



Intellectual Property and Operational Update

*Accelerating adoption of batteries
for a cleaner energy future*

Friday, 20 September 2019



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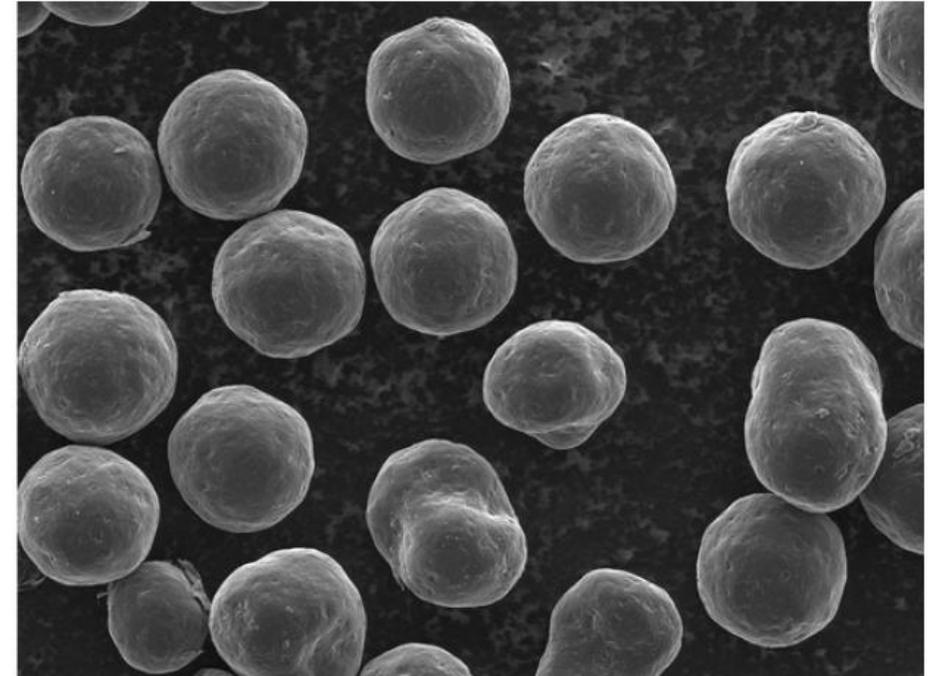
- As high-technology manufacturer and supplier, NOVONIX is investing in intellectual property and new disruptive technologies with short-to-medium term commercialisation potential
- Intellectual property development is undertaken via a significant in-house team, and via the contract R&D arrangements with Dalhousie University previously announced
- NOVONIX is investigating simple, material-efficient and environmentally friendly technologies with significant commercial potential for the global battery sector, and other industries
- New intellectual property technologies have commercial application in the cathode, anode and electrolyte markets, and potential applications in other sectors

Photo: Dr Chris Burns COO NOVONIX and Professor Mark Obrovac of Dalhousie University inspecting the electrode coating line at the NOVONIX battery cell pilot line.



Dry process to aggregate small particle precursor formulations into larger spherical particles with improved properties that are useful for lithium-ion batteries and other applications (Filing date: 29 August 2019)

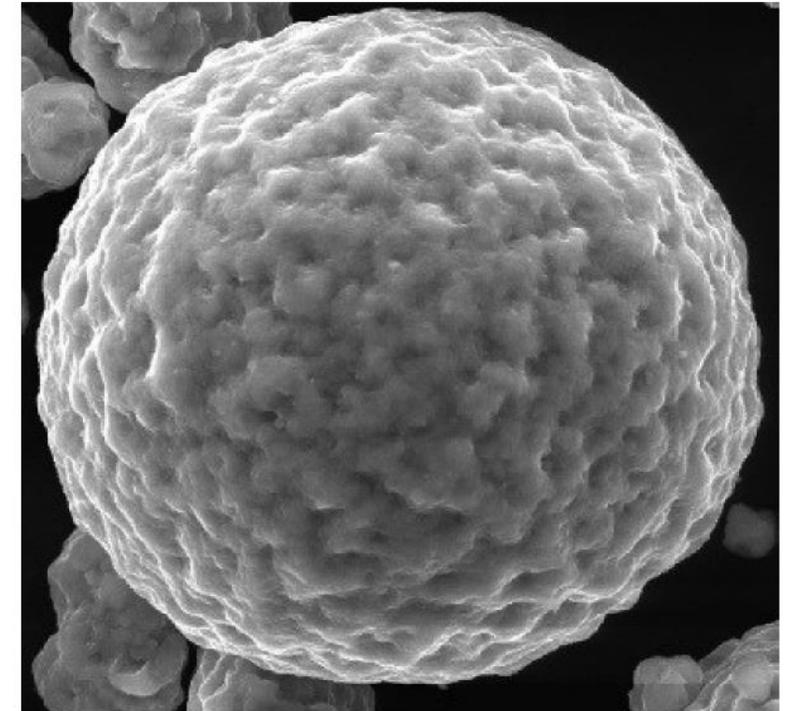
- The technology underlying this patent application was developed by Professor Mark Obrovac and his team at Dalhousie University with intellectual property rights assigned exclusively to Novonix under previously announced broad research sponsorship agreement
- The invention involves a dry processing method for aggregating precursor particles into larger product particles with improved properties
- The product particles are useful in applications requiring uniform, smooth, spherical, or rounded particles such as for electrode materials in lithium batteries and other applications
- The method is simple, material-efficient, environmentally friendly and advantageous for industrial use because of the elimination of solvents
- It is early stages for this invention and NOVONIX is motivated about its potential for the battery and other industries
- The next challenge is applying and scaling the technology for economic manufacture of new cathode and anode products for the battery industry



50 μm

Dry process for modifying and coating polycrystalline particles to make improved materials for batteries applications (Filing date: 27 March 2019)

- The technology underlying this patent application was developed by Professor Mark Obrovac and his team at Dalhousie University with intellectual property rights assigned exclusively to Novonix under previously announced broad research sponsorship agreement
- The invention involves improved polycrystalline particulates, methods for modifying the surface of the particulates, and lithium insertion cathode and rechargeable lithium batteries comprising such particulates
- The surface layer of polycrystalline particulates are smoothed and coating layers can be applied with both coated and uncoated products showing improved performance in battery applications
- The method is simple, material-efficient, environmentally friendly and advantageous for industrial use because of the elimination of solvents
- It is early stages for this invention and NOVONIX is motivated about its potential for the battery and other industries
- The next challenge is applying and scaling the technology for economic manufacture of new cathode and anode products for the battery industry



5 μm

Previous July - December outlook

- Continue to grow equipment sales with focus on custom solutions
- Deliver large customized order to customer
- Publish white papers on DTA and HPC experiments to demonstrate importance of equipment
- Large growth in cell building and testing services
- Begin several new long-term customer research projects for cell design and evaluation
- Develop and file on new materials IP with Dalhousie University research partnership
- Develop, and file patent(s), on new electrolyte IP from internal research programs

Actual progress for July - August

- Customer changes on large custom order has caused us to miss delivery in FY18 which impacted our accounting revenue for the year leading to missing our 30% growth target
- Large custom order being wrapped up with receipt of final components and is expected to ship in October
- In July and August we started half a dozen new services contracts (including KORE Power) covering specialized cell testing, materials testing, cell building, battery design and cell prototyping and battery technology consulting
- In August via our Dalhousie University partnership we filed a third patent application for an invention in making novel engineered particles via a dry processing method
- In August we were granted a US patent for a method for nondestructive evaluation of the liquid electrolyte and we have strong customer demand for it

Answer to a common question about our PUREgraphite business

Question: What is the difference between a natural graphite concentrate produced from a graphite mine and what is manufactured by NOVONIX's PUREgraphite business in the USA?

Answer: PUREgraphite manufactures battery anode material which is a more refined product than graphite concentrate.

- Natural graphite concentrate is not ready to go into a lithium-ion or an alkaline battery.
- Natural graphite concentrate has many uses and one is as a precursor material that can be converted into a **“Battery Ready”** material via a series of complex (often proprietary) and expensive manufacturing process steps
- The value of “Battery Ready” natural graphite based anode material is typically **5 to 10 times higher** than natural graphite concentrate from a mine and it is typically customized for a customer and battery applications
- “Battery Ready” anode material is also made from **artificial** graphite made from materials such as coal or petroleum coke
- The value of “Battery Ready” **synthetic (artificial** graphite based) anode material is typically **10 to 20 times higher** than natural graphite concentrate from a mine and it is also typically customized for a customer and battery application
- PUREgraphite is a “Battery Ready” anode material manufacturer and has capability to manufacture synthetic, natural and blended battery anode products to meet customer requirements, and
- The name **“PUREgraphite”** is a brand name for our graphite based battery materials and reflects the ultra high purity of our material being 99.999%+ pure. By comparison natural graphite concentrate from a mine averages around 95% purity

Previous July-December outlook

- Expand product trials and technical exchange with domestic US & global battery makers
- Achieve first commercial production by the end of August 2019

Note that this is two months later than original target due to decision to relocate the whole operation to a larger facility with greater expansion capability

- Negotiation of supply agreements will be an expanding activity as we progress through customer qualification programs underway
- Expansion of manufacturing capacity based on anticipated customer requirements
- Ongoing product development leveraging our expanded R&D and cell making capabilities in Halifax and our partnership with Dalhousie University

Actual progress for July-August

- Started product qualification trials with another major prospective customer in July and completed progress reviews on product qualification trials already underway with other prospective major customers
- Made good progress building out the first commercial production line but incurred unplanned delays in delivery and installation of some critical pieces of equipment
- We are now forecasting first commercial production to occur late in October
- Negotiation of supply agreements has commenced with several prospective customers
- Expansion of manufacturing capacity will be based on customer requirements which is yet to be determined
- PUREgraphite now integrated into next generation battery materials R&D program in Halifax and including our partnership with Dalhousie University

Corporate

Group Managing Director

Contact: Philip St Baker
Email: phil@novonixgroup.com
Telephone: +1 970-376-4918
Telephone: +61 438-173-330

Group Executive Director

Contact: Greg Baynton
Email: greg@novonixgroup.com
Telephone: +61 414-970-566

Group CFO and Co Secretary

Contact: Suzanne Yeates
Email: suzanne.yeates@oasolutions.com.au
Telephone: +61 439-310-818

Battery Technology Solutions



Dartmouth, Nova Scotia, CANADA
177 Bluewater Road, Bedford, NS B4B 1H1,
Canada

CEO - NOVONIX BTS

Contact: Dr Chris Burns
Email: chris@novonixgroup.com
Telephone: +1 902-449-9121

CFO - NOVONIX BTS

Contact: Nick Liveris
Email: nick@novonixgroup.com
Telephone: +1 989-859-3213

PUREgraphite



Chattanooga, Tennessee, USA
353 Corporate Place, Chattanooga, TN,
37419, USA

CEO - PUREgraphite

Contact: Dr Chris Burns
Email: chris@novonixgroup.com
Telephone: +1 902-449-9121

CFO - PUREgraphite

Contact: Nick Liveris
Email: nick@novonixgroup.com
Telephone: +1 989-859-3213