



ENABLING THE SHIFT TOWARDS THE ECONOMY OF ELECTRICITY

>>>

THE ENERGY OF THE 21ST CENTURY

Advanced Energy Conference
March 2018

Overview



StorEn is an energy storage company with a transatlantic development team, based at CEBIP at Stony Brook University



Our All Vanadium Flow Batteries (VFBs) based upon:

- **proprietary IP, and**
- **an innovative design philosophy**

Dedicated VFB Energy Modules for financially-viable applications, such as power continuity

Mission



Building upon the proven fundamentals of the All Vanadium flow technology, designing **Cost Effective** Energy storage Modules



Energy Storage Market Growth



28-fold Growth

in the next 10 years



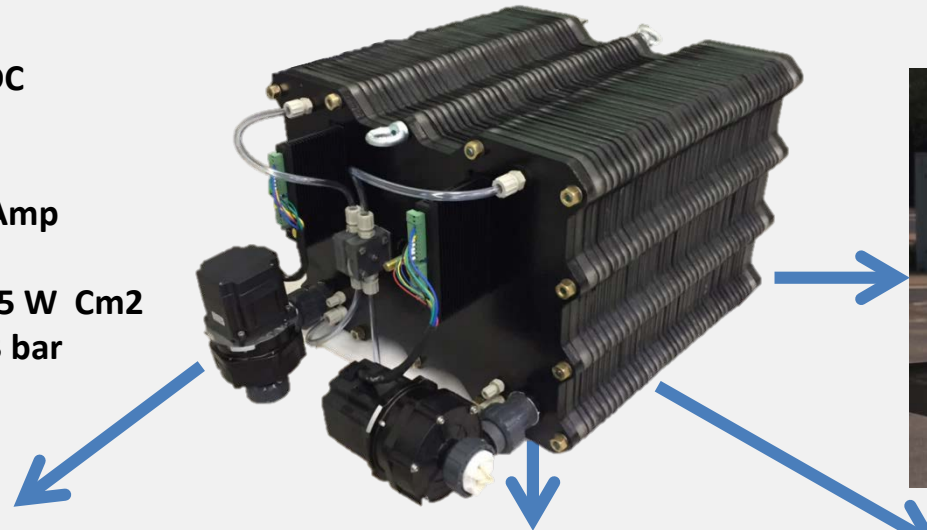
Source: Navigant Research - May 9th, 2017

Our Technology



STACK PARAMETER

NOMINAL VOLTAGE **48 VDC**
NOMINAL POWER **5 kW**
PEAK POWER **8 kW**
NOMINAL CURRENT **100 Amp**
MAX CURRENT **320 Amp**
MAX POWER DENSITY **0,65 W Cm2**
OPERATING PRESSURE **0,3 bar**
FLOW RATE **60 lt/min**



500 kWh ESS



25 kWh OUTDOOR



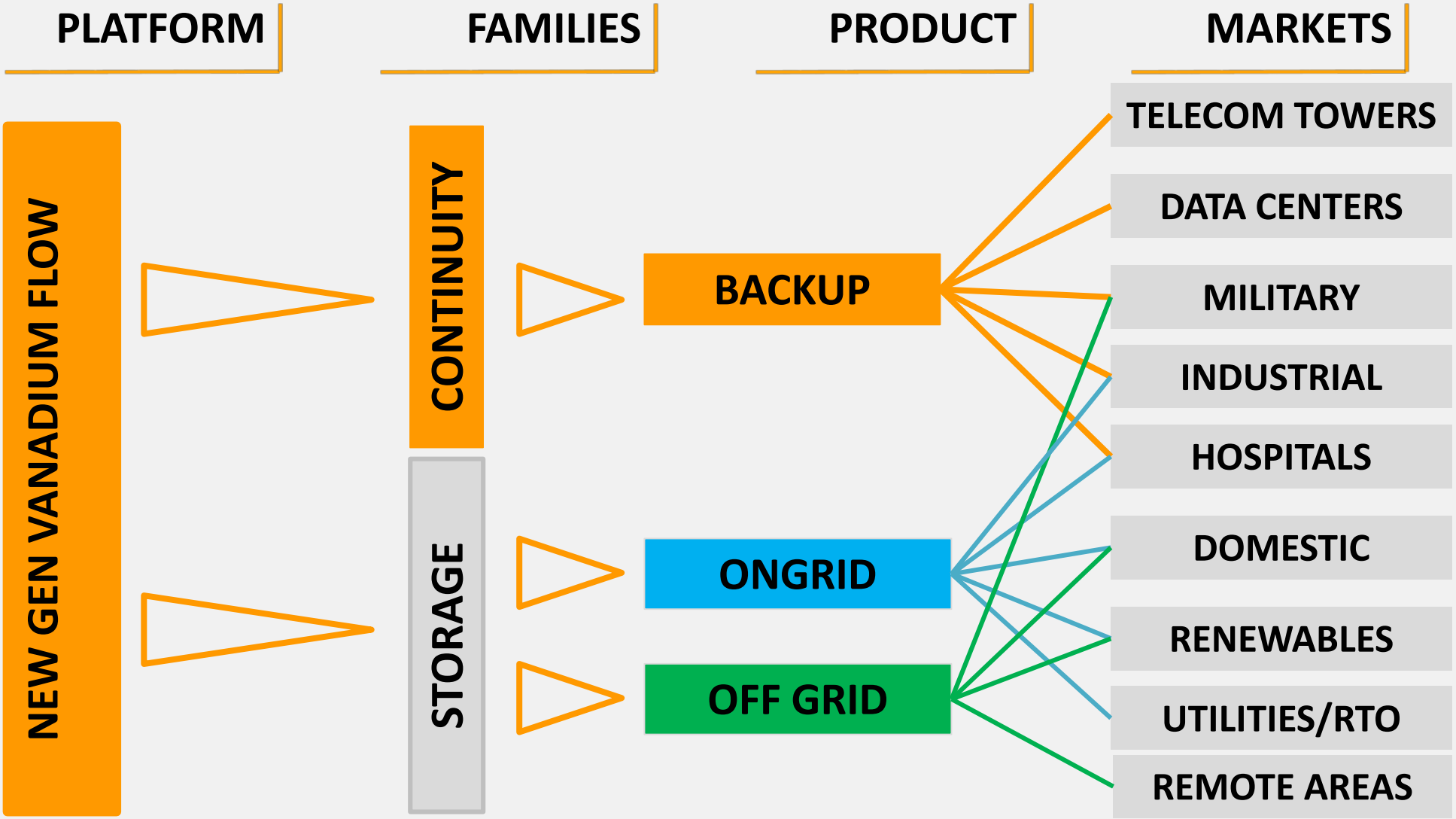
30 kWh UNDERGROUND



20 kWh INDOOR



Target Applications





Why Vanadium Flow - Our IP



A PROVEN TECHNOLOGY

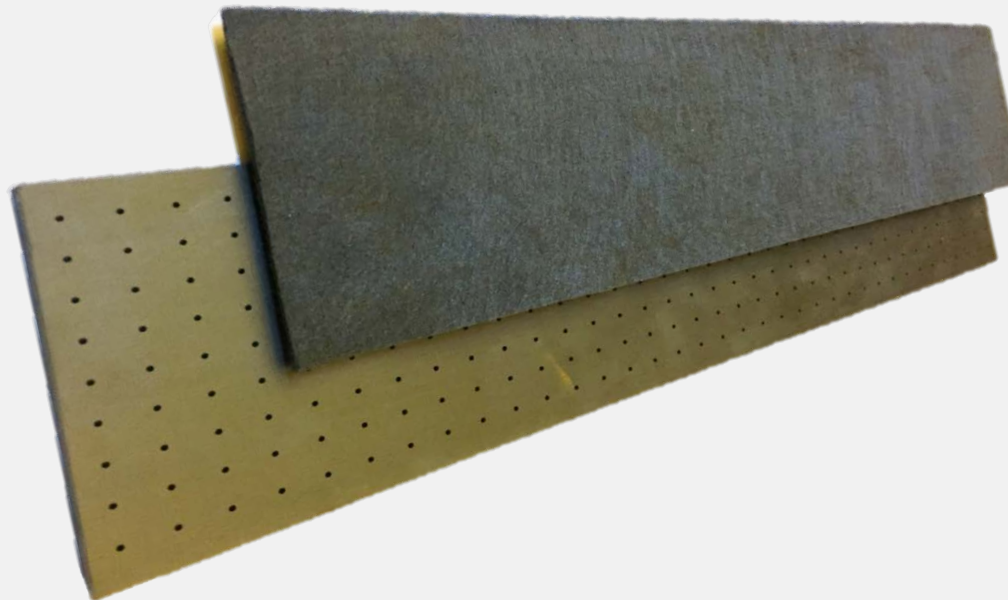


GREAT ROOM FOR TECHNOLOGICAL IMPROVEMENT

4 PCT APPLICATIONS with US Provisional priority

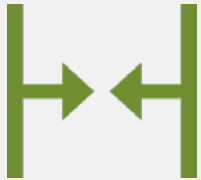


MULTIGRID™ is an innovative flow field that grants over 50% increase in power density

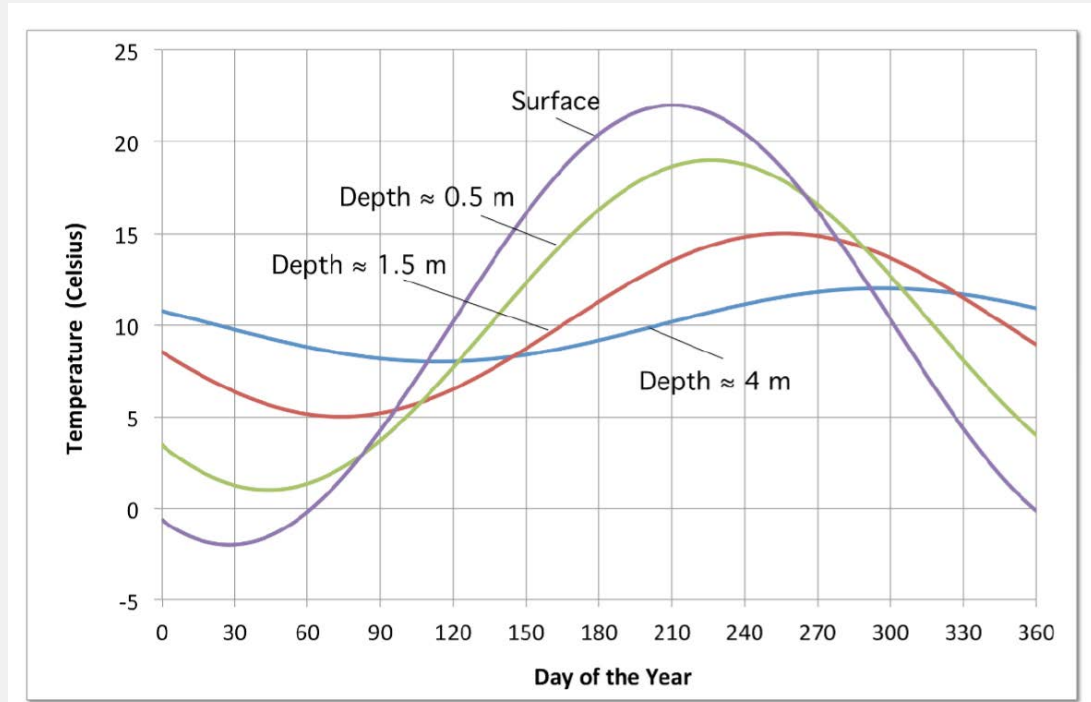




Why Vanadium Flow - Our IP



THERMASTABLE™ is an innovative geothermal design that increases the round-trip efficiency by about 5%. This makes our batteries ideal for harsh and torrid climates, and resilient in case of natural disaster.

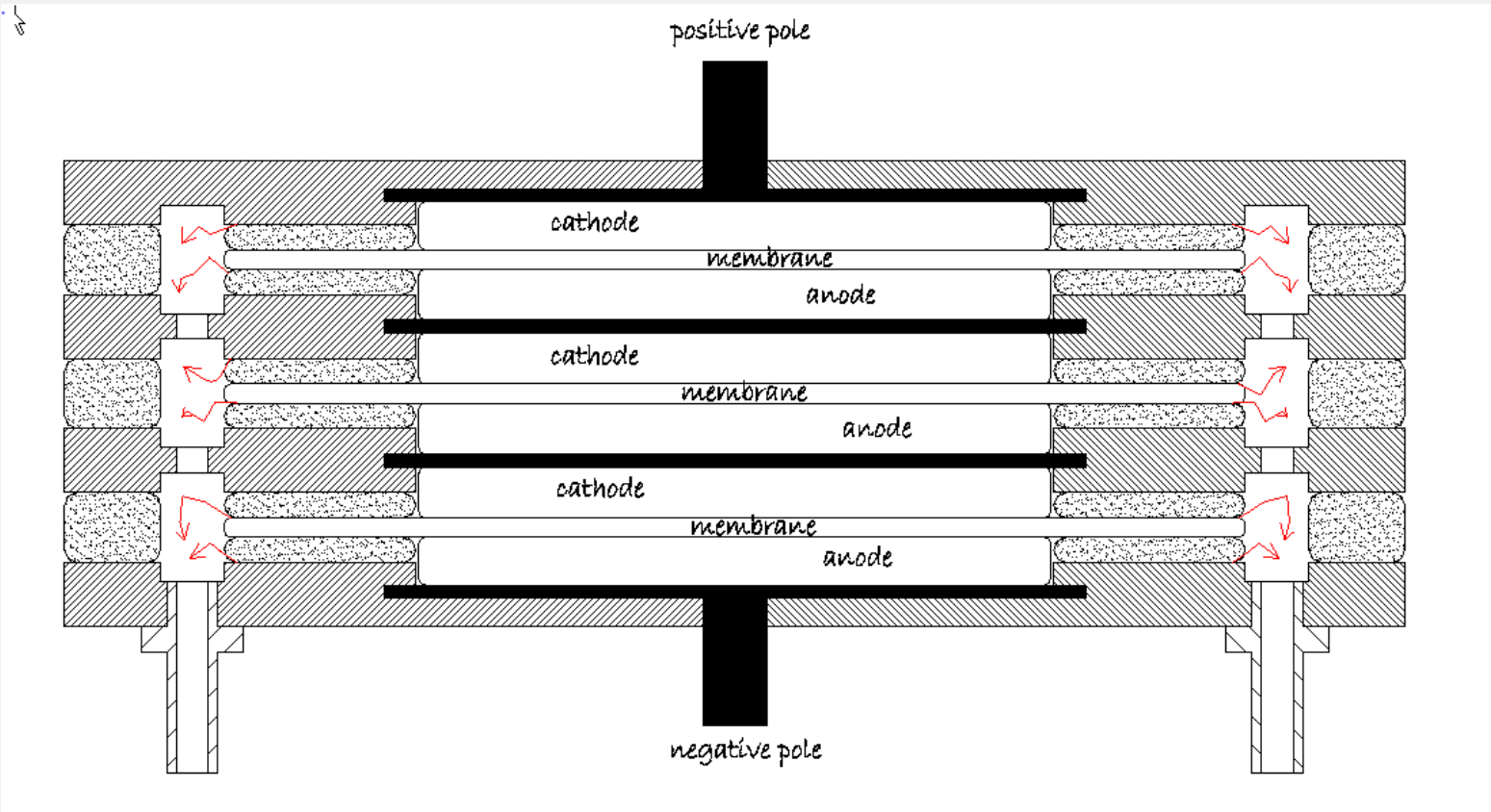




Why Vanadium Flow - Our IP



RESAFE™ is an innovative leak elimination system that eliminates periodic service inspections, thus reducing service costs.

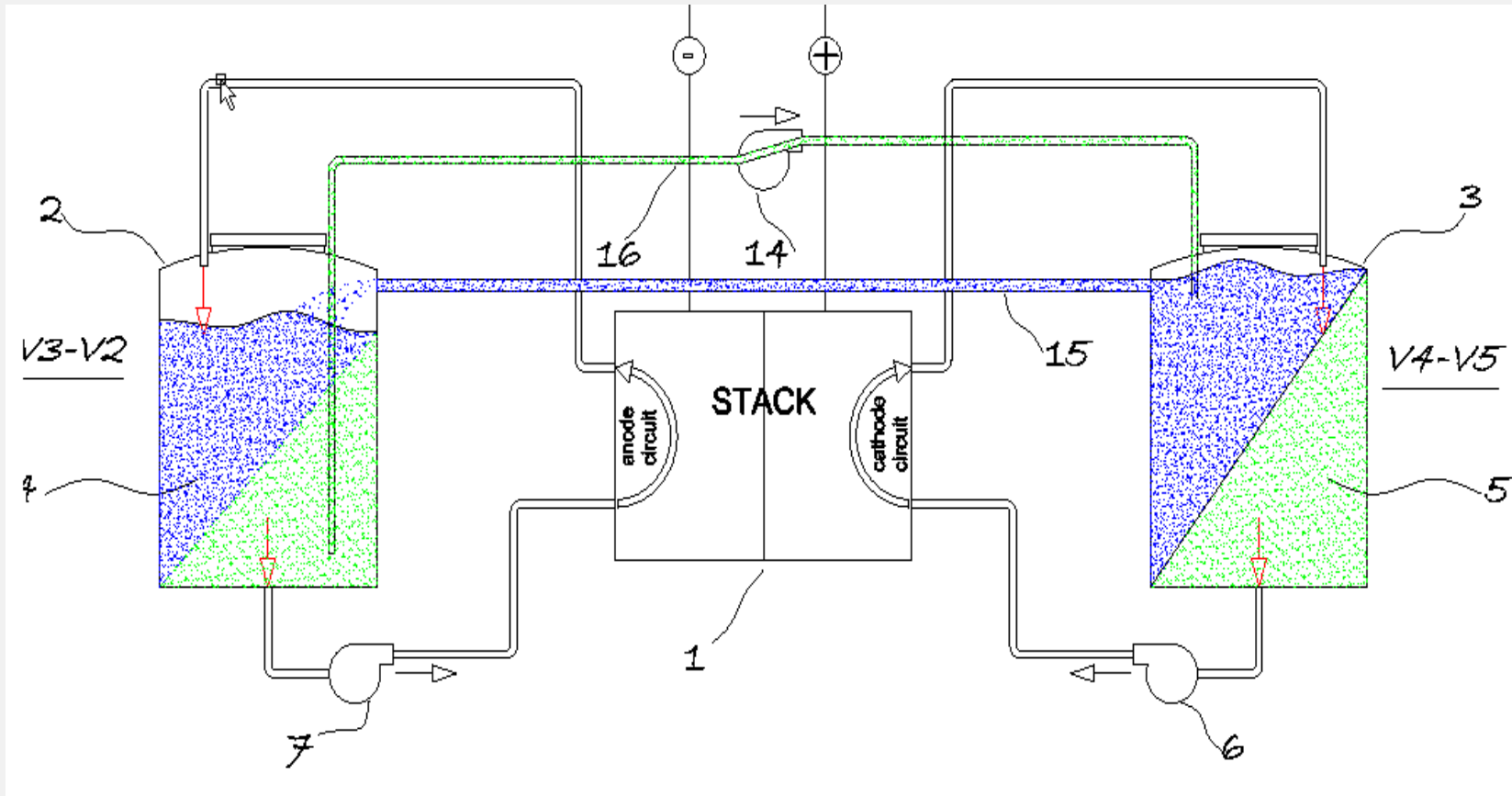




Why Vanadium Flow - Our IP



EQUILEVELS™ is an automatic method for electrolyte rebalancing that eliminates periodic inspections, thus reducing service costs.





StorEn signed a **BINDING MOU** with Multicom Resources, an Australian mining company. Thanks to this Agreement, StorEn secured the exclusive availability of vanadium for the next 10 years with a price cap.

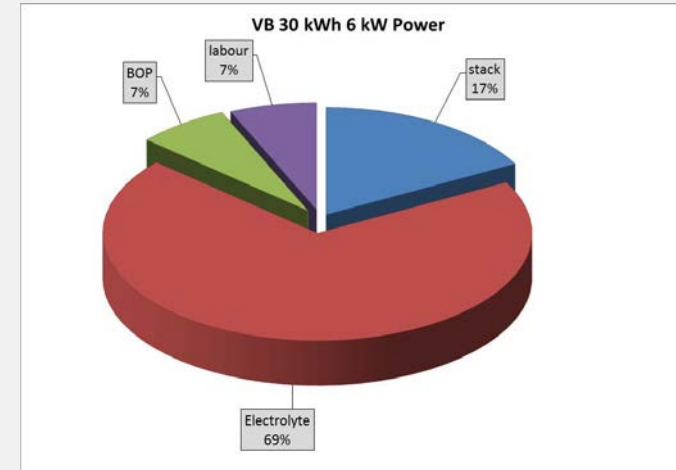
What About the Cost



Australia: residential forecast

StorEn's IP at the current components prices can reduce the manufacturing cost down to

\$133/kWh (70,000 unit p.a.)



Great scope for tech improvement - Future savings from:

- Larger manufacturing volumes e.g. like lithium
- Development of better performing components
- Economies of scale on the manufacturing of components

Hence, manufacturing cost could drop to **\$70/kWh**



Cost Reduction

- Performance increase > save on materials
- Elimination of servicing > reduced TCOs
- Reduction/optimization of components
- R&D effort > NYSERDA PONs; ARPA-E

Technology Switch

- Vanadium Flow has demonstrated fundamentals
- Going-concern Issue

Bankability

- Commercial financing e.g. leasing
- Product insurance > VIONX/New Energy Risk (August 2017)


Partnerships




NYSERDA



Multicom Resources PTY Ltd.
MOU to secure supplies of vanadium pentoxide. Multicom is an Australian Vanadium mining company.




Innovation by Chemistry
Toray Industries Inc.
Development program for carbon components for Vanadium Flow Batteries. Toray Industries is a leading Japanese multinational chemical group of companies. Toray operates in 26 countries and has a total of over 46,000 employees.



Development program for Vanadium Flow Batteries membranes. Chemours is a company of the Dupont Group of companies.



Environment Park Torino
Parco Scientifico Tecnologico per l'Ambiente
Testing program in cooperation with the team at the Environment and Science Park.



Rensselaer
Rensselaer Polytechnic Institute
Testing of innovative membranes in cooperation with the Chulsung Bae Research Group. Founded in 1824 in Troy NY, RPI, is a leading private university and research institution.

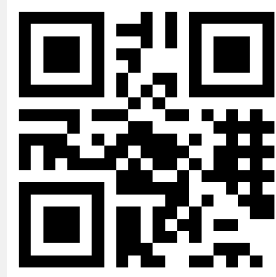


UNIVERSITÀ DEGLI STUDI DI PADOVA
The University of Padova
R&D program with the Guarnieri Research Group, Founded in 1222, is the world fifth-oldest surviving university in the world. 2016 ranked the best Italian university with over 40,000 students.

UIC
UNIVERSITY OF ILLINOIS AT CHICAGO
University of Illinois at Chicago
Testing of innovative membranes in cooperation with the Sangil Kim Research Group. UIC is a state-funded public research-intensive university located in Chicago, Illinois, United States.

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