



MULTICOM
RESOURCES



Energy you can depend on



FREEDOM
ENERGY Pty Ltd

CUTTING EDGE METALS AND THE FUTURE OF BATTERIES

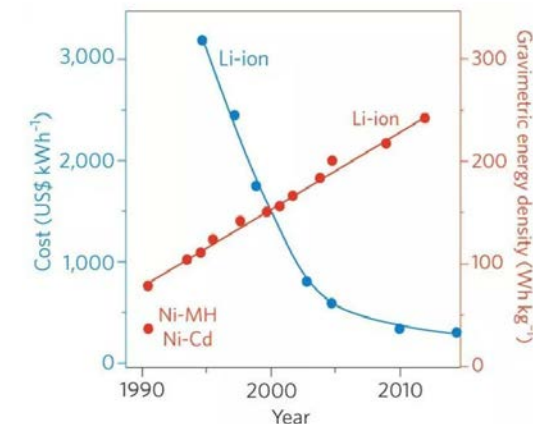
LEAP SUMMIT

4TH JUNE 2019

ENERGY STORAGE & FUTURE OF BATTERIES



- *“In the 21st century, hundreds of millions—and eventually billions—of human beings will transform their buildings into power plants to harvest renewable energies on site, store those energies in the form of hydrogen and share electricity, peer-to-peer, across local, regional, national and continental inter-grids that act much like the Internet.” – Jeremy Rifkin*
- Many different processes exist to convert electrical energy into other forms of energy for storage purposes e.g. pumped hydro, fly wheels, hydrogen and batteries etc.
- Batteries are now increasingly being deployed through novel technologies in much larger, utility scale applications.
- Forecasts of 158GWh of Storage by 2024 (13x increase) with an investment of US\$71B*, increasing to 2800GWh by 2040 requiring investment of US\$620B#
- **What is the path forward:**
 - Selecting the right materials for the right batteries for the right application
 - Reduction in technology costs through increased adoption
 - Integration with existing energy sources and energy markets – innovation and advancement
 - Stable, affordable and sustainable supply of raw materials – **this is where the resource companies get involved**



* Wood McKenzie - "Global Energy Storage Outlook 2019: 2018 Year in Review and Outlook to 2024"

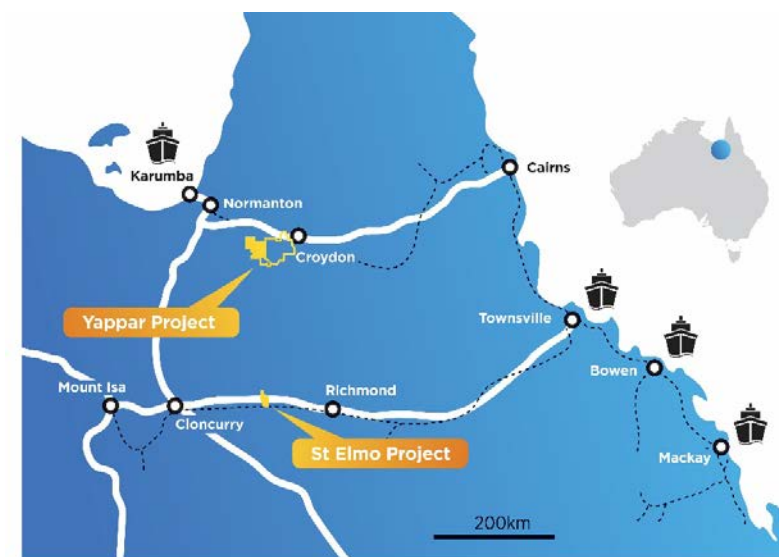
Bloomberg New Energy Finance -

AFFORDABLE SUPPLY – LOW COST PRODUCTION



Multicom Resources Limited

- Privately owned Queensland Company focussed on development of Saint Elmo Vanadium Resource in Julia Creek.
- Currently progressing Environmental Impact Assessment and Mining Lease Approval.
- Pre-feasibility studies near completion.
- **High quality** vanadium pentoxide (V_2O_5) produced through test work.
- Executed LOI's with **strategic offtake partners**.
- Wholly owned subsidiary, Freedom Energy, established for the **energy storage market**.



“Multicom is focussed on the supply of low cost, high quality products to strategic partners in sustainable markets”



STABLE SUPPLY - VANADIUM FUTURE DEMAND DRIVERS



Conventional Demand

- High Strength Steels
- Automotive
- Aerospace
- Pipelines
- Rail
- Buildings/Tunnels/Bridges
- Ships

90% of the current demand is used in steel production.



Emerging Demand

- Further Rebar Regulation
- Vanadium Flow Batteries (VFB)
- Electric Vehicles
- Lithium Vanadium Phosphate Batteries
- Rapidly Industrialising Countries

Between 2017-2025, Vanadium Flow Batteries (VFB) alone are expected to increase vanadium demand by 20%.



Next Generation Demand

- Smart Glass Applications
- Autonomous Vehicles
- Artificial Intelligence Applications
- Robotics
- Quantum Computing

Vanadium compounds are unique. Able to exist as insulators and conductors, the metal is at the forefront of next generation technologies.

RIGHT MATERIALS FOR THE RIGHT APPLICATIONS

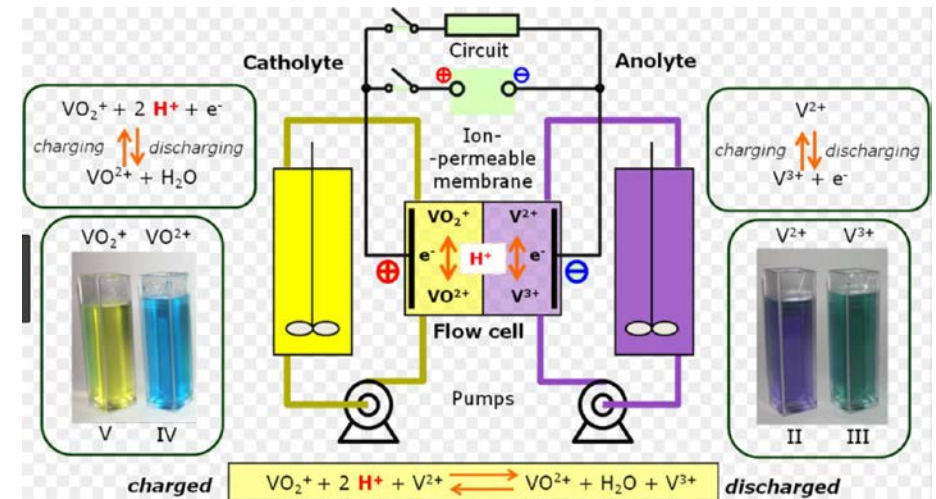
WHY VANADIUM FLOW BATTERIES?

A demonstrated technology with proven fundamentals

- **DURABLE**, 25 yrs or 15,000 cycles
- **NO DECAY**, in capacity over time
- **100% RECYCLABLE**
- **100% REUSABLE ELECTROLYTE**
- **ECONOMIES OF SCALE**, as duration increases

with significant opportunity yet for technology improvement and cost reduction

- **INCREASED POWER DENSITY**
- **INCREASED ENERGY DENSITY**
- **INNOVATIVE COMPONENTS**
- **VOLUME MANUFACTURING**



INNOVATION & ADVANCEMENT - STOREN TECHNOLOGIES

- Multicom & StorEn have entered into an agreement to advance the development and commercialisation of StorEn's Vanadium Redox Flow Batteries.
- Some facts on StorEn's batteries:
 - Designed to deliver superior performances at a lower cost;
 - Very low cost per cycle, eight times lower than lithium-ion batteries; and
 - Battery life of 25 years
- StorEn's first full scale prototype currently installed at Stony Brook University (NY) with additional prototypes being manufactured for distribution to Multicom in Australia.



StorEn's residential battery can be charged and discharged at up to a constant power of 5kW (with maximum peak power of 6kW) and provides 30kWh of energy (6hrs discharge at full power).

A PATH FORWARD - VERTICAL INTEGRATION FOR SUCCESS

Low cost 10 years supply of V205 to StorEn.

Battery units to be manufactured under JV.

Freedom Energy has **exclusive distribution** rights across the Asia Pacific.

Mechanism for Multicom to **acquire equity** in StorEn and vice versa.



Mine

Assembly, Sales &
Distribution

IP and Component
Manufacture

CURRENT AREAS OF COLLABORATION

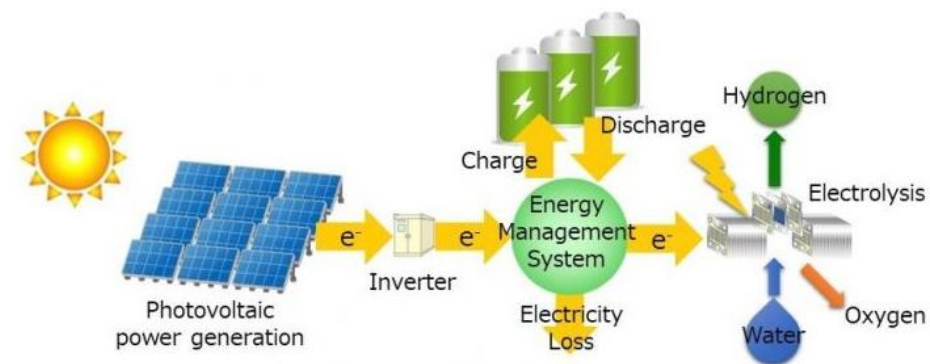
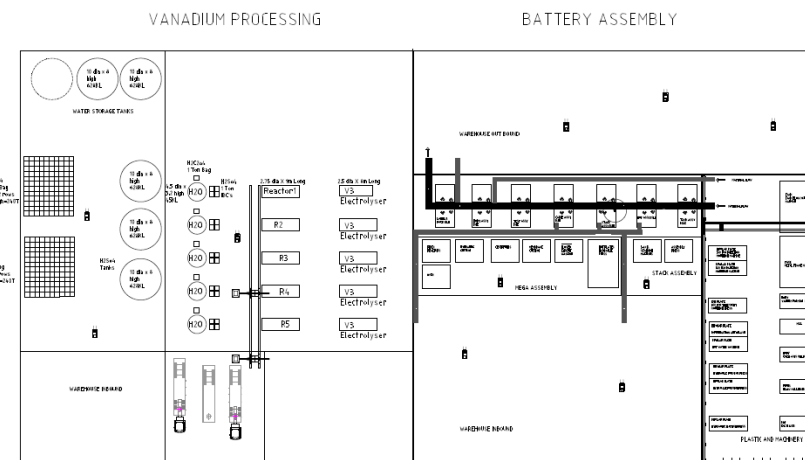
- Preparing for delivery of first StorEn battery in Australia. Due for delivery in June 2019.
- Conceptual design of battery manufacturing facility complete. Working with Downer Group on scope for next level feasibility studies.
- MOU in place with one of Queensland's largest residential developers.
- Currently negotiating MOU with an interstate energy provider regarding further areas of collaboration.



- **2,000 Powerwall™** batteries installed and **networked**
- Their **cost was subsidized** by GMP
- Households paid **\$1,500 + \$15 per month** (for 10 years)
- **\$8M invested** by GMP
- **Access to batteries' capacity** granted to GMP to stabilize the grid and shave peaks

ACTIVELY PURSUING RESEARCH AND DEVELOPMENT

- Queensland Industry Representative and Founding Steering Committee for the recently approved (10th April 2019) Future Battery Industries Co-operative Research Centre.
- Affiliate Partner in the QUT Hydrogen Process Research and Development funded by ARENA.
- Currently exploring options with the Innovative Manufacturing Cooperative Research Centre to fund battery manufacturing facility development work



NEXT PHASE OF RELATIONSHIP DEVELOPMENT

- Identify locations and partners for next two trial batteries to be delivered to Queensland by end of 2019.
- Advance discussions with additional utility providers.
- Advance discussions with telecommunications providers.
- Initiate next phase of feasibility studies with Downer Group.
- Progress discussions with Townsville City Council regarding land options regarding manufacturing facility.



QUESTIONS AND FURTHER DISCUSSION

