



29 August 2018

## HIPO TO EARN-IN TO ADVANCED BATTERY TECHNOLOGY BUSINESS

- HIPO right to earn up to 35% of *Next-Battery*, which is developing a unique higher performance Lithium-ion battery prototype based upon several years of cathode development by *Next-Battery's* highly experienced materials scientific team.
- The technology uses lithium-ion chemistries with novel nano-structuring technology to effectively “upgrade” a battery electrode’s functional properties. The proprietary process significantly increases the surface area of the metal oxides in the cathode. This enables cathodes that are ultra-porous, and lithium infused within a nanostructured surface to enable faster lithium ion transport and electron movement in a more energy dense structure.
- Laboratory studies on the cathode by the *Next-Battery* scientists have shown the *Next-Battery* technology can more than double the specific energy of the best commercial lithium-ion batteries today.
- *Next-Battery's* 6-12 month development plan is to demonstrate a (minimum) 100% increase in the specific energy of its commercial battery prototype, which could potentially double the EV driving range, assuming the same weight of battery. Significantly it would double the time between charges for mobile phones and all electronic applications. Laboratory updates and results will be ongoing.
- *Next-Battery's* technology approach is significantly different to the traditional focus of most battery scientists which concentrate on improving battery chemistries and battery construction.
- Nature of *Next-Battery* cathode applications lends the technology to adoption by existing battery manufactures without significantly changing battery chemistries or their manufacturing processes.
- Investment complements existing lithium development project (Kamola) with Crown Mining in the DRC and processing joint venture with St George Eco Mining.
- Consistent with the Company’s strategy of building a lithium-ion battery technology division backed by strong and experienced leadership.



### ***Next-Battery***

Battery minerals company **HIPO Resources Limited (ASX: HIP) (HIPO or the Company)** is pleased to announce it has agreed to acquire up to an initial 35% holding through an equity earn in of established lithium-ion battery technology company, *Next-Battery*. ([www.next-battery.com](http://www.next-battery.com))

### ***Next-Battery***

*Next-Battery's* technology involves unique lithium-ion chemistries with novel nano-structuring technology to effectively “upgrade” a battery electrode’s functional properties. The proprietary process significantly increases the surface area of the metal oxides in the cathode which allows dimension reduction and doping to increase functionalisation and morphology control. This enables cathodes that are ultra-porous, and lithium infused within a nanostructured surface to enable faster lithium-ion transport and electron movement in a more energy dense structure.

Laboratory studies on the cathode by the *Next-Battery* scientists have shown that the *Next-Battery* technology can more than double the specific energy of the best commercial lithium-ion batteries today, such as the new Tesla/Panasonic 2170 cell used in the Model 3 battery pack. Recharge time should also improve based upon tests to date.

*Next-Battery* uses sophisticated and unique production equipment for the manufacturing of the nano-structured cathode that upgrades the performance of the battery. The manufacturing process is scalable and suited for mass production as it could be integrated into existing commercial lithium-ion battery production manufacturing lines allowing for rapid deployment via exclusive licensing arrangements.

### **Electric Vehicle and Battery Storage Application**

The rapidly developing market for electric vehicles is largely dependent upon one key factor, ***“how much energy the battery holds and how quickly it can be discharged and charged”***.

The higher the specific energy and energy density, then the further the vehicle could travel with the same size and weight of battery. In addition to electric vehicles, the *Next-Battery* technology is potentially transferrable for use in everything from mobile phones and computers to power storage banks for homes or power grids.



## Leadership and Development Plan

**Next-Battery** was founded in 2018 based upon over 10 years of electrode R&D and is led by Benton Wilcoxon, who is highly experienced in the commercialisation of advanced materials technology as well as supercapacitor and battery technologies. He has spent years creating new companies that develop and commercialise novel products using advanced materials science teams in Ukraine, the USA and Europe. Currently he is the CEO of NextMetals Ltd, which is commercializing high-strength nano-structured titanium, super steels, and ceramics for high-performance applications in aerospace, defence and vehicle applications, all of which can be 3D printed. His past accomplishments include developing and commercialising the most energy efficient conductor for high voltage transmission lines, which have been deployed on 60,000 kilometers of transmission lines in over 550 projects across 50 countries. He pioneered the development and commercialisation of the highest strength aluminum alloy, known as Aluminum Scandium, which is used in aircraft, aerospace, naval ships, vehicles, and high-performance sports equipment.

*Next-Battery's* team consists of several material scientists with decades of experience in the development of semi-conductor materials, thin film deposition of metal oxides, super-capacitor cathodes, conductive and non-conductive films, ceramic and polymer materials for selective ion separation, nucleonic materials, and nano-powders.

The current plan is to have a state-of-the-art prototype battery demonstrated within 5-7 months to show a minimum 50% increase in specific energy along with a faster charge rate. In simple terms, that means the *Next-Battery* should increase the driving range by up to 50% assuming the same weight of battery.

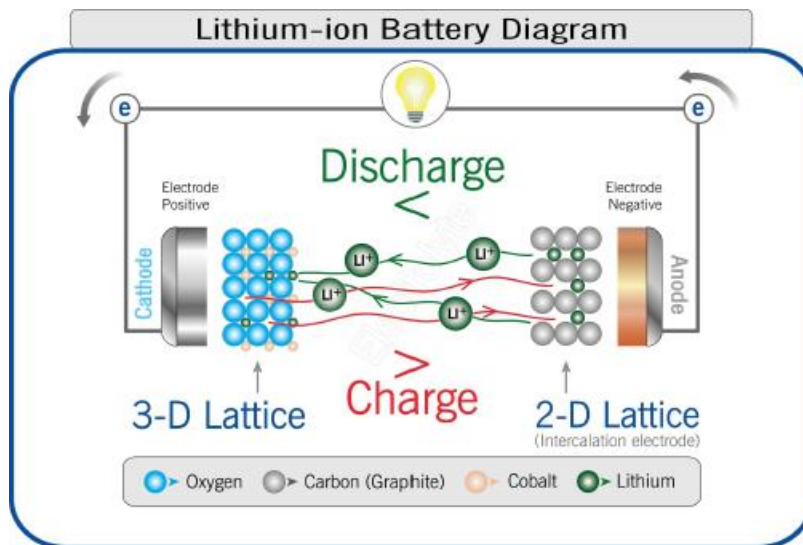
Within 9-12 months, the plan is to demonstrate a minimum 100% increase in specific energy, which should double the driving range, assuming the same weight of battery. Laboratory updates and results will be ongoing.

*Next-Battery* has pilot-production equipment and facilities in Ukraine to fast track development activities. The *Next-Battery* technology team leaders are well known published and respected members of scientific institutes in novel advanced materials' nano and micro-structures and have developed processes to apply those materials in various semiconductor and functional film applications.

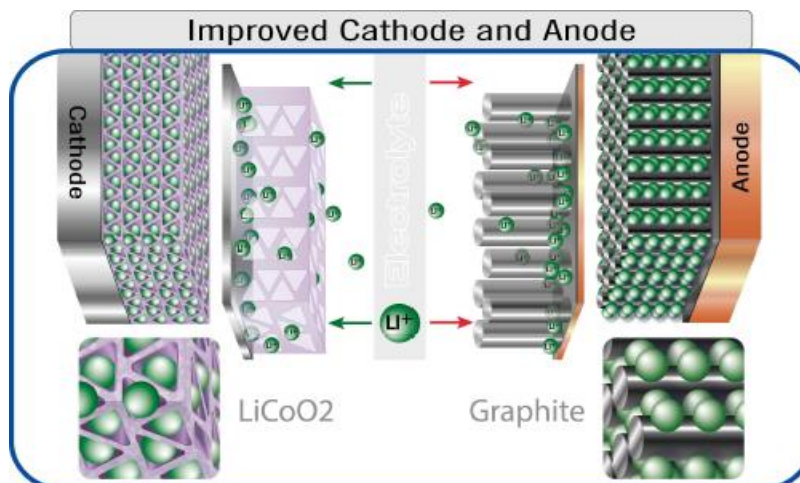


### Understanding the Technology

A short explanation of a lithium-ion battery is that they are made of two electrodes – a cathode (positive) and the anode (negative) – and an electrolyte through which the electric charge flows as the lithium ions and the electrons move between the cathode and anode when the battery charges and discharges (diagram below).



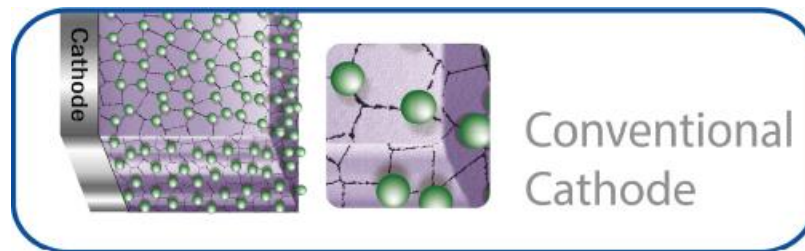
The diagram below of *Next-Battery's* improved cathode and anode shows graphically how its unique nano-structure allows more lithium ions (Li+) to be neatly packed into the electrodes, since they have to move back and forth between the cathode and anode during the discharge and charge actions.





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The diagram below shows that conventional cathodes use compressed powders of various metals oxides in a less structured form to accept the Li<sup>+</sup> ions.



### Why *Next Battery*?

- Next technology approach is significantly different than the traditional focus of most battery scientists and manufacturers.
- Major battery companies are focused on improving battery chemistries and better battery construction with mass manufacturing capability.
- Most members of the *Next-Battery* scientific team do not come from the battery industry, but instead from advanced materials science in both ultra-conductive and non-conductive materials, such as ones used in semiconductors as well as functional materials applied to substrates such as glass than can change functional properties by applications of small electrical currents, solar energy, or heat energy.
- Key point of difference is a lot of battery scientific research work that has been recently done in the USA, Japan, and Europe in well-funded laboratories with state-of-the-art equipment focussing on chemistry and construction. The *Next-Battery* team has completed numerous experiments to develop nano-structures to apply various metal oxides, which create ultra-porous structures to both hold and transfer lithium-ions. The technology process can be produced on a mass scale at a reasonable cost.
- The *Next-Battery* lithium-ion electrode nanomaterials have unique physical and chemical properties, such as a very large surface area, shorter transport length, high reversible capacity and long cycle life. These properties can significantly improve specific capacity and high-rate performance of lithium-ion batteries.

### 35% Earn in Right

HIPO Resources has entered into a Heads of Agreement with *Next-Battery* whereby HIPO has the right to earn up to a 35% equity interest in *Next-Battery Limited* (the company which owns all proprietary rights to the battery technology and has secured exclusive rights to staff, equipment and testing facilities) on the following terms:



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- a) 25% by spending US\$500,000 on an agreed budget for the development of the *Next-Battery*;
- b) Option to spend an additional US\$1,000,000 on *Next-Battery* development for a further 10% equity interest;
- c) Issue of 10m HIPO Shares to *Next-Battery* (or nominee) on the following milestone basis:
  - a. 5m upon demonstration of prototype battery demonstrating minimum 50% increase in specific energy compared to current Tesla battery model; and
  - b. 5m upon demonstration of prototype battery demonstrating minimum 100% increase in specific energy compared to current Tesla battery model.
- d) Formal documentation to be finalised on or before 7 September 2018.

**HIPO Executive Chairman Maurice Feilich commented:** *“The Next-Battery earn-in is a game changer for HIPO and consistent with our strategy of building three growth pillars – lithium assets, cobalt assets and a technology division – to capitalise on the fast growing lithium-ion battery market. Having this initial investment in Next Battery gives us meaningful exposure to an emerging technology that is being developed by a highly credible and trusted team.*

*The Board believes that the Next-Battery earn in is indeed a unique opportunity for HIPO to gain exposure to one of the biggest growth industries in the world whilst at the same time consolidating its exposure to physical lithium and cobalt metals through previously announced farm-ins.*

*“Benton Wilcoxon and his team are highly respected and advancing well with their activities. They have a strong dialogue going with the automotive industry and we expect the business to provide a steady stream of updates in the coming months.*

*“With a solid farm-in partner on our exciting phosphate project in Uganda, we can focus our efforts and funds on building out our three growth pillars. More updates are pending.”*

**Benton Wilcoxon, CEO of Next-Battery, commented:** *“We are pleased that this opportunity will allow us accelerate our lithium-ion battery prototype. The first funding tranche will be quickly deployed on finalizing our nano-structured electrodes to demonstrate the increased energy capacity in a battery format. We expect to deliver a steady flow of exciting updates at each significant stage as we rapidly push to get our battery technology to market for both electric cars and all electronic devices, from cell phones and computers to power tools.”*

**-ENDS-**

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