Integrated Vanadium Supply
Infinite Clean Energy

VANADIUM REDOX FLOW BATTERY
100% Green, proven technology
Low Cost Energy Storage target
With VanadiumCorp Electrolyte™

VANADIUMCORP ELECTROLYTE™
42% cost component of the VRFB
100% Reusable battery material
No domestic/low global supply

VE PROCESS TECHNOLOGY
Breakthrough direct technology
100% Green and scalable
Max recovery without heat (V, Fe, TiO₂)
Complete Solution

VANADIUMCORP ELECTROLYTE™
THE LOW COST ENERGY STORAGE SOLUTION

PRIMARY HIGH PURITY SUPPLY
- NI 43-101 vanadium resources
- 100% ownership, Quebec, Canada
- Favorable infrastructure & access

MOST EFFICIENT PROCESS
- No smelter or roasting required

VANADIUM REDOX FLOW BATTERY
- 100% Green, proven technology
- Low Cost Energy Storage with VanadiumCorp Electrolyte™

IMMEDIATE COST REDUCTION
- Vision of world's 1st Primary VE supply

VE PROCESS TECHNOLOGY
- Breakthrough direct technology
- 100% Green and scalable
- Max recovery without heat (V, Fe, Ti)

EXCLUSIVE MARKET OPPORTUNITY
- Global supply shortage
- Undeveloped Canadian resources
- Ultimate solution for renewable clean power
- Strong demand for HSLA steel and aerospace

VANADIUM CORP ELECTROLYTE™
- 42% cost component of the VRFB
- 100% Reusable battery material
- No domestic/low global supply
Supply-Technology Paradox Solved

Vanadium Electrolyte Cost

Current Disruptive Sources

Local Supply Direct Process

Vanadium Redox Flow Battery “VRFB”

Current Disruptive Sources

Local Supply Direct Process

$/kWh

$/kWh

$/kWh

$/kWh

$/kWh

$/kWh

$/kWh

$/kWh

$/kWh
Vanadiumcorp vision

**Magnetite Concentrate “VTM”**
Extraction/concentration

**Multiple Vanadium & Iron Bearing Feedstocks**
Slags, copperas, flyash waste and calcine

**Vanadiumcorp Electrolyte™**, Electrolytic iron & Titanium Co-products

Exclusive Green Process Technology
Corporate Overview

Primary projects
- Lac Dore NI 43-101 Vanadium-Iron-Titanium Inferred Resource
  - 621,214,000 LBS V$_2$O$_5$ in VTM concentrate
  - Concentrate grade above global production average (1.08% V$_2$O$_5$)
- VanadiumCorp-Electrochem Technology – Commercialization and licensing objective

Strategic advantages
- Vertically integrated direct processing technology for multiple feedstocks
- North American market & favorable jurisdiction (Quebec, Canada)
- Global licensing and supply opportunity
- Size, grade, quality, access & infrastructure
- 100% owned assets – Offtake ready

People
- Experienced & invested management
- Industry leading technical team
- Strong shareholder representation (+80%)
- Community and government support

Alliances and consultants
- Mitacs
- ios services géoscientifiques
- Government of Canada
- Canada
- COREM
- METCHIB
- C-Tech Innovation
- SCHMID
Low Cost Energy Storage Supercharged

VanadiumCorp Electrolyte™

Proven Technology

Strategic Supply & Exclusive Processing Technology

Grid level energy storage

Cost reduction and battery life potential
SECURING DISRUPTIVE TECHNOLOGIES
• Co-ownership (50%-50%) for the new patent pending technology for converting efficiently VTM into VE without slagging, smelting and roasting.
• Fully integrated approach with the subsequent valorization of iron using exclusive Electrochem Technologies & Materials Inc. patented iron electrowinning technology now enforced in Canada and global jurisdictions.

COST EFFICIENT & RAPID TESTING CAPABILITIES
• Electrochem’s comprehensive in-house testing capabilities allowing the rapid, cost efficient and strictly confidential testing of the fully integrated process without disseminating the know-how across various R&D entities.

STRONG VANADIUM METALLURGY EXPERTISE
• Benefits from extensive Electrochem's metallurgical and chemical know-how and expertise regarding the processing of vanadium from various feedstocks including the possibility to compare with benchmarks using the conventional processes.

CONSERVATIVE INDUSTRIAL APPROACH
• Conservative step-by-step approach: laboratory screening tests, prototype tests, semi-pilot testing with each milestones backed by additional basic engineering calculations and preliminary costs and benefits analysis to support decision towards future implementation.

SHARING OF INDUSTRIAL PARTNERS
• Allowing the identification of key financial, engineering and industrial partners.

LICENSING THE NEW TECHNOLOGIES OUTSIDE CANADA
• Allow bring cash flow for both companies by licensing their technologies outside Canada
• Disruptive technology for phasing out blast furnace for iron making, roasting for vanadium production or enhancing existing operations.
VanadiumCorp-Electrochem Technology

Simple Mining/Extraction -to- VTM Concentrate

VTM Concentrate -to- Vanadium solution

Electrowinning of iron and recycling of products

V₂O₅, V₂O₃, VanadiumCorp Electrolyte™

Titanium dioxide Co-products

VanadiumCorp Resource Inc.
VanadiumCorp Resource Inc./Electrochem Technologies & Materials Inc.
Electrochem Technologies & Materials Inc.
VanadiumCorp Resource Inc./C-Tech Innovation

VanadiumCorp Resource Inc. Resource Inc.
VanadiumCorp Resource Inc./Electrochem Technologies & Materials Inc.
Electrochem Technologies & Materials Inc.
VanadiumCorp Resource Inc./C-Tech Innovation

All produced commodities property of VanadiumCorp, technology and patent partnerships are subject to terms and conditions agreed by disclosed parties. Stock photos above are for illustration purposes only. VanadiumCorp Electrolyte™ is a registered trademark of Vanadiumcorp Resource Inc.
Magnetite “VTM” Production Comparison

**VanadiumCorp-Electrochem Technology**

**Source materials** – VTM concentrate & fly ash waste, slags, calcine, copperas feedstocks

100% Green

Max Recovery +95% of VTM

Consumables - Acid +

Power Source – Low cost Quebec hydropower

Products +98% Iron, Vanadium and Titanium

Focus – Lowest pricing VanadiumCorp Electrolyte™ (100% reusable battery electrolyte)

Scalable - Modular design and flexibility scaled to supply size or market demand

Location requirement - Industrial park or similar

CAPEX – $TBA

**Conventional Salt Roasting “Primary Production”**

**Source materials** - VTM

Calcine waste (All Iron credits lost) & GHGs from coal and gas burning

CO₂

Low Recovery – 0.5-1% average from concentrate

Consumables – Coal, soda ash,

Power Source – Coal, gas, electricity

Products 98% V₂O₅ average

Focus – V₂O₅ (impurities typically disregarded)

Average 600K-1M tpa VTM Scale - Mine, mill, concentrator, rotary kiln

Location requirement – Infrastructure & dedicated power close to resource

CAPEX- $350M-$1B+USD depending on location, metallurgy, access, infrastructure and more

**Conventional Smelting “Co-Production”**

**Source materials** – VTM, Hematite

GNG from coal and gas burning

CO₂

Limited Recovery – pig iron, and vanadium and titanium in slags

Consumables Coal, gas,

Power Source – Coal, gas, electricity

Products – Iron & vanadium titanium slag

Focus – Iron recovery for steel

Significant scale – Mine, mill, concentrator, pre-reduction plant and smelter

Location requirement – Infrastructure & dedicated power close to resource

CAPEX- ~$1B-$2B USD depending on location, metallurgy, access, infrastructure and more

Stock photos above are for illustrative purposes only, VanadiumCorp Electrolyte™ is a registered trademark of Vanadiumcorp Resource Inc.
Sustainable Vision and Objectives

Green Project
❖ Low cost Quebec hydropower, commitment to maximize electrification

Green power
❖ Canadian renewable & VRFB deployment

Green processing technology
❖ Breakthrough direct process uses no heat

Green Battery Material
❖ Infinite use- vanadium is 100% reusable

Green Technology - VRFB
❖ Energy never degrades, simple management, highest safety, 25+ year life

Green Climate change solution
❖ Low cost energy storage made possible by Canadian oil sands waste, steel waste and exclusive primary vanadium resources in Quebec
VanadiumCorp Electrolyte™ From Fly Ash Waste

Recovery and transformation of VanadiumCorp Electrolyte™ from vanadium bearing fly ash waste from the Canadian oil sands

VanadiumCorp is developing the leading process technologies

- VanadiumCorp-Electrochem Processing Technology ™
- Electrochem globally patented Electrowinning
Management

Adriaan Bakker
President & Chief Executive Officer
14 years experience in mineral resource development and battery materials in the public and private sectors. Project acquisition/management/finance, marketing and M&A.

Stephen Pearce
Chief Financial Officer & Corporate Secretary
Law degree from the University of British Columbia and an Honors Bachelors Degree in economics from York University with an emphasis on corporate finance. Mine management, current corporate and securities law focus.

Paul Sorbara
M.Sc., P. Geo & Director
Designation of Professional Geologist received in 1991 from the Association of Professional Engineers and Geoscientists of British Columbia. In 1985, the Geological Association of Canada awarded him the designation of Fellow of the Geological Association of Canada.

John Hewlett
Director
Strategic investor in the resource market for over 30 years
Project management and development
VanadiumCorp Electrolyte™ Technical Team

**Terry Perles - Vanadium Sales & Marketing**

The world’s leading vanadium authority and former VP global sales for Stratcor & EVRAZ. Through his managed company’s, TTP Squared Inc. and MoTiV Metals LLC, he handles global sales and marketing for the leading producers of vanadium, molybdenum & titanium worldwide.

**Dr. Maria Skyllas–Kazacos - Professor Emeritus & Scientific Advisor**

Inventor of the Vanadium Redox Battery (VRB,VFB,VRFB) technology now commercialized in China, Japan, Europe, Korea and North America. Dr. Maria is currently pioneering Generation 2 VRFB and Vanadium Oxygen Redox Fuel Cell technology at the University of New South Wales, Sydney, Australia.

**Dr. Gilles Champagne - Electrochemical Engineer and VRFB Specialist**

Over 25 years' experience driving innovations to market and has held several positions in mature and early-stage companies in Canada, the US and Europe, structuring organizations, directing technical activities and managing teams that develop and build energy storage products and analytical equipment. Former VP Engineering and Development at Imergy Power Systems Inc. in Silicon Valley, which was developing a unique high efficiency, stationary energy storage battery using innovative vanadium "V/V" flow battery technology. Under his leadership, Imergy delivered its first commercial shipment of vanadium based ESP units to India Telecom customers.

**Dr. Ron Molnar – Vanadium Electrolyte Process Specialist**

35 years experience in hydrometallurgical bench and pilot plant testing. He is a solvent-extraction specialist. Dr. Molnar is a life member and fellow of CIM. He has designed, built and operated over 60 pilot plant circuits (including Lac Dore) extracting a wide range of metallic elements. Dr. Molnar is an author and a consultant within the field of solvent extraction and ion exchange process testing and development.
Primary Project Technical Highlights

Size, grade, & unrivaled quality

- NI 43-101 vanadium resource
- 99.1Mt @ 0.43% V₂O₅ inferred
- 621,214,000 million lbs *1.08% V₂O₅
- P2 Zone – Up to *2% V₂O₅
- 95% recovery from concentrate
- Spans 45km²
- Open at depth and along strike
- Favorable metallurgy
- 2002 SGS Pilot plant achieved 99.9% V₂O₅ Vanadium Electrolyte

Location

- Mining friendly Quebec, Canada
- 30 minute drive from established mining center
- Adjacent to mine permitted project (non NI 43-101, ½ wide extension of VanadiumCorp)
- Available highway, road, CN railway, 161KV power, water, cellular & workforce

*In magnetite concentrate samples
Rich History of Lac Dore Vanadium Project

Former Quebec government project

2002 Pilot plant achieved
99.9% Vanadium Battery Electrolyte

9 Resource estimates & extensive metallurgical testing

East Deposit 54 Drill holes

35 Channel trenches
Infrastructure

Road access and mining town
35km south-west of Chibougamau, Québec, Highway 167 access

Power (161 kV)
Proposed substation approved (Blackrock) (1.5 km South of Lac Dore)

Railway
25 km to CN Rail head, rail spur approved for Blackrock

Saguenay Rail & private port
Construction and port upgrade in 2015 (Blackrock)
Strategic Resource & Exclusive North American Market

2002 Pilot Plant Production
SGS Lakefield, Lakefield Ontario, 99.99% VE utilized by Sumitomo

Best Jurisdiction
Quebec, Canada

World class high purity
Vanadium resource

Quality Positive metallurgy

Low impurity profile
Required by VRFB technology

Vision for 2017 Pilot Plant
Chibougamau Region

James (Jim) A. MacLeod – Regional and Cree First Nations advisor

President of J.A. MacLeod Exploration and EnviroCree Ltd and regarded as a leading mining exploration technologist. Founder of the Mistissini Geological Resources Centre and former Mistissini chief of police. Jim works closely with aboriginal communities as a consultant on projects and training in mining exploration.
Potential: Worlds 1st Dedicated VE Producer

VanadiumCorp

The only Company with a mandate to secure long term stable supply agreements at a significant discount to existing market

Ultimate energy storage meets Vanadiumcorp Electrolyte™ (VE)
Immediate cost/kWh reduction possibility with low cost production target

Infinite Mine Model
Unique ability to reuse 100% green Vanadium Electrolyte™ in a VRFB lowers $/kWh and creates an inexhaustible reserve bank of vanadium

China is demonstrating the value of lower cost, stable domestic v supply
3000 mWh VRFB plans in Dalian announced April 2016 by Rongke/UniEnergy

Real Solution for Climate change - VRFBs are outpacing Lithium in grid storage for renewable power, replacement of diesel generators and load leveling

Creation of an exclusive market
Costly conversion from steel and oil byproducts and unstable foreign supply would become obsolete
Other Vanadium Applications

Energy Storage
- Vanadium Electrolyte (VE)
- Grid scale vanadium redox battery (VRFB)
- Lithium-vanadium based battery for electric vehicles

Steel Alloy
- High strength low alloy steel (HSLA)
- High Carbon steel alloys (HSS)
- Rebar and structured beams
- High speed tools and surgical instruments

Titanium alloy
- Ti-6Al-4V in airframes, jet engines and personal transports
- Dental implants

Chemicals
- Catalysts for sulfuric acid and synthetic rubber production
- Critical component in catalytic converter to remove sulfur dioxide
- NOx catalysts
- Vehicle catalyst alternative for platinum and nickel

Energy Storage
- Vanadium Electrolyte (VE)
- Grid scale vanadium redox battery (VRFB)
- Lithium-vanadium based battery for electric vehicles
High Purity Vanadium Critical for Aerospace

Titanium alloy Ti 6-4 is the fastest growing segment within aerospace containing 4-6% high purity vanadium.
Unrivaled Steel Strengthener

“Green” metal most utilized in steel industry

1 Kilogram Vanadium × 1 Tonne Steel = 2X Strength

Highest strength to weight ratio of any alloy

- Vanadium reduces environmental impact and lowers capital requirements. Just 0.05% in steel can double yield strength and decrease structural weight by 30-40%.
- 92% of global vanadium production utilized in high-strength low alloy (HSLA) steels.
- 6.2% CAGR demand increase since 2005 from increasing steel standards & environmental mandates
Current Supply Limited - Unstable Supply Sources

Only a small fraction of global resources meet the requirements of the high purity markets

❖ No primary supply of VE or long term supply contracts exist for VE
❖ Disruptive (secondary source) VE supply positions VRFBs at higher cost/kWh

High Purity VE Supply

Secondary Source VE Suppliers

- Evraz – Stratcor
- Riverside Specialty Chemicals
- Oxkem Limited
- GFE - AMG
- Vanchem
- Dalian Bolong

VRFBs use vanadyl sulfate $\text{VSO}_4$ as basis for their electrolyte and require a very low contaminant level in the soluble vanadium compound, notably for silica ($<10 \, \mu\text{g/l}$) and sodium ($<100 \, \mu\text{g/l}$), for an overall 99.99% purity.
Production & Consumption Forecast

Assumes: Demand growth in traditional markets 6% CAGR

MTV/yr


Steel/Ti/Chemicals  VRB  Li Ion

TTP Squared, Inc.
Production prospects cannot meet forecast demand

Assumes:
Demand growth in traditional markets 6% CAGR
Supply growth of 12,000 MTV/yr with restart of Chinese stone coal mines and Windimurra
Increasing Use in Energy Storage

Grid Level Vanadium Redox Battery Consumption of Vanadium

Cumulative Vanadium Consumed MTV


TTP Squared, Inc.
Vanadium Consumption in Energy Storage

- 2011: 1000 MTV/yr (VRB)
- 2012: 2000 MTV/yr (VRB)
- 2013: 3000 MTV/yr (VRB)
- 2014: 4000 MTV/yr (VRB)
- 2015: 5000 MTV/yr (VRB)
- 2016 Fcst: 7000 MTV/yr (VRB, Li Ion)
- 2017 Fcst: 8000 MTV/yr (VRB, Li Ion)
- 2018 Fcst: 9000 MTV/yr (VRB, Li Ion)
- 2019 Fcst: 10,000 MTV/yr (VRB, Li Ion)
- 2020 Fcst: 25,000 MTV/yr (VRB, Li Ion)

TTP Squared, Inc.
Demand for vanadium in traditional applications is projected to grow at a CAGR of 6% per year through 2020 as a result of moderating growth rates in global steel production and ongoing substitution of C-Mn steel with vanadium bearing HSLA steels.

The liquidation of Highveld Steel in South Africa has fundamentally changed the vanadium market balance. Current demand is ahead of production and global inventory levels are decreasing. Recently vanadium prices have begun to react to the tightening market conditions and prices are moving back towards historical norms after two years of very weak prices. There is the possibility of a near term vanadium price spike.

Energy storage applications have the potential to increase global vanadium consumption by more than 27,000 MTV per year or more than 30% of the current market by 2020.

In the near term there are limited potential new sources for vanadium and the existing supply base is threatened by the Chinese steel industry instability at this time.

Longer term new vanadium primary mines will be necessary to supply growing vanadium market needs.

TTP Squared, Inc.
Vanadium Redox Battery “VRFB”
With Cost Reducing VanadiumCorp Electrolyte™

25-50 YEAR LIFETIME
Technology endures a full lifetime unlike competing technologies
Infinite life VanadiumCorp Electrolyte™

LONG RUNTIME
Storage solution supports 8-10 hour runtimes, supporting the majority of grid applications.

MAINTAINS CAPACITY
Unlike conventional long term batteries, charge doesn't degrade over time
Vanadium is 100% Reusable.
“The forever battery” - Unique chemical properties

One ingredient: Vanadium

Multiple oxidation states V $^{+2,+3,+4,+5}$

Most batteries degrade over time from contamination of different elements

Vanadium is **both** the cathode (-) and anode (+) in VRFB technology

Vanadium does not degrade
A vanadium redox flow battery (VRFB) is a type of rechargeable flow battery where rechargeability is provided by vanadium electrolyte (VE) dissolved in solution.

Two tanks of VE, one side containing $V^{2+}$ and $V^{3+}$ ions, the other side containing $V^{4+}$ and $V^{5+}$ ions, are separated by a thin proton exchange membrane. Pumps on both sides circulate the electrolyte.

Electron differential between the two cells generates electric power.

No cross-contamination like most batteries
Electrolyte in the catholyte and the anolyte consists of 100% vanadium ions. The ion sensitive membrane separating both sides of the electrolyte tank allows only protons to pass.
Evolution of the VRFB

Invention of VRFB
1st patent at UNSW

1986
UNSW patent sold to Australian Pinnacle

1996
450 kW / 900 kWh battery installed in Japan by Sumitomo

1998
1st flow batteries developed by NASA for use on missions (Iron-Chromium)

1970

2005
4 MW / 6 MWh battery installed in Japan by SEI

2006
Patent expires, allowing companies to explore VRB technology

2009
Bolon Dalian becomes global VE producer

2002
Lac Dore Pilot Plant Produces 99.9% Electrolyte

2013
~$250M USD Commercial VRB Launch

2015
Sumitomo installs 60MW VRB Hokkaido, Japan

2016
Rongke Power Starts construction of 3000MWh VRFB

2010
Generation III Breakthrough

2013
Bolon Dalian becomes global VE producer

2009
VRB Power Acquires Global Patents to the VRB Technology

2006

UNSW patent sold to Australian Pinnacle

1986
UNSW patent sold to Australian Pinnacle

1970
1st flow batteries developed by NASA for use on missions (Iron-Chromium)

1986
450 kW / 900 kWh battery installed in Japan by Sumitomo

1998
1st flow batteries developed by NASA for use on missions (Iron-Chromium)

1970
1st flow batteries developed by NASA for use on missions (Iron-Chromium)
### Vanadium VS. Lithium

**The Supply Solution for Grid Storage**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Vanadium</th>
<th>Lithium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cycles (Lifespan)</td>
<td>Indefinite</td>
<td>~300 Max (3-5 yrs)</td>
</tr>
<tr>
<td>Suitable for Grid Scale Storage &amp; Load Leveling</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Efficient Storage for Solar &amp; Wind Power</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>No Risk of Fire or Explosion Due to Overheating</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Scalable to Meet Unlimited Range of Storage Capacity</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Charges &amp; Discharges Simultaneously</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Battery Solution Can be Used &amp; Re-Used Indefinitely</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Low Discharge Rate &amp; Thermal Runaway</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Can Release Energy Instantaneously</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Storage Ability Does Not Degrade Over Time</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Reduced Cell Management/Monitoring With Increasing Scale</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>Low Environmental Footprint</td>
<td>✔️</td>
<td>✘</td>
</tr>
<tr>
<td>High Energy Density &amp; Short Life</td>
<td>✘</td>
<td>✔️</td>
</tr>
<tr>
<td>Ability to Meet the Energy Storage Requirements Anticipated in the Future</td>
<td>✔️</td>
<td>✘</td>
</tr>
</tbody>
</table>
VanadiumCorp Scientific Advisor

- Graduated from UNSW with an Industrial Chemistry Engineering degree in 1974
- Completed her PhD in 1978 at the UNSW School of Chemical Technology.
- Awarded the Royal Australian Chemical Institute’s Bloom-Gutmann prize
- Filed first patent for all Vanadium Redox Flow Battery in 1986
- The Vanadium Redox Battery (VRFB) is regarded internationally as one of the most feasible energy storage technologies available. The battery helps reduce fossil fuel consumption and greenhouse gas emissions by meeting the growing need for efficient renewable energy storage.

“Achieving cost reduction is a big focus now. There are many different ways of doing it in the scientific sense – not only with cheaper, lower-cost materials but also improving the performance of batteries.”

Maria-Skylas-Kazacos
Immediate cost reduction opportunity - Local v v supply

- Lithium Battery: ~3% Cost (Contained Lithium)
- Vanadium Redox Battery: ~42% Cost (Contained Vanadium)

Many primary producers

Disposable
Ideal for smaller applications

No primary production

100% Green Battery
Ideal for larger applications
Vanadium is referred to as the "the electric metal" for its bright future in energy storage and green technology.

The National Research Council in Canada is completing a vanadium market study with the objective of presenting a business case for Canadian primary vanadium production.

**Future projects may include:**

- Vanadium Electrolyte Research & Development
- Cost reduction of VRFB electrolyte and components
Technical advantages of the VRFB

- **Single function of the electrodes** Separation of power and energy
  - **VS** Dual Function for Lithium Ion & Metal Air

- **Long life** 25+ years with almost unlimited cycles (>20,000), $/kWh decreases as duration increases

- **Scalable** Simply increase the size of electrolyte tank

- **No cross contamination** One battery material: vanadium

- **100% reusable** VanadiumCorp Electrolyte does not degrade

- **Holds energy indefinitely** No heat or thermal runaway

- **100% depth of discharge** Without affecting cycling life

- **(Highest safety rating)** No overheating or possibility of fire or explosions

- **High energy conversion efficiency** Best for storing renewable energy

- **Simple management and maintenance** (no small battery cells) Flexible temperature range suitable for most climates

- **Tolerance to over-charge/discharge** Important for storing renewable energy

- **High round trip efficiency** Can be as high as 90%

- **Proven and reliable technology** Over 30 years of development, research and commercial deployment
Significant Market Opportunity

Renewable
- Enhance Renewable Energy
- Increasing penetration of renewables is carving into base-load and destabilizing the grid

Generation
- Optimize Base-Load Generation
- Japan, Germany & US are retiring Nuclear and Coal, increasing reliance on renewables

T&D
- Defer T&D Capital Investment
- Increasing stress on grid infrastructure is driving need for additional capital investment

C&I
- Lower Cost & Increase Reliability
- Increasing Time of Use (TOU) Rates, Demand Charges, and on-site renewables are driving up utility costs

Microgrid
- Provide resilience & lower cost energy
- Increasing use of renewables in microgrids require a balancing resource

Long duration energy storage markets to grow to $13 billion by 2018 and over $20 billion per year by 2020

Utilities in the USA have issued requests for over $5 billion in energy storage

Sources: Pike Research, Navigant Consulting
VRFB Technology is Mature

- Developed over 30 years, in operation over 17 years. 100’s of commercial grid-scale systems deployed globally. Demonstrated durability and reliability.

- Notably, the largest battery in construction is 3000MWh in capacity. (100X larger than the largest Lithium installation)
Tipping point for long duration storage

3000MWh VRFB Announced May 2016
Beijing's air is the equivalent to smoking **FORTY** cigarettes a day

Air pollution kills 4,000 a day in China
The Ontario government states “a large, diesel-powered community produces more than 10,000 tonnes of carbon dioxide a year.

Market Opportunity
Globally, the remote microgrids market is currently worth an estimated $2.4 billion, and is expected to increase to more than $10 billion annually by 2024, at a compound annual growth rate (CAGR) of 17.4%.

Global shift
Around the world, remote villages and communities are beginning to transition to clean power with utility based solutions and renewable energy.
Volkswagen is investing around 600 million Euros in renewable energies with which it intends to reduce CO2 emissions from the plants’ energy supply by 40%.

World 1st E-station in Germany is completely independent from the electricity grid and consists of a solar PV system, a wind turbine and a vanadium redox flow battery.
Climate change
Clean Energy Vision

Battery Storage

Electrical & Thermal Storage

Combined Heat & Power

Community Solar PV

Rooftop Solar

Microgrids

Demand Response

(100% Green Charging Station)
Disclaimer

THIS DOCUMENT IS STRICTLY CONFIDENTIAL AND IS BEING PROVIDED TO YOU SOLELY FOR YOUR INFORMATION BY VANADIMCORN RESOURCES INC. (THE “COMPANY”) AND MAY NOT BE REPRODUCED IN ANY FORM OR FURTHER DISTRIBUTED TO ANY OTHER PERSON OR PUBLISHED, IN WHOLE OR IN PART, FOR ANY PURPOSE. FAILURE TO COMPLY WITH THIS RESTRICTION MAY CONSTITUTE A VIOLATION OF APPLICABLE SECURITIES LAWS.

This presentation does not constitute or form part of, and should not be construed as, an offer to sell or issue or the solicitation of an offer to buy or acquire securities of the Company or any of its subsidiaries nor should it or any part of it, not the fact of its distribution, form the basis of, or relied on in connection with, any contract or commitment whatsoever. This presentation has been prepared by, and is the sole responsibility of, the Company. This document, any presentation made in conjunction herewith and any accompanying materials are for information only and are not a prospectus, offering circular or admission document. This presentation does not form a part of, and should not be construed as, an offer, invitation or solicitation to subscribe for or purchase, or dispose of any of the securities of the companies mentioned in this presentation. These materials do not constitute an offer of securities for the sale in Canada, the United States or elsewhere or an invitation or an offer to the public or form of offer or commitment whatsoever. The information contained in this presentation has not been independently verified. No representation or warranty, express or implied, is made as to, and no reliance should be placed on, the fairness, accuracy or completeness of the information or the opinions contained herein. The Company and its advisors are under no obligation to update or keep current the information contained in this presentation. To the extent allowed by law, none of the Company or its affiliates, advisors or representatives accept any liability whatsoever (in negligence or otherwise) for any loss howsoever arising from any use of this presentation or its contents or otherwise arising in connection with the presentation. Certain statements in this presentation constitute forward-looking statements, including statements regarding the Company’s financial position, business strategy, plans and objectives of management for future operations. These statements, which contain the works “believe”, “expect”, “anticipate”, “intends”, “estimate”, “forecast”, “project”, “will”, “may”, “should”, “could”, and similar expressions, reflect the beliefs and expectations of the management board of directors of the Company and are subject to risks and uncertainties that may cause actual results to differ materially. These risks and uncertainties include, among other factors, the achievement of the anticipated levels of profitability, growth, cost and synergy of the Company’s recent acquisitions, the timely development and acceptance of new products, the impact of competitive pricing, the ability to obtain necessary regulatory approvals, and the impact of general business and global economic conditions. These and other factors could adversely affect the outcome and financial effects of the plans and events described herein. Neither the Company, nor any of its respective agents, employees or advisors intend or have any duty or obligation to supplement, amend, update or revise any of the forward-looking statements contained in this presentation. The information and opinions contained in this document are provided as at the date of this presentation and are subject to change without notice. This document has not been approved by any competent regulatory or supervisory authority.
Tier I Issuer listed on the Toronto Stock Exchange: Stock Symbol “VRB”

Shares issued: 206.8 Million

www.vanadiumcorp.com

Suite 400 - 1505 West 2nd Avenue Vancouver, British Columbia, V6H 3Y4, Canada

Business Development
Mrs. Arbe Myhre
Phone: 604-385-4481
Fax: 604-385-4486
Email: am@vanadiumcorp.com