Dromedary Flake Graphite Project is less critical for the company than previously. The company will be focusing on the new business ventures, in particular the development of the PUREgraphite business.
- ◆ While the Mount Dromedary Flake Graphite Project is less critical it remains a valuable asset for the company given the expected increase in high grade flake graphite requirements to satisfy the growing LIB market and the desire for countries to reduce their reliance on China, which currently supplies a large majority of the market.

Company Structure



NOVONIX Acquisition

- ◆ In March 2017, the company announced the acquisition of two-thirds of NOVONIX Battery Testing Services Inc (NOVONIX), a leading battery testing equipment and services company based in Canada.
- ◆ NVX paid CAD\$3.3m for the two-thirds interest, which included CAD\$2m cash and 3.4m NVX shares which are subject to escrow for a 12-month period following completion of the transaction.
- ◆ In June 2017, the company announced the completion of the remaining of one-third of NOVONIX to own 100% of shares on issue. The company acquired the remaining interest for CAD\$1.6m in cash. This takes the total compensation for the acquisition of NOVONIX to CAD\$4.9m.

PUREgraphite JV

- ◆ The company has established PUREgraphite, a joint venture (JV) with Coulometrics, a US based developer of graphite anode material for LIBs.
- ◆ As part of the JV, NVX contributed USD\$5m to the JV to acquire the graphite anode material intellectual property and further graphite anode development from Coulometrics and will contribute a further USD\$5m over the 12-months post the establishment of the JV to cover capital and operating costs. Coulometrics will contribute various plant, equipment and services.
- ◆ The company has the option to increase its interest from 50% to 75% by February 2019. The company has not disclosed the price attached to the option.

FINANCIAL POSITION

- ◆ At 30 June 2017, the company had \$5.8m cash on hand. The cash reserves have been boosted from the \$15.5m raising from a convertible loan note placement. The capital raised was primarily used for the contribution to the PUREgraphite JV and acquisition of the remaining third of NOVONIX.
- ◆ The convertible loans were issued in two tranches on 7 March and 10 April. The notes were issued at \$0.60 per note with a coupon on 10% p.a for a 13- month term. The notes are convertible into NVX shares on a 1 for 1 basis. We note that the \$0.60 per note was issued at a discount to the share price at the time.

NOVONIX BATTERY TESTING SERVICES INC

- ◆ The company completed the strategic acquisition of the remaining third of NOVONIX Battery Testing Services Inc (NOVONIX) shares in June 2017.
- ◆ NOVONIX was established in 2013 and is headquartered in Dartmouth, Canada. NOVONIX designs, manufactures and supplies high precision LIB testing equipment and services, developing and manufacturing the worlds most accurate high precision battery testing equipment.
- ◆ NOVONIX was established to develop battery testing systems specifically catered to precision measurements of coulombic efficiency. **Coulombic Efficiency** refers to the ratio of the output of charge by a battery to the input of charge.
- ◆ Precise measurements of the coulombic efficiency of a cell has been shown to have significant benefits to the R&D of battery projects as it allows researchers the ability to accurately predict the battery cell life. It can also be used to evaluate the impact of changes to battery design on the long-term performance of the battery.
- ◆ NOVONIX supplies it's products and services to a number of high profile customers including PANASONIC, TESLA, CATL, Apple, 3M, BOSCH and Dyson. Since its establishment NOVONIX has supplied more than 1,000 of its High Precision Coulometry units across 12 countries.
- ◆ The NOVONIX business is cashflow positive and no additional capital is expected to be required for this business as purchased but some capital is expected to be invested to broaden the NOVONIX business by leveraging the skills within the business towards the development of new technologies, products and services.
- ◆ The NOVONIX equipment and services business is not expected to generate large revenues, however provides the company with a strategic advantage for the PUREgraphite business and other potential materials and battery solutions businesses in the future that can leverage its advanced battery testing, battery R&D capabilities, and equipment and product commercialisation skills.

PUREGRAPHITE JV

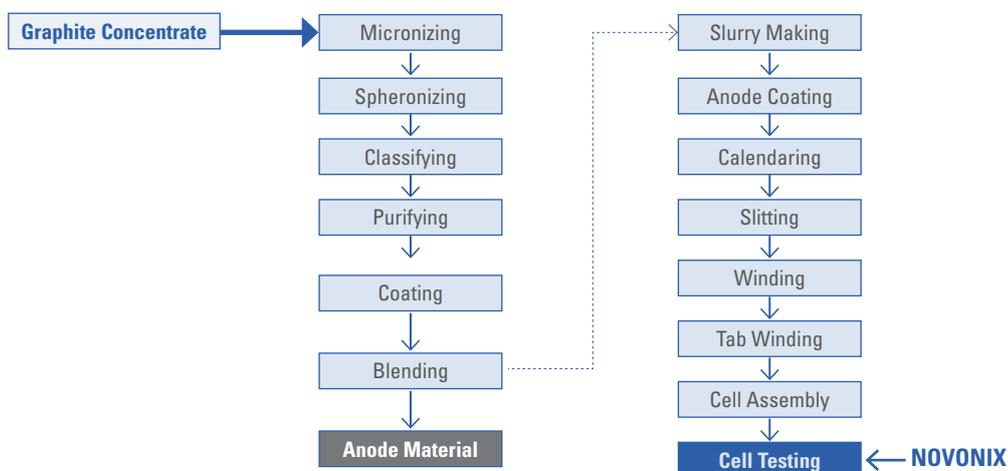
- ◆ PUREgraphite LLC was established in 2017 and is a 50:50 joint venture with NOVONIX Limited (NVX) and Coulometrics. NVX has the right to increase its interest to a controlling 75% for a set price in future.
- ◆ PUREgraphite seeks to produce ultra-high purity anode materials for LIBs.
- ◆ PUREgraphite is commercialising the proprietary process developed by Coulometrics to produce lower cost graphite anode materials for LIBs. Initial testing has indicated that the company's products can enhance a batteries life by up to 30% when compared to existing electric vehicle batteries.
- ◆ PUREgraphite will be the exclusive vehicle through which Coulometrics conducts research, development and commercialisation of graphite for use in battery and energy storage and services using graphite materials.
- ◆ PUREgraphite is seeking to commission its initial manufacturing facility and commence commercial production by 30 June 2018. The production capacity target is 1,000tpa. As part of the JV agreement, NVX has a right to increase its ownership to a controlling 75% for a set price and has exclusive rights to any product in excess of 1,000tpa.

- ◆ In conjunction with establishing the initial production target, PUREgraphite is assessing options to scale up operations to allow for the production of up to 100,000tpa. The company is seeking to have the plans for the expanded operations in place by 30 June 2018.
- ◆ The company is building the capacity to produce the 1,000tpa at the existing production facilities in Tennessee in the US, however will have to build a new facility for the expanded capacity.
- ◆ The company will be focusing on the electric vehicle and energy storage markets in the long-term from its expanded production capacity. In the short-term the company will be seeking to supply the military and other specialist applications in the US, a market which the company believes is currently ~5,000tpa.
- ◆ The company is sourcing artificial and natural graphite concentrates from existing producers and is testing these sources to determine the best source for their production process.

Production Process

- ◆ The production process to convert the graphite concentrate into anode material is detailed in the below graphic.
- ◆ The coating and blending processes are the proprietary processes and intellectual property of Coulometrics, which is now the intellectual property of PUREgraphite.
- ◆ The process has been designed to produce high quality LIB anode material at a lower cost and with lower carbon emissions than current producers.
- ◆ PUREgraphite is currently modifying and upgrading the existing Coulometrics facilities to accommodate production of the initial capacity with the goal of commissioning the plant by the end of FY18.

Production process



Value Potential

- ◆ We have provided some value metrics to show the potential value of PUREgraphite to the company in the event the company sells all of its capacity.
- ◆ According to market sources, anode material sells for between USD\$8,000/tonne and USD\$12,000/tonne. This is confirmed with Tesla stipulating that anode material for its electric vehicle batteries costs USD\$10,000/tonne. We have provided a potential revenue scenario below in the event the production facility operated at full capacity and sold all anode material produced.
- ◆ We note that the sale of the initial capacity to the military and other specialist applications may result in the company receiving higher prices.

Potential Revenue for PUREgraphite (Initial Capacity)		
Anode Material	USD\$8,000/tonne	USD\$12,000/tonne
Capacity	1,000 tonnes	1,000 tonnes
Revenue	USD\$8m	USD\$12m
NVX Revenue Share	USD\$4m	USD\$6m

- ◆ NVX expects to be able to produce the anode material for USD\$5,000/tonne. However, we note that the production costs will depend the combination of raw materials that the company uses (ie. synthetic and natural graphite) and the future cost of these raw materials.
- ◆ Using the company's estimates of USD\$5,000/tonne, would result in a profit before tax of USD\$3m-USD\$7m for PUREgraphite (USD\$1.5m-USD\$3.5m for NVX interest) for the initial capacity, based on the above prices.
- ◆ If we were to look at the potential value of the expanded capacity of 100,000tpa of anode material, the revenue potential is very attractive. Using the same prices as above, the below table shows the revenue potential of the company if it was to produce and sell 100,000tpa. We note we have assumed the company will exercise its option to increase its interest to 75% which means that the company receives all earnings for sales in excess of 1,000tpa. In the event the option is not exercised, earnings will remain a 50% split between the JV parties.
- ◆ There is still significant risk surrounding the expanded production facility given it is still currently in the conceptual phase and the operating costs may be materially different to the expectations for the initial production capacity. Further to this, PUREgraphite will be seeking to scale up capacity in a modular fashion with production trains/lines of 10,000tpa pursuant to demand. As such, the production capacity may not be expanded to the full 100,000tpa if the demand does not warrant the capacity.

Potential Revenue for PUREgraphite (Expanded Capacity)		
Anode Material	USD\$8,000/tonne	USD\$12,000/tonne
Capacity	100,000 tonnes	100,000 tonnes
Revenue	USD\$800m	USD\$1.2b
NVX Revenue Share	USD\$796m	USD\$1.19b

MOUNT DROMEDARY FLAKE GRAPHITE PROJECT

- ◆ The Mount Dromedary Flake Graphite Project (the Project) is a world class graphite deposit located 125km north-northwest of Cloncurry in Queensland. NVX initially held an 80% in the project and Washington H. Soul Pattinson (WHSP) owned the remaining 20% interest. In August 2016, the company announced that it had reached an agreement to merge the interests of the two company's into NVX. As compensation, WHSP was awarded 500,000 fully paid ordinary shares in NVX at \$0.60 per share (equivalent value of \$300,000).
- ◆ The company is currently seeking to develop the Project to take advantage of the growing LIB market and potentially secure the long-term supply of natural graphite concentrate for the PUREgraphite business.
- ◆ NVX completed an initial 400m reverse circulation drilling program in September 2015, which confirmed the presence of graphite schist at depth.
- ◆ The Project is in the early stages with a Feasibility Study yet to be completed. During the 1H'FY17, the company submitted an application for a mining lease with the Queensland Government and the company has submitted an application for environmental authority. The environmental authority has met all the legislative requirements and has moved to the information stage for assessment of the application.
- ◆ In addition to the standard key metrics of resource amount (tonnes) and graphite content, flake size and purity are key attributes of a graphite deposit. Graphite purity is particularly important for the higher value end uses such as LIBs and is a key determinant in the saleability of the product. Further to this, the higher the purity the lower the production cost with further processing for lower purity graphite increasing operating costs. With respect to flake size, the larger the flake in a given deposit the higher the purity is likely to be and the higher the price received.
- ◆ The most recent JORC Resource Estimate was released in October 2016. The Mineral Resource estimate is based on exploration drilling and test results covering less than 50% of the deposit. The total JORC Mineral Resource estimate for the deposit is currently 14.3m tonnes with 1.908m tonnes of graphite with a 4% graphite carbon cut-off.

Total JORC Mineral Resource Estimate (Measured, Indicated & Inferred)					
Grade	Type	Tonnes (m)	TGC (%)	TC (%)	Contained Graphite (kt)
High Grade (>10% TGC)	Weathered	1.3	17.5	18.8	227
	Primary	7.2	18.6	19.5	1,335
	Sub-Total	8.5	18.4	19.4	1,562
Medium Grade (4% to 10% TGC)	Weathered	0.9	5.7	6.7	51
	Primary	5.0	6.0	6.6	295
	Sub-Total	5.8	5.9	6.6	346
Total		14.3	13.3	14.2	1,908

- ◆ 35.8% of the deposit is large and jumbo flake size which is the highest purity and attracts the highest sales price.

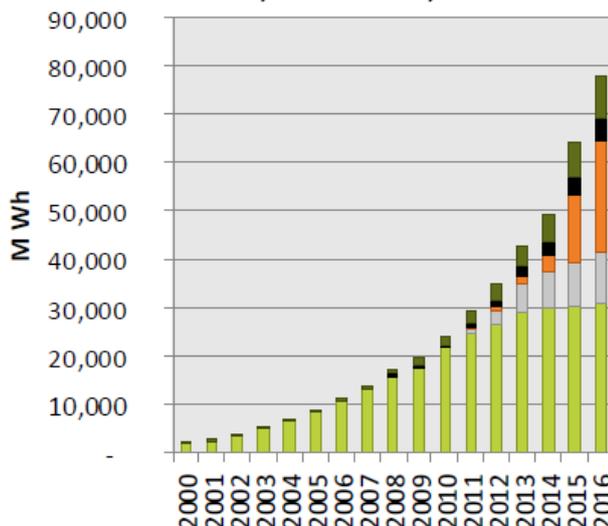
Flake Size (Total Graphite Carbon)			
Classification	Sieve Size	% Interval	Cumulative %
Junbo	>300	18.8%	18.8%
Large	180-300	17.0%	35.8%
Medium	150-180	6.2%	42.0%
Fine	75-150	25.2%	67.2%
Very Fine	<75	32.8%	100.0%

- ◆ Samples testwork has indicated approximately 93% recovery rates are achievable for primary material and 85% for weathered material to produce a 95% graphite concentrate.
- ◆ The company has also completed thermal purification and initial physical and electrochemical suitability tests on concentrate produced from the Project to determine the suitability of the concentrate for the LIB market. Purification tests confirmed that the graphite concentrate can be purified to 99.999%, making it a suitable for the LIB market. The company also manufactured LIB coin cells using the concentrate. The results showed that the materials appear to be well suited for LIB applications including electric vehicle applications.
- ◆ During 1H'FY17, the company commenced a small scale pilot plant test program in Brazil, designed to improve the process knowledge and process plant design.
- ◆ A Scoping Study was completed in August 2016 for the Project. The Study assessed the economics of developing a mine with an average concentrate grade of 95% TGC using open pit mining techniques. Target production is 50,000tpa, which would require an input feed rate of 325,000tpa. The Study was based on the concentrate being trucked to the port of Brisbane and then exported to the US or Asia. The Study was based on some initial production cost assumptions, however, the results and full details of the assumptions of the Scoping Study were not released to the market.
- ◆ Some key aspects of the mine include:
 - The Project is located in Australia with low levels of sovereign risk providing a secure supply of graphite concentrate, providing an alternative source to concentrate provided by China and Africa.
 - Open cut mine surrounded by existing mining and transport infrastructure.
 - Close proximity to the port of Brisbane, which is regularly serviced by major shipping liners and has back-haul capacity to the company's target markets.

LITHIUM ION BATTERY ANODE MARKET

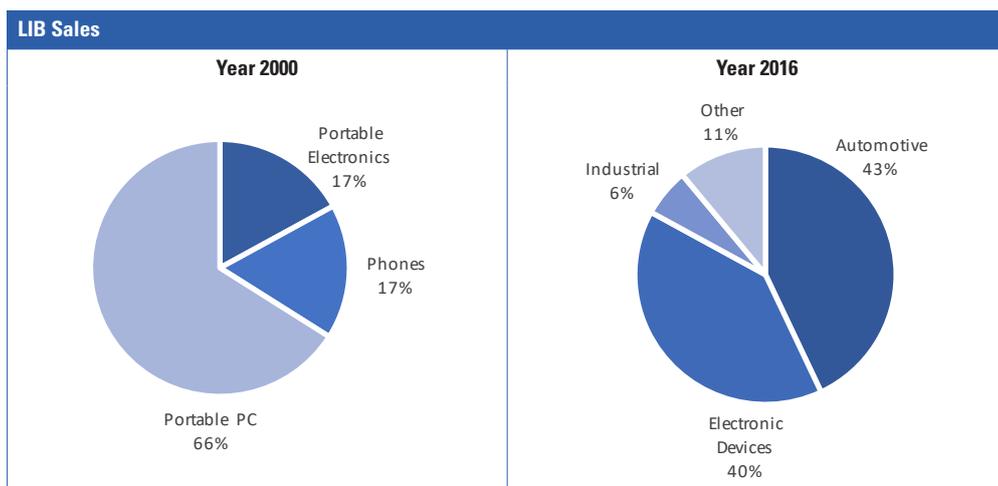
- ◆ The global lithium ion battery (LIB) market is poised for significant growth as the world moves towards battery technology for use in clean energy, vehicles and consumer products. The LIB market has already seen rapid growth during the last two decades. As shown in the below chart, global LIB sales have grown from less than 5,00MWh in the year 2000 to 78,000MWh in 2016. That represents a compound annual growth rate of 19%.

Li-ion Battery sales, MWh, Worldwide, 2000-2015



Source: Avicenne Energy "Lithium ion battery raw material supply & demand 2016 - 2025"

- ◆ The development of LIBs has expanded the applications of the batteries and demand has shifted to new applications, as shown below. In the year 2000, all LIBs were used in portable electronic devices. This compares to 2016, in which only 40% of sales were for electronic devices. The largest consumer of LIBs was the automotive market.

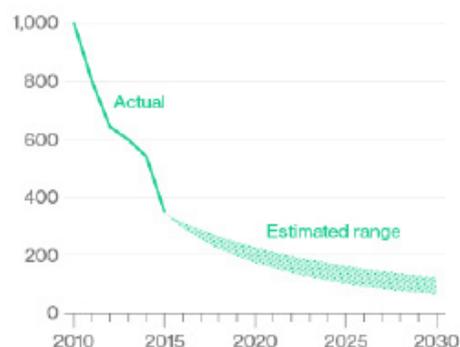


Source: Avicenne Energy "Lithium ion battery raw material supply & demand 2016 - 2025".

- ◆ The areas driving growth for the market moving forward is energy storage and electric vehicles.
- ◆ One of the markets the company will be targeting is the electric vehicle market. In 2010, there was less than 15,000 electric vehicles. This number is expected grow to around 4m by 2020. As battery costs continue to fall, it is expected that the demand for electric vehicles will rise. The below charts highlight the expected decline in the price of battery packs and the subsequent expected increase in demand for battery power for electric vehicles.
- ◆ The forecast rise in demand for electric vehicles has been further fuelled by a number of European countries announcing that they will be ceasing the sale of petrol fuelled cars. These announcements have coincided with a number of car manufacturers announcing a significant investment in the development and production of electric vehicles.

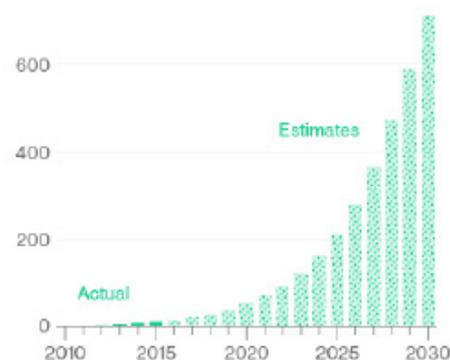
Cost for lithium-ion battery packs

\$1,200 per kilowatt hour



Yearly demand for EV battery power

800 gigawatt hours



Source: Data compiled by Bloomberg New Energy Finance

Bloomberg

- ◆ To satisfy the increased demand for LIBs, there are a number of megafactories under construction. According to Benchmark Minerals there are currently 12 megafactories under construction - 7 in China and 2 in the US. In the US, Tesla is building a factory in Nevada and LG Chemical is building a plant in Michigan. By 2020, LIB production is expected to be primarily from China and the US.

Global LIB Production Capacity in 2020

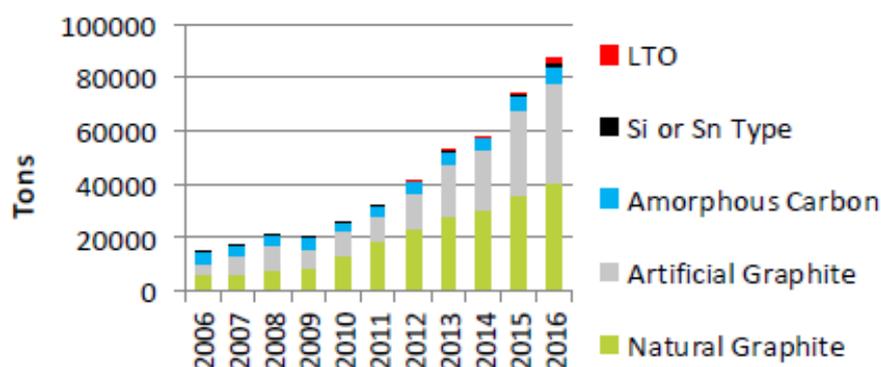
Country	Capacity	% of Global Production
China	108GWh	62%
US	38GWh	22%
South Korea	23GWh	13%
Poland	5GWh	3%
	174GWh	100%

Source: NVX

Anode Material Demand

- ◆ Anodes are one of three major parts of a battery cell, the others being the Cathode and Electrolyte. For the effective development of a high energy density battery, the use of high capacity electrode materials (anode and cathode) is essential.
- ◆ Anodes are primarily made from both natural and synthetic graphite materials. The natural graphite is heavily processed to create 'coated spherical graphite' (anode material).
- ◆ Synthetic graphite is manufactured by the high temperature treatment of amorphous carbon materials. The primary feedstock used for making synthetic graphite is calcined petroleum coke and coal tar pitch. The costs to produce synthetic graphite are significantly greater than that of natural flake graphite.
- ◆ Given anodes are a vital element of a battery, the demand for anode materials will follow the increased demand for LIBs. This has been evident from the growth in anode material demand to date (see below chart). The LIB anode material market is expected to grow to in excess of 200,000tpa in 2020. That is more than double the sales from 2016.
- ◆ The raw materials are the largest cost for LIB production accounting for between 50% and 70% of production cost. Anode materials accounts for approximately 6% of the cost and makes up around 20% of the battery cell weight.

LIB Anode Market



Lithium Ion Battery Anode Material Producers

- ◆ Currently, the battery anode market is concentrated with China and Japan accounting for 95% of global anode material sales. The two largest producers of lithium ion battery anode material are BTR New Energy Materials Inc. (based in China) and Hitachi Chemical (based in Japan). These two companies account for over 40% of global LIB anode materials.
- ◆ Both companies are expanding production capacity to satisfy the expected demand from the megafactories. BTR is expected to double its capacity and Hitachi Chemical have announced that they are seeking to increase production capacity of LIB anode material by four-fold to 100,000tpa by 2020. Hitachi Chemical is expected to invest \$90m on the expansion. The capacity expansion of these two companies is expected to double the current market share.
- ◆ With a number of countries looking to diversify their dependence on Chinese produced materials, there is an opportunity for new entrants producing high quality materials to enter the market to satisfy demand. While there are a number of companies seeking to enter the market, there are high barriers to entry for the development of high purity and high performing anode materials that meet the requirements for electric vehicles.

INVESTMENT CASE

- ◆ NVX provides the opportunity to gain exposure to the LIB market, which is poised for a significant period of growth.
- ◆ The strategic acquisition of NOVONIX Battery Testing Services Inc. puts the company in an advantageous position compared to its competitors regarding testing times for batteries and research and development.
- ◆ While the NOVONIX acquisition provides the company with a strategic advantage for battery development, business growth will come from the PUREgraphite business. The barriers to entry for this market are high with two companies dominating the LIB anode materials market. Given the high barriers to entry, the ability to gain a foothold through a competitive product will give them the opportunity to participate in the growing LIB market.
- ◆ The upside value from the PUREgraphite business is significant. Offtake of the initial capacity will generate small revenues with significant value potential from the expanded operations.
- ◆ The company has a valuable asset in the Mount Dromedary Flake Graphite Project. While this will not be a focus in the short-term, the Project potentially provides the PUREgraphite with a secure supply of graphite concentrate for its anode material. Once developed, this will also be a significant asset for those seeking to diversify their graphite concentrate supply from China.
- ◆ While there is significant upside potential there are also risks associated with the company. The company is yet produce any anode materials on a large scale. The company is also yet to secure any supply agreements for its initial anode material production. Securing its first customer will be a significant milestone for the company. Further to this, the company will likely require a significant capital injection for the construction of the expanded production facilities and the development of the Mount Dromedary Flake Graphite Project, in the event a final investment decision is made.

CAPITAL STRUCTURE

- ◆ The company currently has 103.2m shares on issue, 47.2m (45.7%) of which are held in escrow. The company has 1.6m performance rights and 14.0m unlisted options on issue with varying expiration dates and exercise prices, as detailed below.
- ◆ At 14 August 2017, the company's share price was \$1.18. All options on issue are currently in-the-money.
- ◆ In 1H'CY17, the company issued \$15.5m in convertible loan notes to raise capital for the new business ventures, in which 1 note was equivalent to 1 NVX share. Almost 10m convertible loan notes have been converted into NVX shares to date.

Capital Structure	
Shares on Issue	103.2m
Performance Rights	1.6m
Unlisted Options:	
Exercise Price of \$0.30 expiring 31 December 2017	2.0m
Exercise Price of \$0.30 expiring 30 June 2019	3.0m
Exercise Price of \$0.30 expiring 30 June 2019	2.0m
Exercise price of \$0.51 expiring on cessation of employment	6.0m
Exercise price of \$0.60 expiring 7 April 2020	0.45m
Exercise price of \$0.90 expiring 14 July 2022	0.53m
Loan Notes	13.6m

- ◆ The shareholder register is tightly held with the four largest shareholders owning 70% of the shares on issue. The tightly held register will likely result in low levels of turnover.

Top Four Shareholders		
Shareholder	Number of Shares (M)	% of Shares on Issue
Gregory Baynton	29.6	29.5
Philip St Baker	16.1	16.1
Washington H. Soul Pattinson and Company Limited	16.0	16.0
Anthony Bellas	3.9	3.9
Total	65.6	70.0

RISKS

- ◆ **Exchange Rate Risk:** The primary businesses of NVX are located in the US and Canada. As such, any movements in these foreign exchange rates will impact the value of revenues and expenses in AUD for reporting, either positively or negatively.
- ◆ **Competition Risk:** Lithium ion battery anode material production has high barriers to entry, however, increasing demand for LIBs has seen new entrants enter the market. New entrants will make the market more competitive and may result in reduced margins, albeit from high levels, or take potential market share from NVX.
- ◆ **Offtake Risk:** The company is yet to secure a supply contract for the initial production capacity for the PUREgraphite business. The company is in initial discussions with potential customers in the US, however, yet to secure a supply contract for the anode material. There is the risk that the company will not be able to sell the material it produces.
- ◆ **Supply Chain Risk:** PUREgraphite is currently testing different suppliers of graphite concentrate, both natural and synthetic, for the production of the anode material. An inability to secure a reliable concentrate supply may impact the quality of the anode material produced.

- ◆ **Dilution Risk:** The company will likely have to raise additional capital for the expansion of the PUREgraphite business. Given the low revenue base of the company we would expect an equity raising to be part of the capital raise. This will likely dilute existing shareholder positions.
- ◆ **Project Development Risk:** The company is still in the early stages of the development of the Mount Dromedary Flake Graphite Project, with the company yet to complete a Feasibility Study. There are significant risks associated with the development of resource projects including financial, regulatory and construction risks.

BOARD AND MANAGEMENT

Tony Bellas: Non-Executive Chairman - Mr. Bellas has over 30 years experience in both the government and private sectors. Mr. Bellas has previously held the positions of CEO of Ergon Energy and CS Energy and was the Deputy Treasurer of the Queensland Government, which included leading the teams responsible for the privatisation of state owned assets. Mr. Bellas is currently the Non-Executive Chairman of Corporate Travel Management Limited (ASX: CTD), ERM Power Limited and Shine Lawyers Limited.

Philip St Baker: Managing Director - Mr. St Baker joined NVX in August 2015. Prior to joining NVX, Mr. St Baker was the Managing Director of ERM Power, which grew turnover from \$10m to \$2b under his watch and was the fastest growing energy retail business in Australia. Mr. St Baker is the owner and a representative of the St Baker Energy Innovation Fund, a private investment fund in early stage technology companies in Australia and the US. Mr. St Baker is also a member of the Queensland Advisory Board for the Starlight Foundation.

Greg Baynton: Non-Executive Director - Mr. Baynton founded NVX in 2012 with the aim of securing high quality graphite deposits as an initial energy strategy into the LIB materials supply chain. Mr. Baynton has a career spanning across both the government and private sector, including appointments in investment banking, infrastructure investment, M&A, IPOs, public company directorships, government agencies. Mr. Baynton was a founding Director of NEXTDC Limited (ASX: NXT), PIPE Networks (ASX: PWK), Asia Pacific Data Centre Limited (ASX: AJD) and Coalbank Limited (CBQ). Mr. Baynton is currently a Director of Superloop Limited (ASX: SLC), a telecommunication company.

Robert Cooper: Non-Executive Director - Mr. Cooper is a mining engineer with more than 25 years experience in the industry. Mr. Cooper has a broad foundation of operating and technical experience in both underground and open pit operations. Mr. Cooper is currently the CEO of CopperChem Limited and Exco Resources Limited, both of which are 100% owned subsidiaries of Washington H. Soul Pattinson and Company Limited. Mr. Cooper is currently a Non-Executive Director of Verdant Minerals Limited (ASX: VRM).

Admiral Robert Natter: Non-Executive Director - Admiral Natter is the most recent appointment to the NVX Board. Admiral Natter retired from active military service a decade ago and has since served on a number of US Boards and Advisory panels in both the public and private sectors. Admiral Natter served in the US Navy for 41 years during which time he served as the Commander in Chief of the US Atlantic Fleet and as the First Commander of US Fleet Forces Command, overseeing all Continental US Navy bases, facilities and training operations. Admiral Natter is President of R.J. Natter & Associated, LLC, a US consulting and advocacy firm specialising in corporate and defence strategy. Admiral Natter is currently a Non-Executive Director of BAE Systems Inc, Allied Universal, Corporate Travel Management Limited (ASX: CTD), Chairman of the US Naval Academy Alumni Association and a Director of the Yellow Ribbon Fund (a US wounded veteran charity).

Suzanne Yeates: CFO/Company Secretary - Ms. Yeates is a Chartered Accountant with more than 15 years experience. Ms. Yeates has worked for a number of companies throughout her career, including CoalBank Limited, Acer Energy Limited, Norton Gold Fields Limited, Anova Metals Limited, Diatreme Resources Limited, Bengal Energy (Australia) Pty Ltd, Terra Nova (Australia) Pty Ltd, Roar Resources Pty Ltd and Compass Coal Pty Ltd.

Dr. Edward Buiel: CEO PUREgraphite - Dr. Buiel founded Coulometrics in 2008 and co-founded PUREgraphite in 2017. Dr. Buiel gained his PhD in 1998 from Dalhousie University under Jeff Dahn, studying the development of carbon anode materials for LIBs. Dr. Buiel has extensive experience in high performance anode materials for LIBs and innovative processing/production technologies. Dr. Buiel has extensive experience in the development and commercialisation of energy/battery cell materials. Dr. Buiel has held a number of roles in this area, including CTO of Loxus Inc, VP Manufacturing at Pellion Technologies, CTO at Axion Power, and Group Leader at MeadWestvaco.

Dr. Chris Burns: CEO NOVONIX - Dr. Burns co-founded NOVONIX in Canada in 2013. Dr. Burns gained his PhD from Dalhousie University where he played a key role in the invention of High Precision Coulometry. NOVONIX was spun out of Dalhousie University and today manufactures the highest accuracy battery test equipment in the world and is used by leading battery makers, manufacturers and researchers. Dr. Burns is a former Senior Battery Research Engineer with TESLA.

Dr. David Stevens: CTO NOVONIX - Dr. Stevens co-founded NOVONIX in 2013. Dr. Stevens was a former research associate at Dalhousie University with the Jeff Dahn Research Group that now works exclusively for TESLA. Dr. Stevens has extensive R&D experience with LIBs, carbon materials and high precision battery cell measurement techniques. Dr. Stevens has previously worked for Pacific Lithium and Comalco.

Steve Hadwen: Mount Dromedary Project Director - Mr. Hadwen has over 30 years experience in the mining industry. Mr. Hadwen had a long career at BHP Billiton (ASX: BHP) during which time his roles included: Head of Technology Department, VP/Head of Resource Planning and Development, Manager Development, Manager Mine Engineering at BHP Coal Melbourne and Manager Engineering and Development at BHP Coal Indonesia.

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